PROPOSED GOODLANDS UNIT NO. 3

Application for Enhanced Oil Recovery Waterflood Project

Lower Amaranth Formation

Lower Amaranth I Pool (03 29I)

Waskada Field, Manitoba

October 28, 2016
Tundra Oil and Gas Partnership

INTRODUCTION

The Waskada Oil Field is located in Townships 1 and 2, Ranges 23-26 W1 (Figure 1). The Waskada Lower Amaranth Oil pool was discovered in June 1980 when Omega Hydrocarbons recompleted a former Mississippian producer in the stratigraphically higher Lower Member of the Amaranth Formation. Secondary recovery through waterflood has been initiated throughout much of the pool. Tundra Oil and Gas (Tundra) currently operates Waskada Lower Amaranth Unit 1, 2, 3, 4, 5, 6, 7, 8, 13, 14, 15, 16, 17, 18 and 19.

In the eastern part of the Waskada field, potential exists for incremental production and reserves from a Waterflood EOR project in the Lower Amaranth oil reservoirs. The following represents an application by Tundra to establish Goodlands Unit No. 3 (LSDs 1-14 Section 9, LSDs 1-6, 11-14 Section 10, LSDs 3-4 Section 11, LSDs 5-6, 11-16 Section 14 and LSDs 3-16 Section 15-001-24W1) and implement a Secondary Waterflood (WF) EOR scheme within the Lower Amaranth Formation as outlined on Figure 2.

The proposed project area falls within the existing designated 03-29A Lower Amaranth A Pool and 03-29I Lower Amaranth I Pool of the Waskada Oilfield (Figure 3).

SUMMARY

1. The proposed Goodlands Unit No. 3 will include 74 horizontal wells, 3 deviated wells and 35 vertical wells within 50 Legal Sub Divisions (LSD) of the Lower Amaranth producing reservoir. The project is located west of Goodlands Unit No. 1 (Figure 2).

2. Total Net Original Oil in Place (OOIP) in Goodlands Unit No. 3 has been calculated to be **6,130** e^3m^3 (38,559 Mbbl) for an average of **122.6 net e^3m^3 (**771.2 Mbbl) OOIP per 40 acre LSD.

3. Cumulative allocated production to the end of July 2016 from the 112 wells within the proposed Goodlands Unit No. 3 project area was **473.6** e^3m^3 (2,979 Mbbl) of oil, and **950.1** e^3m^3 (5,976 Mbbl) of water, representing a **7.7%** Recovery Factor (RF) of the Net OOIP.

4. Estimated Ultimate Recovery (EUR) of Primary Proved Producing oil reserves in the proposed Goodlands Unit No. 3 project area has been calculated to be **597.1** e^3m^3 (3,757 Mbbl), with **123.4** e^3m^3 (776.6 Mbbl) remaining as of the end of July 2016.

5. Ultimate oil recovery of the proposed Goodlands Unit No. 3 OOIP, under the current Primary Production method, is forecasted to be **9.7%.**

6. The production from the Goodlands Unit No. 3 peaked in September 2013 at 299.8 m^3 (OPD) as shown in Figure 4. As of July 2016, production was 64.0 m^3 OPD, 396.9 m^3 of water per day (WPD) and an 86.1% watercut.

7. In September 2013, production averaged 3.5 m^3 OPD per well in Goodlands Unit No. 3. As of July 2016, average per well production has declined to 0.9 m^3 OPD. Decline analysis of the group primary production data forecasts total oil to continue declining at an annual rate of approximately **30.0%** in the project area.

8. Estimated Ultimate Recovery (EUR) of proved oil reserves under Secondary WF EOR for the proposed Goodlands Unit No. 3 has been calculated to be **799.9** e^3m^3 **(5,033** Mbbl), with **326.3** e^3m^3 (**2,052** Mbbl) remaining. An incremental **202.8** e^3m^3 **(1,275** Mbbl) of proved oil reserves, or **3.3%**, are forecasted to be recovered under the proposed Unitization and Secondary EOR production vs the existing Primary Production method.

9. Total RF under Secondary EOR WF in the proposed Goodlands Unit No. 3 is estimated to be **13.0%**.

10. Based on the waterflood response in the adjacent main portion of the Waskada field, the Lower Amaranth Formation in the proposed project area is believed to be a suitable reservoir for WF EOR operations.

11. Existing horizontal wells, with multi-stage hydraulic fractures will be converted to injection to provide waterflood support to existing horizontal/vertical producing wells (Figure 5) within the proposed Goodlands Unit No. 3 to complete waterflood patterns.

Geology

Stratigraphy:

The Triassic aged Lower Amaranth formation is the oil producing reservoir that is the subject of this unit application. The stratigraphy of the reservoir section for the proposed unit is shown on the structural cross section attached as Appendix 1. The section runs N to S approximately through the mid-point of the proposed unit. The Lower Amaranth is bounded on top by the Amaranth Evaporite and by the Mississippian Unconformity at the base.

Stratigraphic nomenclature has been modeled after previous operator's (EOG Resources) conventions. The producing sequence in descending order consists of the Lower Amaranth A Unit, Lower Amaranth Green Sand, Lower Amaranth Blue Sand, Lower Amaranth Purple Sand, Lower Amaranth Brown Sand, Lower Amaranth Red Sand, and the Lower Amaranth Lower Sand. The reservoir units are primarily represented by the Green, Blue, Purple, Brown, and Red Sands. The Upper portion of the Lower Amaranth A unit is considered tight, and represents the top seal for the reservoir.

Sedimentology:

The Lower Amaranth reservoir units (top of Green through to base of Red Sand) comprise interlaminated shale, siltstone, and fine grained sandstone. The laminations tend to range from > 1 cm up to 20 cm in thickness, often show signs of scouring at the base of each laminae, and tend to fine upwards. There are anhydrite beds capping each sub-unit within the producing sequence; these anhydrite layers are generally correlatable over the entire Pierson / Waskada / Goodlands area. These anhydrite layers are the basis for the stratigraphic framework that is being used to describe the reservoir within the proposed unit.

The units within the producing sequence have very similar characteristics. Color tends to vary with grain size in that the finer grained material tends to be brick red, while the courser grained material generally tends to be grey to light brown. All of the sub units have a varying component of anhydrite cement, which will appear as mm sized nodules in heavily cemented areas. Finally, well rounded, floating, course, frosted quartz grains are common throughout the entire productive interval.

Lower Amaranth reservoir is interpreted as having been deposited in an arid tidal flat (Sabkha) setting. The stratigraphic divisions (Green, Blue, Purple, Brown, Red, and Lower Sands) are interpreted as representing individual evaporitic cycles, each exhibiting relatively higher depositional energy at the base, grading into very low energy towards the top.

Since each cycle is bound by an erosive surface on the top and bottom, there can be lateral variability in sediment preservation within each cycle. Occasional preservation of high angled cross stratification suggests periods of very high energy during deposition which are interpreted as channel deposits, which help support a tidal flat setting depositional model.

The Upper portion of the Upper Amaranth A unit is made up of brick red shale that is generally not bedded and does not tend to exhibit any sedimentary structures. It is a low permeability zone that represents the top seal to the Lower Amaranth reservoir.

The Lower Sand portion of the Lower Amaranth (immediately beneath the Red Sand), has a lot of the same characteristics as the productive interval, but tends to have much less effective porosity due to abundant anhydrite cement.

Structure:

Structure contour maps are provided for the top and base of the reservoir interval (Appendices 2 and 3). The reservoir units dip to the southwest, which is consistent with the regional dip. Structural mapping based on well control does not indicate the presence of large scale structural features that would indicate an increased risk of faulting within the proposed unit boundary.

Reservoir Continuity:

There are limited barriers to reservoir continuity that are apparent from the data available. Available data from well logs do not show any apparent lateral facies changes within the proposed unit that would result in significant lateral permeability barriers. An isopach map of the reservoir interval (Appendix 4) shows that the reservoir thickness remains consistent at about 10.0 meters.

Also, as mentioned above, there are no indications of any structural features that could set up any lateral permeability barriers within the proposed unit. The lack of lateral permeability barriers suggests this pool is well suited for secondary oil recovery.

Reservoir Quality:

Net pay determination within the proposed unit was done by using a sonic porosity cut off. There are a number of steps that were undertaken in order to determine net pay from sonic log data:

- Core data from the entire Waskada / Goodlands area (Appendix 5) was used to determine a relationship between porosity and permeability. Based on a best fit line through the available core analysis it was determined that a core porosity of 10% represents 0.5 md of permeability (Appendix 6).
- Sonic porosity was calculated for wells in which digital sonic data was available (Appendix 7) using the following formula:

$$Sonic\ Porosity = \frac{Dt - Dtmatrix}{Dtwater - Dtmatrix}$$

Where

Dt = Sonic travel time (ms/m)

Dt_{matrix} = Sonic travel time of the rock matrix (198 ms/m)

Dt_{water} = Sonic travel time of the formation water (681 ms/m)

- In order to translate this relationship to well logs, a comparison between sonic porosity and core porosity was undertaken. A total of 52 wells were found in the Waskada / Goodlands area that had digital sonic curves along with core analysis over the Lower Amaranth reservoir interval (Appendix 8). Sonic porosity from logs was compared to core porosity from core analysis (Appendix 9) and the data suggests that there is a good relationship between porosity from core and porosity from Sonic data.

From this relationship, a sonic log porosity cut of 10% was used as a pay determination for each logged well. In this way, the porosity / permeability relationship as determined from core can be translated into wells where there is log data available. In turn, this increases the control points for OOIP determination, which increases the resolution of OOIP mapping.

OOIP Estimates

OOIP values were calculated using the following volumetric equation:

$$OOIP = \frac{Area * Net\ Pay * \ Porosity * (1 - Water\ Saturation)}{Initial\ Formation\ Volume\ Factor\ of\ Oil}$$

or

$$OOIP(m3) = \frac{A * h * \emptyset * (1 - Sw)}{Bo} * \frac{10{,}000m2}{ha}$$

or

$$OOIP(Mbbl) = \frac{A * h * \emptyset * (1 - Sw)}{Bo} * 3.28084\frac{ft}{m} * 7{,}758.367\frac{bbl}{acre * ft} * \frac{1Mbbl}{1{,}000bbl}$$

where

OOIP	= Original Oil in Place by LSD (Mbbl, or m3)
A	= Area (40acres, or 16.187 hectares, per LSD)
h * Ø	= Net Pay * Porosity, or Phi * h (ft, or m)
Bo	= Formation Volume Factor of Oil (stb/rb, or sm3/rm3)
Sw	= Water Saturation (decimal)

For the purposes of this unit application, Bo and Sw were held constant at 1.17 and 40% respectively. The initial oil formation volume factor was adopted from a PVT taken from the 8-26-1-26W1, thought to be representative of the fluid characteristics in the reservoir. Sw determination was set at 40% based on analysis of capillary pressure data from six different locations in the Waskada / Goodlands area (6-21-1-25W1, 7-28-1-25W1, 13-10-1-24W1, 15-1-1-25W1, and 14-14-2-25W1).

Average sonic porosity for the proposed Unit area has been included as Appendix 10.

Phi * h maps were created from sonic porosity log data (Appendix 11). The average phi * h value within each LSD was calculated using IHS Petra software, this provided the final input into the OOIP calculation.

Total volumetric OOIP for the Lower Amaranth within the proposed unit has been calculated to be 6,130 e^3m^3 (38,559 Mbbls). Tabulated parameters for each LSD from the calculations can be found in Table 4.

Original Oil in Place (OOIP) calculations and geologic summary were prepared by Todd Neely and reviewed by Bill Ward, P. Geologist.

Historical Production

A historical group production history plot for the proposed Goodlands Unit No. 3 is shown as Figure 4. Oil production commenced from the proposed Unit area in January 1997 and peaked during September 2013 at 299.8 m^3 OPD. As of April 2016, production was 85.0 m^3 OPD, 395.2 m^3 of water per day (WPD) and an 82.3% watercut.

From peak production in September 2013 to date, oil production is declining at an annual rate of approximately **30%** under the current Primary Production method.

The remainder of the field's production and decline rates indicate the need for pressure restoration and maintenance. Waterflooding is deemed to be the most efficient means of secondary recovery to introduce energy back into the system and provide a real sweep between wells.

UNITIZATION

Unitization and implementation of a Waterflood EOR project is forecasted to increase overall recovery of OOIP from the proposed project area.

Unit Name

Tundra proposes that the official name of the new Unit shall be Goodlands Unit No. 3.

Unit Operator

Tundra Oil and Gas Partnership (Tundra) will be the Operator of record for Goodlands Unit No. 3.

Unitized Zone

The Unitized zone(s) to be waterflooded in the Goodlands Unit No. 3 will be the Lower Amaranth formation.

Unit Wells

The 74 horizontal wells, 3 deviated wells and 35 vertical wells to be included in the proposed Goodlands Unit No. 3 are outlined in Table 3.

Unit Lands

The Goodlands Unit No. 3 will consist of 50 LSDs as follows:

LSDs 1-14 Section 9 of Township 1, Range 24, W1M
LSDs 1-6, 11-14 Section 10 of Township 1, Range 24, W1M
LSDs 3-4 Section 11 of Township 1, Range 24, W1M
LSDs 5-6, 11-16 Section 14 of Township 1, Range 24, W1M
LSDs 3-16 Section 15 of Township 1, Range 24, W1M

The lands included in the 40 acre tracts are outlined in Table 1.

Tract Factors

The proposed Goodlands Unit No. 3 will consist of 50 Tracts based on the 40 acre LSDs containing the existing 74 horizontal, 3 deviated and 35 vertical wells.

The Tract Factor contribution for each of the LSD's within the proposed Goodlands Unit No. 3 was calculated as follows:

- Gross OOIP by LSD, minus cumulative production to date for the LSD as distributed by the LSD specific Production Allocation (PA) % in the applicable producing horizontal or vertical well (to yield Remaining Gross OOIP)

- Last twelve (12) months production to date for the LSD as distributed by the LSD specific PA % in the applicable producing horizontal or vertical well.
- Tract Factor by LSD = Fifty percent (50%) of the product of Remaining Gross OOIP by LSD as a % of total proposed Unit Remaining Gross OOIP, and fifty percent (50%) of the product of the Last 12 Months Production as a % of total proposed Unit Last 12 Months Production.

Tract Factor calculations for all individual LSDs based on the above methodology are outlined within Table 2. In the past, multiple methods of assigning tract participation factors have been used in the Waskada area. Tundra believes that the above given method provides the most equitable assignment of tract participation factors to all mineral owners, given the geological, reservoir and well completion risks associated with waterflooding horizontal to horizontal wellbores in Lower Amaranth formation.

Working Interest Owners

Table 1 outlines the working interest (WI) for each recommended Tract within the proposed Goodlands Unit No. 3. Tundra Oil and Gas Partnership holds a 100% WI ownership in all the proposed Tracts.

Tundra Oil and Gas Partnership will have a 100% WI in the proposed Goodlands Unit No. 3.

WATERFLOOD EOR DEVELOPMENT

Technical Studies

The waterflood performance predictions for the proposed Goodlands Unit No. 3 Lower Amaranth project are based on internal engineering assessments, as well as empirically observed waterflood performance in nearby Waskada Units 16 and 17, which employed a vertical to vertical waterflood. Utilizing project area specific reservoir and geological parameters, a Black oil simulation model using Exodus software was created by Tundra to evaluate the potential waterflood response using horizontal injectors to flood horizontal producers, which is the configuration that Tundra proposes in Goodlands Unit No. 3. While the model was created using geological and historical production data from Waskada Unit 19, in section 34-1-25W1, the results observed in the model were similar to those observed empirically in Units 16 and 17, and deemed representative of what Tundra would expect in Goodlands Unit 3.

Horizontal Injection Wells and EOR Development

Primary production from the original vertical/horizontal producing wells in the proposed Goodlands Unit No. 3 has declined significantly from peak rate indicating a need for secondary pressure support. Through the process of developing similar waterfloods, Tundra has measured a significant variation in reservoir pressure depletion by the existing primary producing wells. Placing new horizontal wells immediately on water injection in areas without significant reservoir pressure depletion has been problematic in similar low permeability formations, and has a negative impact on the ultimate total recovery of oil.

Tundra proposes to convert up to 29 horizontal producing wells to water injection wells (WIW) over a 3 year period, as shown in Figure 5. This conversion scheme would allow for approximately 30 acre effective spacing between offsetting injection wells. Alternative injection configurations may be considered depending on results from offset pilot areas in the Lower Amaranth formation, within the Waskada field. These configurations could result in the conversion of more or less wells to injection than what is shown in Figure 5. Additionally, new horizontal injectors may be considered to be drilled if they are deemed to be essential to improving recovery in the unit. If new injection wells are drilled in this area, Tundra believes an initial period of producing all new horizontal wells prior to placing them on permanent water injection is essential and all Unit mineral owners will benefit.

Tundra will continue to monitors reservoir pressure, fluid production and decline rates in each pattern to determine when the well will be converted to water injection.

Reserves Recovery Profiles and Production Forecasts

The primary waterflood performance predictions for the proposed Goodlands Unit No. 3 are based on oil production decline curve analysis. The secondary predictions are based primarily on internal engineering analysis performed by the Tundra reservoir engineering group, utilizing an Exodus simulation model generated in Waskada Unit 19 (described previously), and simulating horizontal injectors offsetting horizontal producers for waterflood development. These results were then compared and contrasted to empirically observed data in Waskada Unit 16 and 17 to ensure proper calibration of data and results.

Primary Production Forecast

Cumulative allocated production in the Goodlands Unit No. 3 project area, to the end of July 2016 from 112 wells, was 473.6 e^3m^3 of oil and 950.1 e^3m^3 of water for a recovery factor of **7.7%** of the calculated Net OOIP.

Ultimate Primary Proved Producing oil reserves recovery for Goodlands Unit No. 3 has been estimated to be **597.1** e^3m^3, or a **9.7**% Recovery Factor (RF) of OOIP. Remaining Producing Primary Reserves has been estimated to be **123.4** e^3m^3 to the end of July 2016.

The expected production decline and forecasted cumulative oil recovery under continued Primary Production is shown in Figures 7 and 8.

Pre-Production Schedule/Timing for Conversion of Horizontal Wells to Water Injection

Tundra proposes to implement an initial phase which consists of 8 Horizontal conversions throughout 2017 to test the efficiency of the Goodlands Unit No. 3 Waterflood.

Criteria for Conversion to Water Injection Well

Tundra will monitor the following parameters to assess the best timing for each individual horizontal well to be converted from primary production to water injection service.

- Measure reservoir pressures through primary production
- Fluid production rates and any changes in decline rate
- Any observed production interference effects with adjacent vertical and horizontal wells
- Pattern mass balance and/or oil recovery factor estimates
- Reservoir pressure relative to bubble point pressure

The above schedule allows for the proposed Goodlands Unit No. 3 project to be developed equitably, efficiently, and moves the project to the best condition for the start of waterflood as quickly as possible. It also provides the Unit Operator flexibility to manage the reservoir conditions and response to help ensure maximum ultimate recovery of reserves.

Secondary EOR Production Forecast

The proposed project oil production profile under Secondary Waterflood has been developed based on the response observed to date in Waskada Unit 16 and 17, as well as internal Black Oil Simulation model of section 34-1-25W1 in Waskada 19, which simulates a horizontal to horizontal waterflood. (Figure 6).

Secondary Waterflood plots of the expected oil production forecast over time and the expected oil production vs. cumulative oil are plotted in Figures 9 and 10, respectively. Total Secondary EUR for the proposed Goodlands Unit No. 3 is estimated to be **799.9** e^3m^3 with **326.3** e^3m^3 remaining representing a total secondary recovery factor of **13.0%** for the proposed Unit area. An incremental **202.8** e^3m^3 of oil, or a **3.3%** recovery factor, are forecasted to be recovered under the proposed Unitization and Secondary EOR production scheme vs. the existing Primary Production method.

Estimated Fracture Pressure

Completion data from the existing producing wells within the project area indicate an actual fracture pressure gradient range of 17.0 to 18.0 kPa/m true vertical depth (TVD).

WATERFLOOD OPERATING STRATEGY

Water Source

The injection water for the proposed Goodlands Unit No. 3 will be supplied from the existing Goodlands 16-10-001-24W1 Battery source and injection water system. All injection water will be obtained from the Swan River formation in the 100/04-15-001-24W1 well, which Tundra intends to have licensed as a water source well. Swan River water from the source well is pumped to an injection facility at 16-10-001-24W1, filtered, and pumped up to injection system pressure. A diagram of the Goodlands water injection system and new pipeline connection to the proposed Goodlands Unit No. 3 project area injection wells is shown as Figure 11.

Based on past experience, Tundra does not believe that the produced water can be cleaned to the required specifications feasibly. Therefore, Tundra plans to use source water from a Swan River well as a source supply for Goodlands Unit No. 3.

A mixture of produced waters from the Lower Amaranth has been extensively tested for compatibility with 100/05-09-001-25W1 source Swan River water (which is expected to be of similar composition to the 100/04-15-001-24W1 source water well), by a highly qualified third party, prior to implementation by Tundra. All potential mixture ratios between the two waters, under a range of temperatures, have been simulated and evaluated for scaling and precipitate producing tendencies. Testing of multiple scale inhibitors has also been conducted and minimum inhibition concentration requirements for the source water volume determined. Continuous scale inhibitor application will be maintained into the source water stream out of the Goodlands injection water facility, as it is in our neighboring Waskada facilities. Review and monitoring of the source water scale inhibition system is also part of an existing routine maintenance program.

Injection Wells

New water injection wells for the proposed Goodlands Unit No. 3 will be cleaned out and configured downhole for injection as shown in Figure 12. The horizontal injection well will be stimulated by multiple hydraulic fracture treatments to obtain suitable injection. Tundra has extensive experience with horizontal fracturing in the area, and all jobs are rigorously programmed and monitored during execution. This helps ensure optimum placement of each fracture stage to prevent, or minimize, the potential for out-of-zone fracture growth and thereby limit the potential for future out-of-zone injection.

The new water injection wells will be placed on injection after the pre-production period and approval to inject. Wellhead injection pressures will be maintained below the least value of either:

- the area specific known and calculated fracture gradient, or
- the licensed surface injection Maximum Allowable Pressure (MOP)

Tundra has a thorough understanding of area fracture gradients. A management program will be utilized to set and routinely review injection target rates and pressures vs. surface MOP and the known area formation fracture pressures.

All new water injection wells are surface equipped with injection volume metering and rate/pressure control. An operating procedure for monitoring water injection volumes and meter balancing will also be utilized to monitor the entire system measurement and integrity on a daily basis.

The proposed Goodlands Unit No. 3 horizontal water injection well rate is forecasted to average **10 - 30** m^3 WPD, based on expected reservoir permeability and pressure.

Reservoir Pressure

No representative initial pressure surveys are available for the proposed Goodlands Unit No. 3 project area in the Lower Amaranth producing zone. Tundra assumed operatorship of these properties in late 2015 and has been unable to recover any pressure surveys from the original operators.

Reservoir Pressure Management during Waterflood

Tundra expects it will take 2-4 years to re-pressurize the reservoir due to cumulative primary production voidage and pressure depletion. Initial monthly Voidage Replacement Ratio (VRR) is expected to be approximately 1.25 to 2.00 within the patterns during the fill up period. As the cumulative VRR approaches 1, target reservoir operating pressure for waterflood operations will be 75-90% of original reservoir pressure.

Waterflood Surveillance and Optimization

Goodlands Unit No. 3 EOR response and waterflood surveillance will consist of the following:

- Regular production well rate and WCT testing
- Daily water injection rate and pressure monitoring vs target
- Water injection rate/pressure/time vs. cumulative injection plot
- Reservoir pressure surveys as required to establish pressure trends
- Pattern VRR
- Potential use of chemical tracers to track water injector/producer responses
- Use of some or all of: Water Oil Ratio (WOR) trends, Log WOR vs Cum Oil, Hydrocarbon Pore Volumes Injected, Conformance Plots

The above surveillance methods will provide an ever increasing understanding of reservoir performance, and provide data to continually control and optimize the Goodlands Unit No. 3 waterflood operation. Controlling the waterflood operation will significantly reduce or eliminate the potential for out-of-zone injection, undesired channeling or water breakthrough, or out-of-Unit migration. The monitoring and surveillance will also provide early indicators of any such issues so that waterflood operations may be altered to maximize ultimate secondary reserves recovery from the proposed Goodlands Unit No. 3.

On Going Reservoir Pressure Surveys

Any pressures taken during the operation of the proposed unit will be reported within the Annual Progress Reports for Goodlands Unit No. 3 as per Section 73 of the Drilling and Production Regulation.

Economic Limits

Under the current Primary recovery method, existing wells within the proposed Goodlands Unit No. 3 will be deemed uneconomic when the net oil rate and net oil price revenue stream becomes less than the current producing operating costs. With any positive oil production response under the proposed Secondary recovery method, the economic limit will be significantly pushed out into the future. The actual economic cut off point will then again be a function of net oil price, the magnitude and duration of production rate response to the waterflood, and then current operating costs. Waterflood projects generally become uneconomic to operate when Water Oil Ratios (WOR's) exceed 100.

WATER INJECTION FACILITIES

The Goodlands Unit No. 3 waterflood operation will utilize the existing Tundra operated source well supply and water plant (WP) facilities located at 16-10-001-25 W1M Battery. Injection wells will be connected to the existing high pressure water pipeline system supplying other Tundra-operated Waterflood Units.

A complete description of all planned system design and operational practices to prevent corrosion related failures is shown in Figure 13.

NOTIFICATION OF MINERAL AND SURFACE RIGHTS OWNERS

Tundra is in the process of notifying all mineral rights and surface rights owners of this proposed EOR project and formation of Goodlands Unit No. 3. Copies of the notices and proof of service, to all surface and mineral rights owners will be forwarded to the Petroleum Branch when available to complete the Goodlands Unit No. 3 Application.

Goodlands Unit No. 3 Unitization, and execution of the formal Goodlands Unit No. 3 Agreement by affected Mineral Owners, is expected during Q1 2017. Copies of same will be forwarded to the Petroleum Branch, when available, to complete the Goodlands Unit No. 3 Application.

Should the Petroleum Branch have further questions or require more information, please contact Jennifer Abel at 204.748.4427 or by email at jennifer.abel@tundraoilandgas.com.

TUNDRA OIL & GAS PARTNERSHIP

Original Signed by Jennifer Abel, October 28, 2016, in Virden, AB

Proposed Goodlands Unit No. 3

Application for Enhanced Oil Recovery Waterflood Project

List of Figures

Figure No. 1

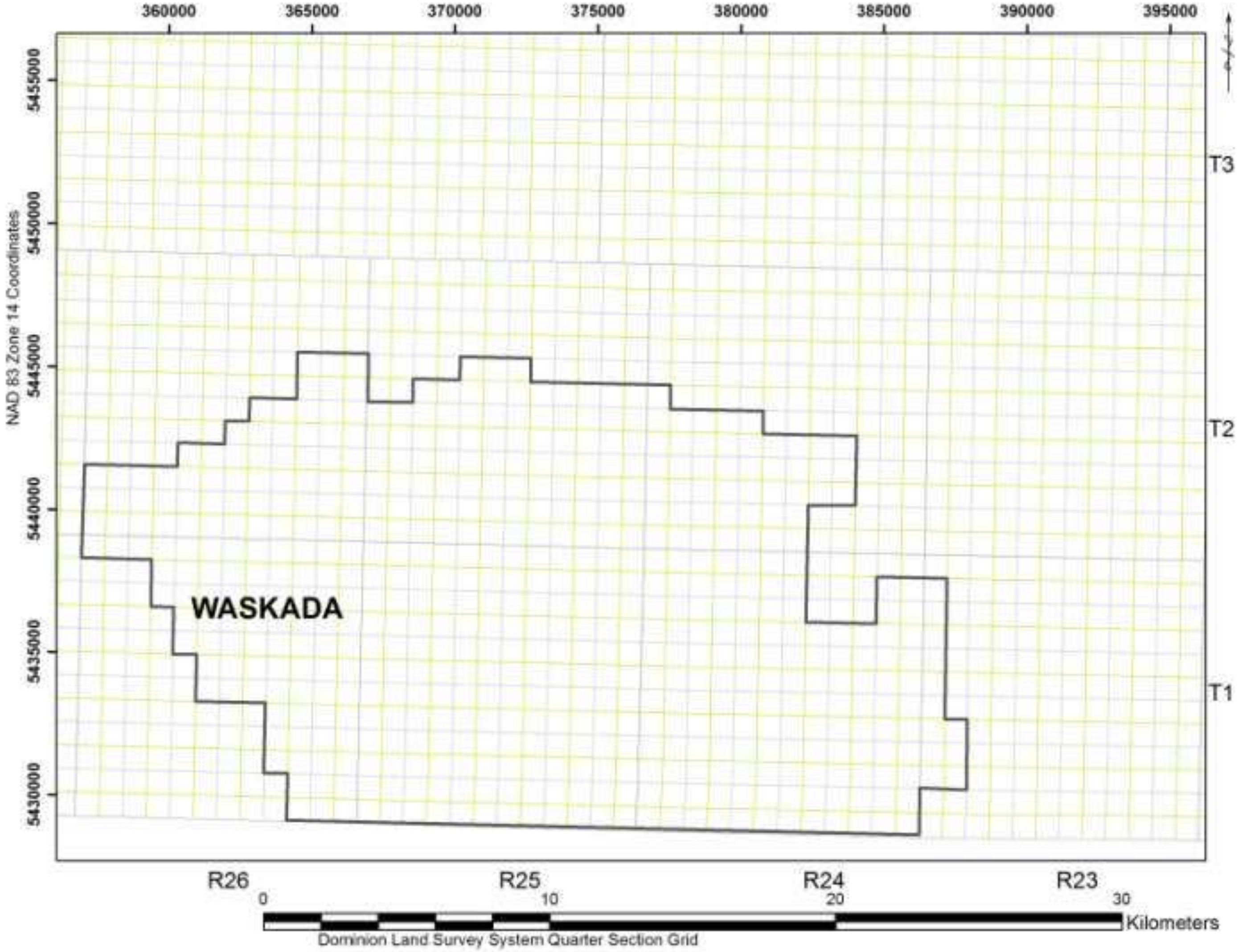

Figure 4 - Waskada Field (03)

Figure No. 2

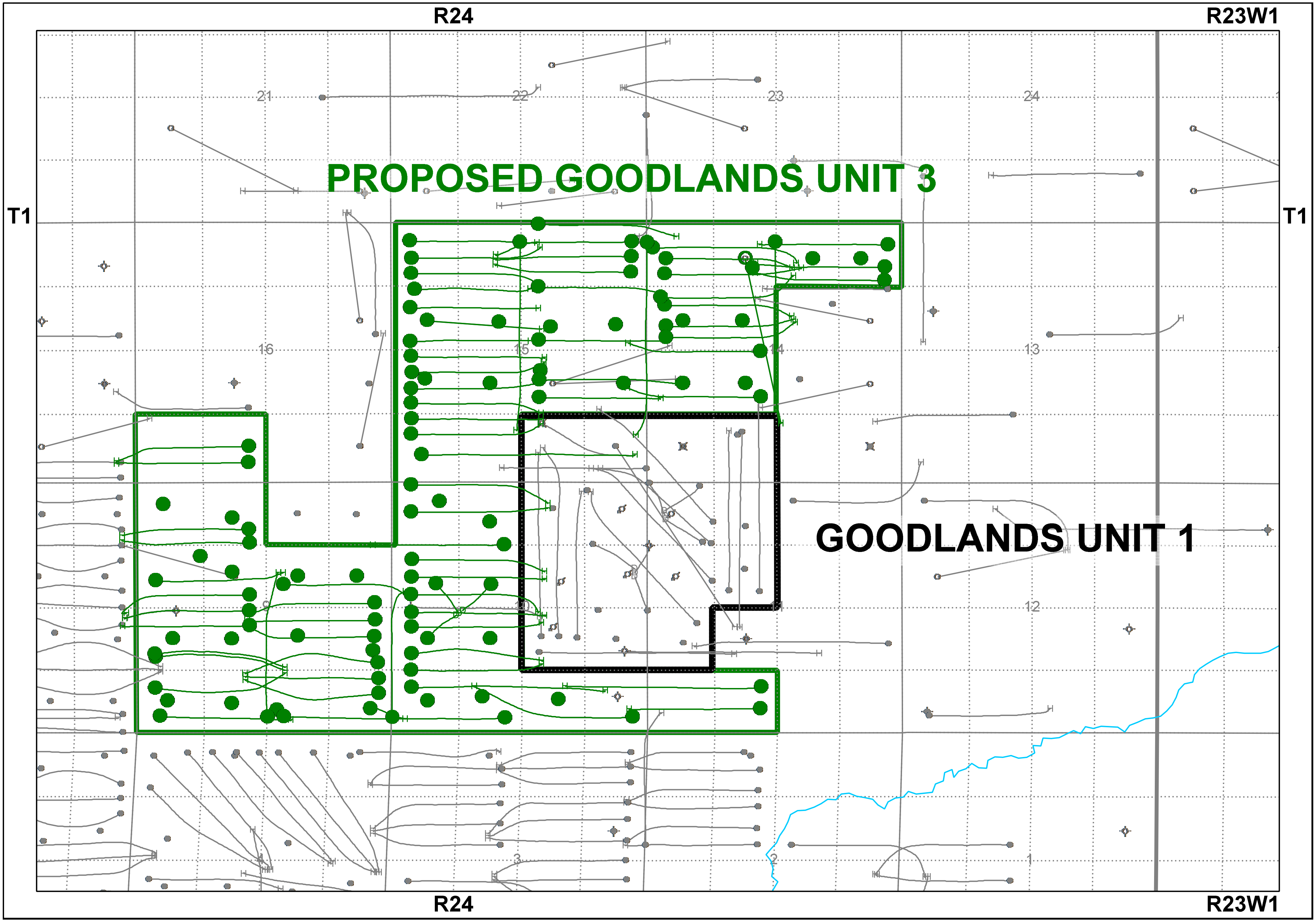

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Figure No. 3

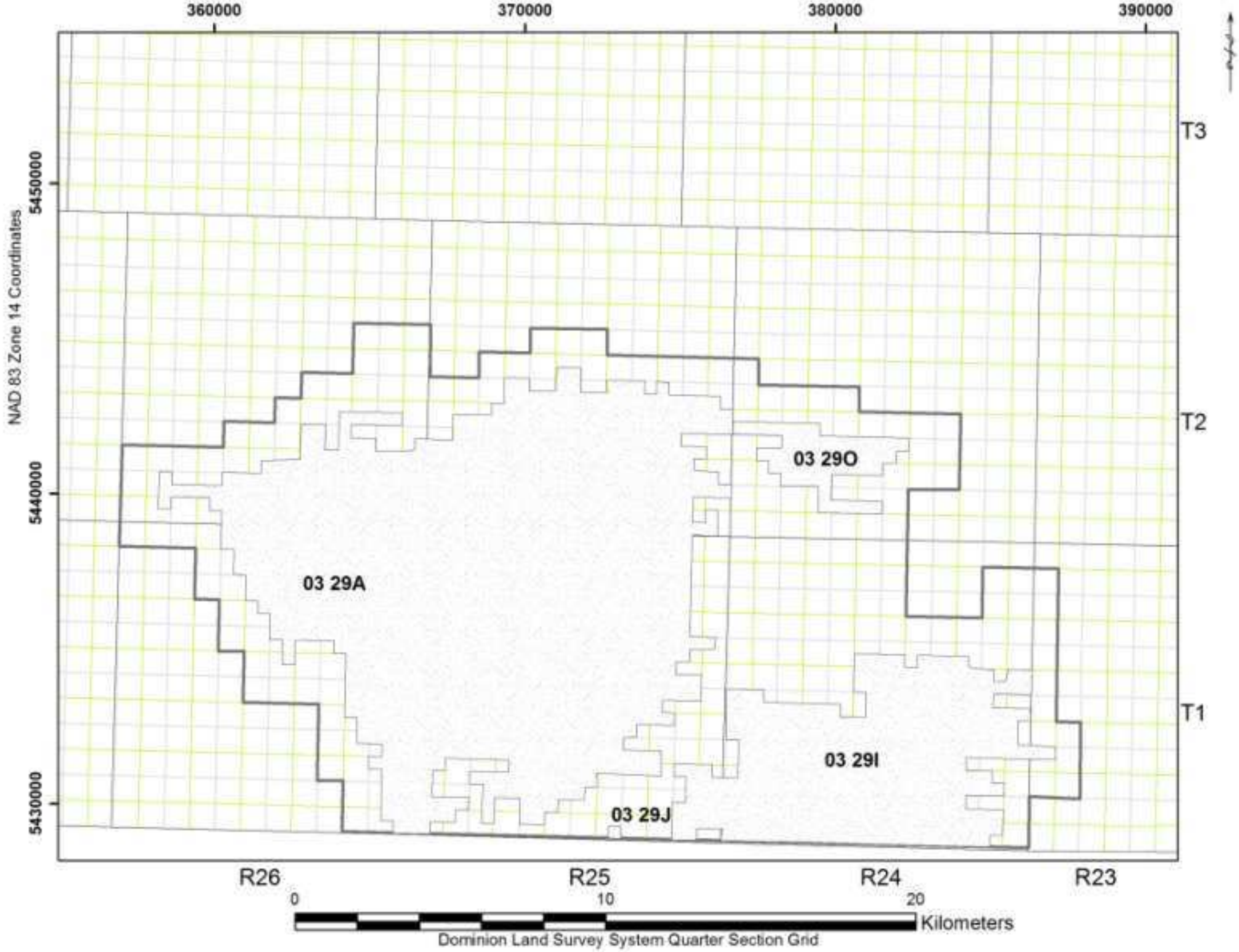


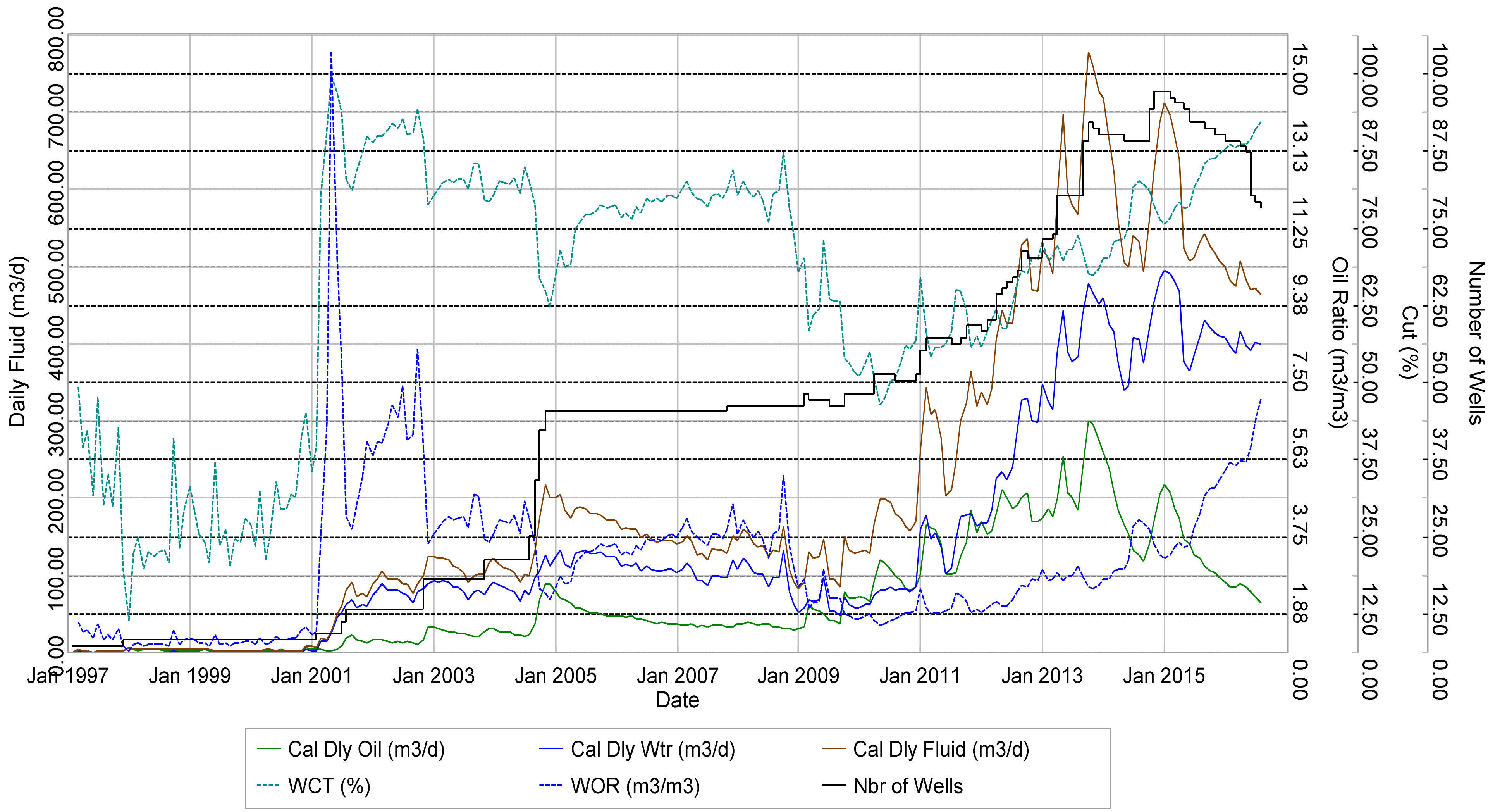
Figure 18 - Waskada Lower Amaranth Pools (03 29A, I, J, K & O)

Figure No. 4

Well Information as of 10/6/2016 - Group Well Report

Production Graph

Group:	113 wells	**On Prod:**	1997-01 to 2016-07	**Cum Oil:**	487018.3 m3
# of Wells:	113	**Prod Form:**	AMRNTHL; AMRNTH	**Cum Gas:**	13534.8 E3m3
Fluid:	Oil	**Field:**	WASKADA (3)	**Cum Wtr:**	1015839.5 m3
Mode:	Producing; Pumping; Abandoned Zone	**Pool Code:**	29I	**Cum Inj Oil:**	0.0 m3
		Unit Code:		**Cum Inj Gas:**	0.0 E3m3
				Cum Inj Wtr:	0.0 m3



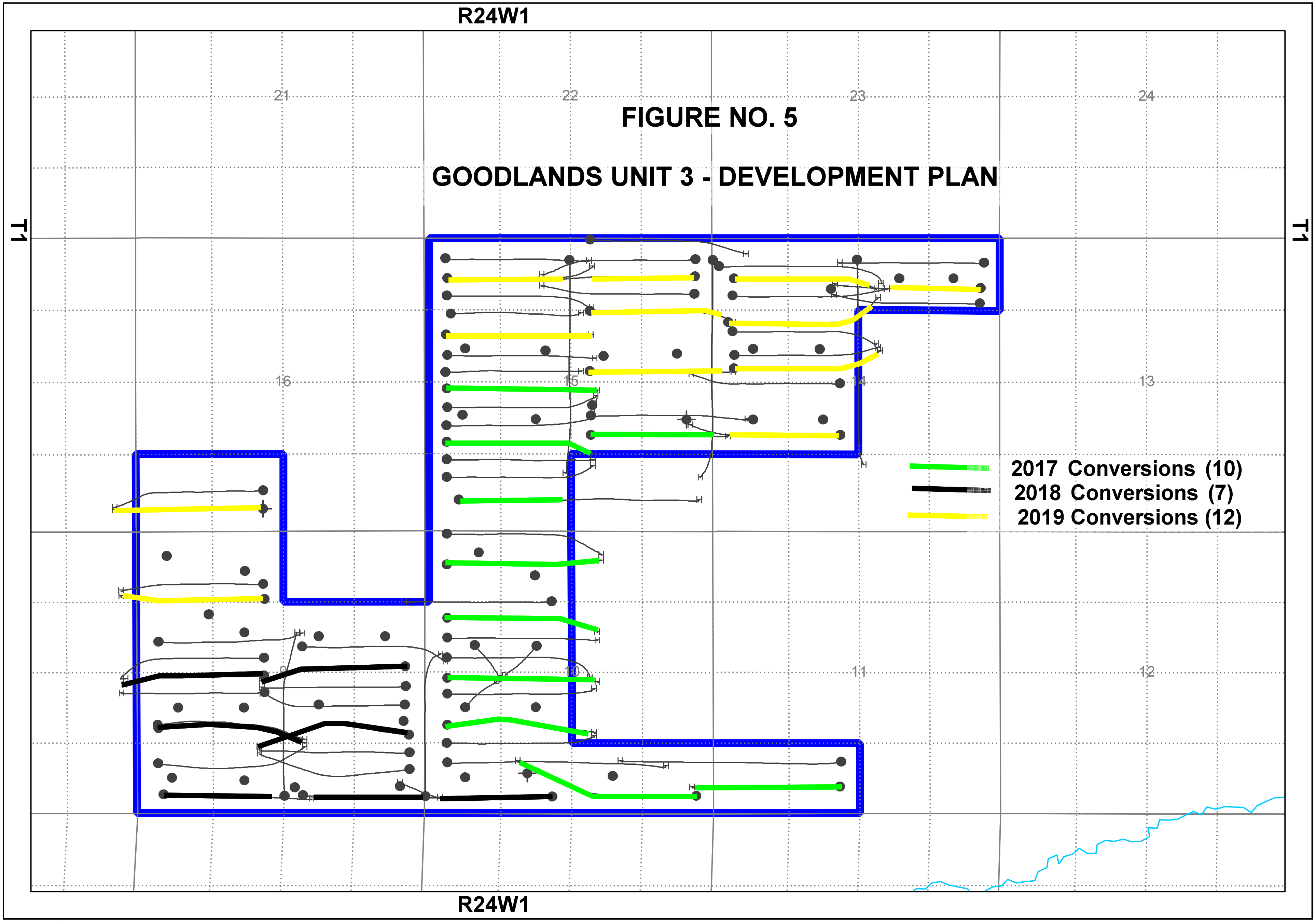


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Figure No. 6a

Well Information as of 12/4/2015 - Group Well Report

Production Graph

Group:	waskada unit 16.lwell	**Prod Form:**	AMRNTHL; WINNPGS	**On Prod:**	1984-07 to 2015-08
# of Wells:	69	**Field:**	WASKADA (3)	**Cum Oil:**	537510.3 m3
Fluid:	Oil; Water Injection; Salt Water	**Pool Code:**	29A; 76	**Cum Gas:**	2169.9 E3m3
Mode:	Producing; Injection; Abandoned Zone; Pumping; Disposal	**Unit Code:**	329A16; 329A17	**Cum Wtr:**	408882.7 m3

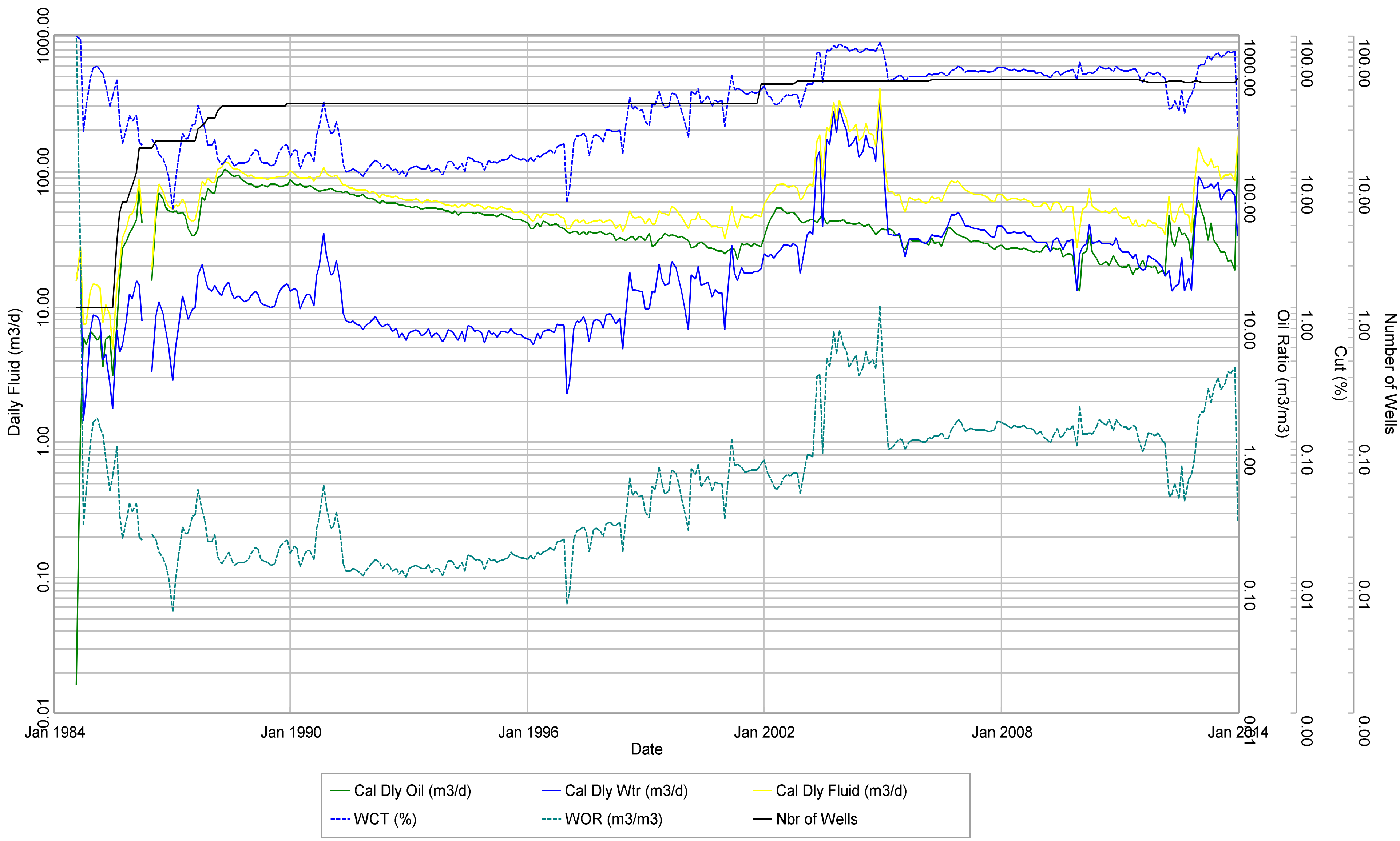


Figure No. 6b

Well Information as of 12/4/2015 - Group Well Report

Production Graph

Group:	waskada unit 17.lwell	**Prod Form:**	AMRNTHL	**On Prod:**	1986-01 to 2015-08
# of Wells:	41	**Field:**	WASKADA (3)	**Cum Oil:**	270643.6 m3
Fluid:	Oil; Water Injection	**Pool Code:**	29A	**Cum Gas:**	1105.9 E3m3
Mode:	Producing; Pumping; Injection; Abandoned Zone	**Unit Code:**	329A17	**Cum Wtr:**	178020.3 m3

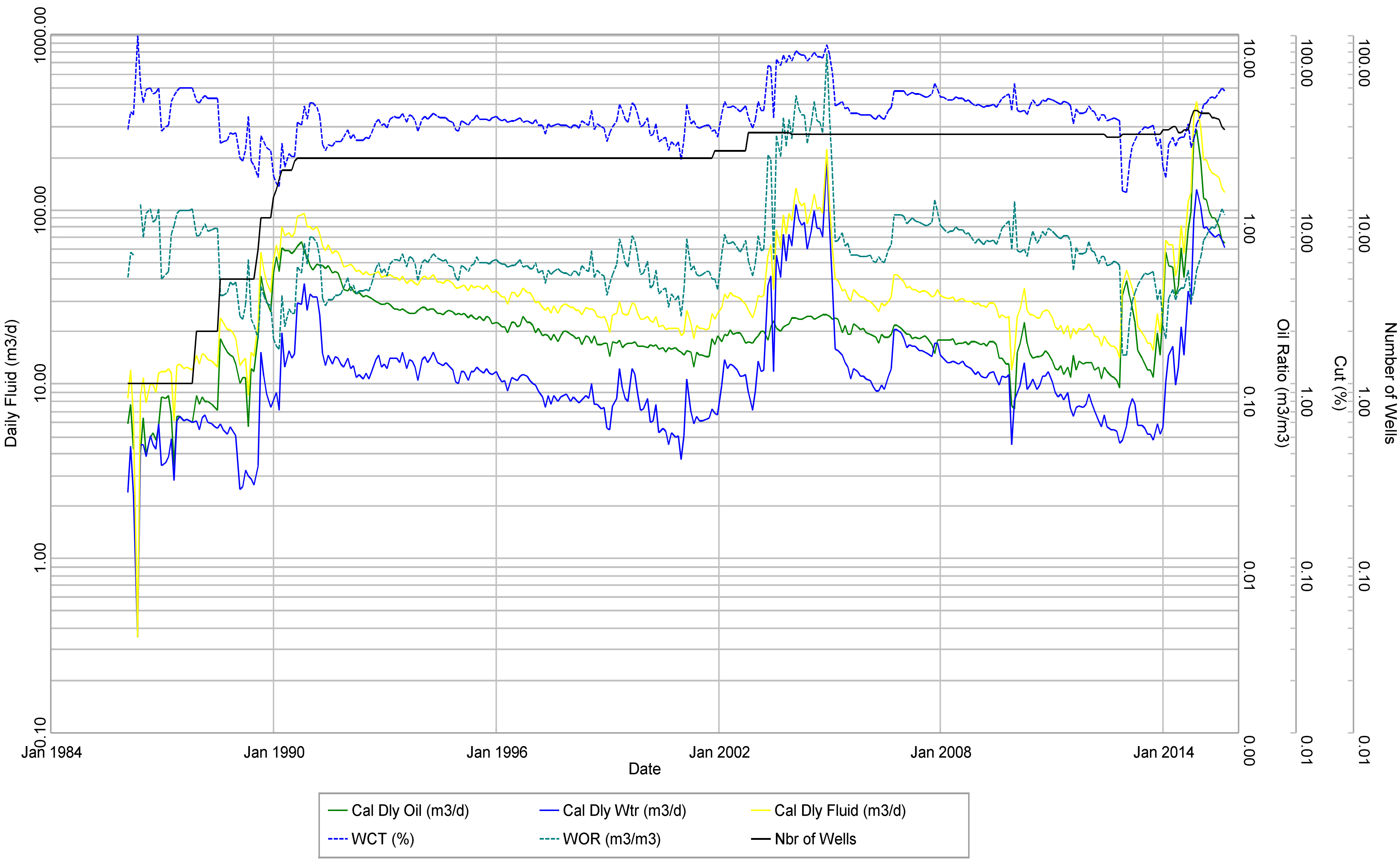


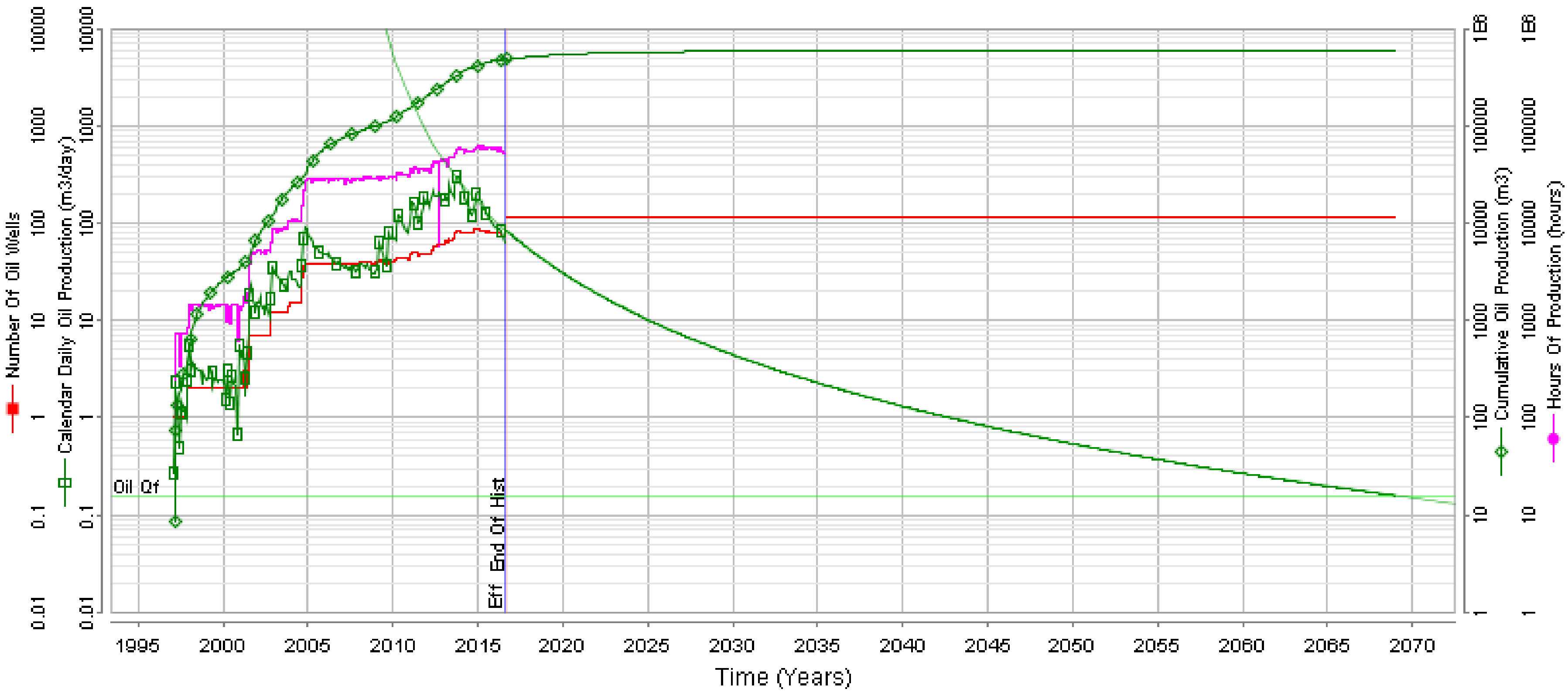
Figure No. 7

PRODUCTION AND FORECAST

Effective August 01, 2016

Operator:	**TUNDRA OIL & GAS LIMITED**
Province:	**Manitoba**
Field:	**multi zone (113)**
Pool:	**multi zone (113)**
Unit:	**multi zone (113)**
Status:	**Oil Prod**

Goodlands Unit 3
Goodlands U3- GROUP-113
Base



Oil Cum	(m3)	473,597	Gas Cum	(E3m3)	13,408	Water Cum	(m3)	1,011,357	FCond Cum	(m3)	0
Oil Rem Rec	(m3)	123,467	Gas Rem Rec	(E3m3)	0	Water Rem Rec	(m3)	0	FCond Rem Rec	(m3)	0
Oil Ult Rec	(m3)	597,064	Gas Ult Rec	(E3m3)	13,408	Water Ult Rec	(m3)	1,011,357	FCond Ult Rec	(m3)	0
Forecast Start (T0)		08/01/2016	Calculation Type		Undefined	Est Cum Prod	(m3)	473,597	Decline Exp		0.300
Forecast End (Tf)		11/12/2068	OVIP (Volumetric)	(m3)	0	Remaining Rec	(m3)	123,467	Initial Decline (De)		30.0
Initial Rate (qi)	(m3/day)	84.2	Rec Factor (Volumetric)		0.000	Gas Surface Loss		0.0	Reserve Life Index		4.68
Final Rate (qf)	(m3/day)	0.2	Ult Recoverable	(m3)	597,064	Gas Total Sales	(E3m3)	0	Reserve Half Life		3.20

Report Time: Thu, 27 Oct 2016 09:42
Economic Case: Tundra 2016 Q3 Econ Deck /
Hierarchy: Reserves
DB: WORKING_JA : Mosaic10 Version: 2016.0

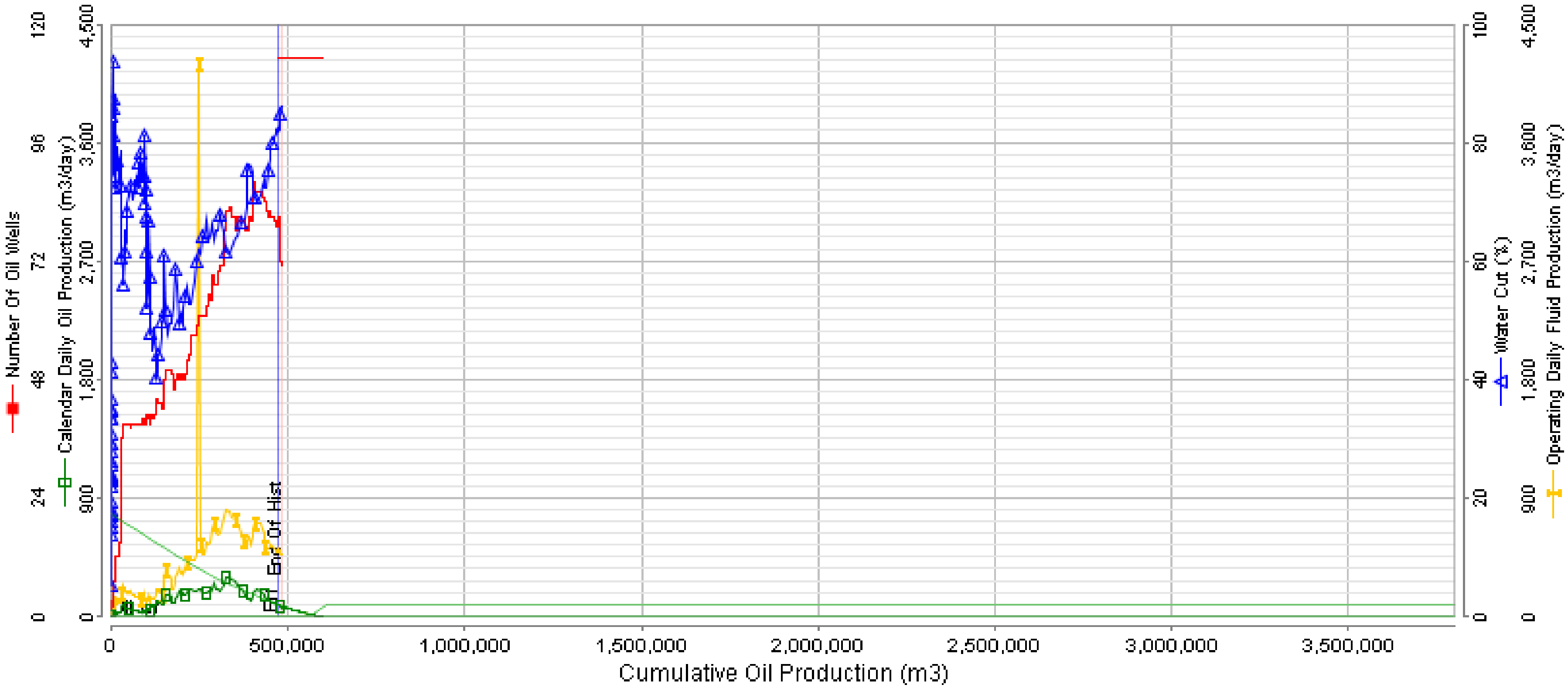
Figure No. 8

PRODUCTION AND FORECAST

Effective August 01, 2016

Operator:	**TUNDRA OIL & GAS LIMITED**
Province:	**Manitoba**
Field:	**multi zone (113)**
Pool:	**multi zone (113)**
Unit:	**multi zone (113)**
Status:	**Oil Prod**

Goodlands Unit 3
Goodlands U3- GROUP-113
Base



Oil Cum	(m3)	473,597	Gas Cum	(E3m3)	13,408	Water Cum	(m3)	1,011,357	FCond Cum	(m3)	0
Oil Rem Rec	(m3)	123,467	Gas Rem Rec	(E3m3)	0	Water Rem Rec	(m3)	0	FCond Rem Rec	(m3)	0
Oil Ult Rec	(m3)	597,064	Gas Ult Rec	(E3m3)	13,408	Water Ult Rec	(m3)	1,011,357	FCond Ult Rec	(m3)	0

Forecast Start (T0)		08/01/2016	Calculation Type		Undefined	Est Cum Prod	(m3)	473,597	Decline Exp		0.300
Forecast End (Tf)		11/12/2068	OVIP (Volumetric)	(m3)	0	Remaining Rec	(m3)	123,467	Initial Decline (De)		30.0
Initial Rate (qi)	(m3/day)	84.2	Rec Factor (Volumetric)		0.000	Gas Surface Loss		0.0	Reserve Life Index		4.68
Final Rate (qf)	(m3/day)	0.2	Ult Recoverable	(m3)	597,064	Gas Total Sales	(E3m3)	0	Reserve Half Life		3.20

Report Time: Thu, 27 Oct 2016 09:42
Economic Case: Tundra 2016 Q3 Econ Deck /
Hierarchy: Reserves
DB: WORKING_JA : Mosaic10 Version: 2016.0

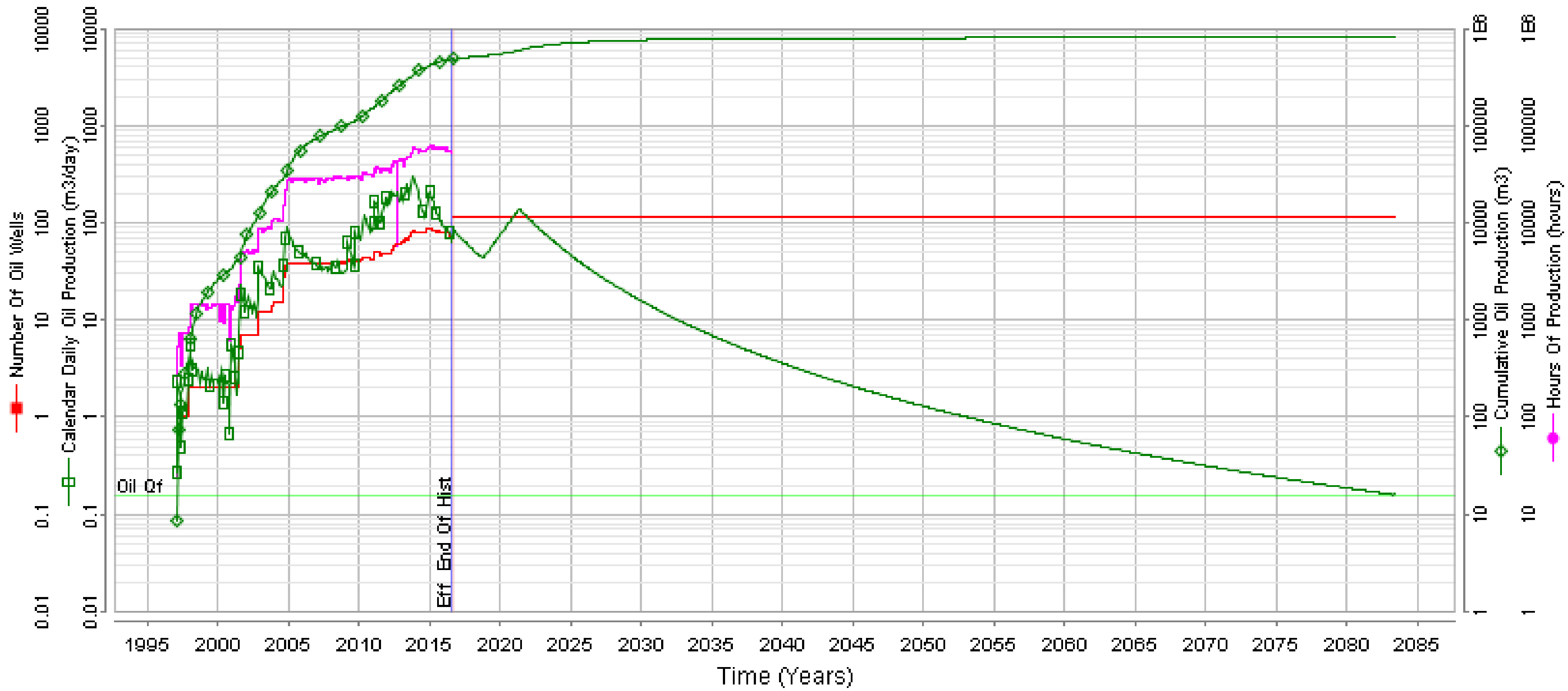
Figure No. 9

PRODUCTION AND FORECAST

Effective August 01, 2016

Operator: TUNDRA OIL & GAS LIMITED
Province: Manitoba
Field: multi zone (113)
Pool: multi zone (113)
Unit: multi zone (113)
Status: Oil Prod

Goodlands Unit 3
Goodlands U3- GROUP-113
Base + Growth 1



Oil Cum	(m3)	473,597	Gas Cum	(E3m3)	13,408	Water Cum	(m3)	1,011,357	FCond Cum	(m3)	0
Oil Rem Rec	(m3)	326,296	Gas Rem Rec	(E3m3)	0	Water Rem Rec	(m3)	0	FCond Rem Rec	(m3)	0
Oil Ult Rec	(m3)	799,893	Gas Ult Rec	(E3m3)	13,408	Water Ult Rec	(m3)	1,011,357	FCond Ult Rec	(m3)	0
Forecast Start (T0)		08/01/2016	Calculation Type		Undefined	Est Cum Prod	(m3)	473,597	Decline Exp		0.300
Forecast End (Tf)		04/10/2083	OVIP (Volumetric)	(m3)	0	Remaining Rec	(m3)	326,296	Initial Decline (De)		30.0
Initial Rate (qi)	(m3/day)	84.2	Rec Factor (Volumetric)		0.000	Gas Surface Loss		0.0	Reserve Life Index		12.37
Final Rate (qf)	(m3/day)	0.2	Ult Recoverable	(m3)	799,893	Gas Total Sales	(E3m3)	0	Reserve Half Life		5.66

Report Time: Thu, 27 Oct 2016 09:40
Economic Case: Tundra 2016 Q3 Econ Deck /
Hierarchy: Reserves
DB: WORKING_JA : Mosaic10 Version: 2016.0

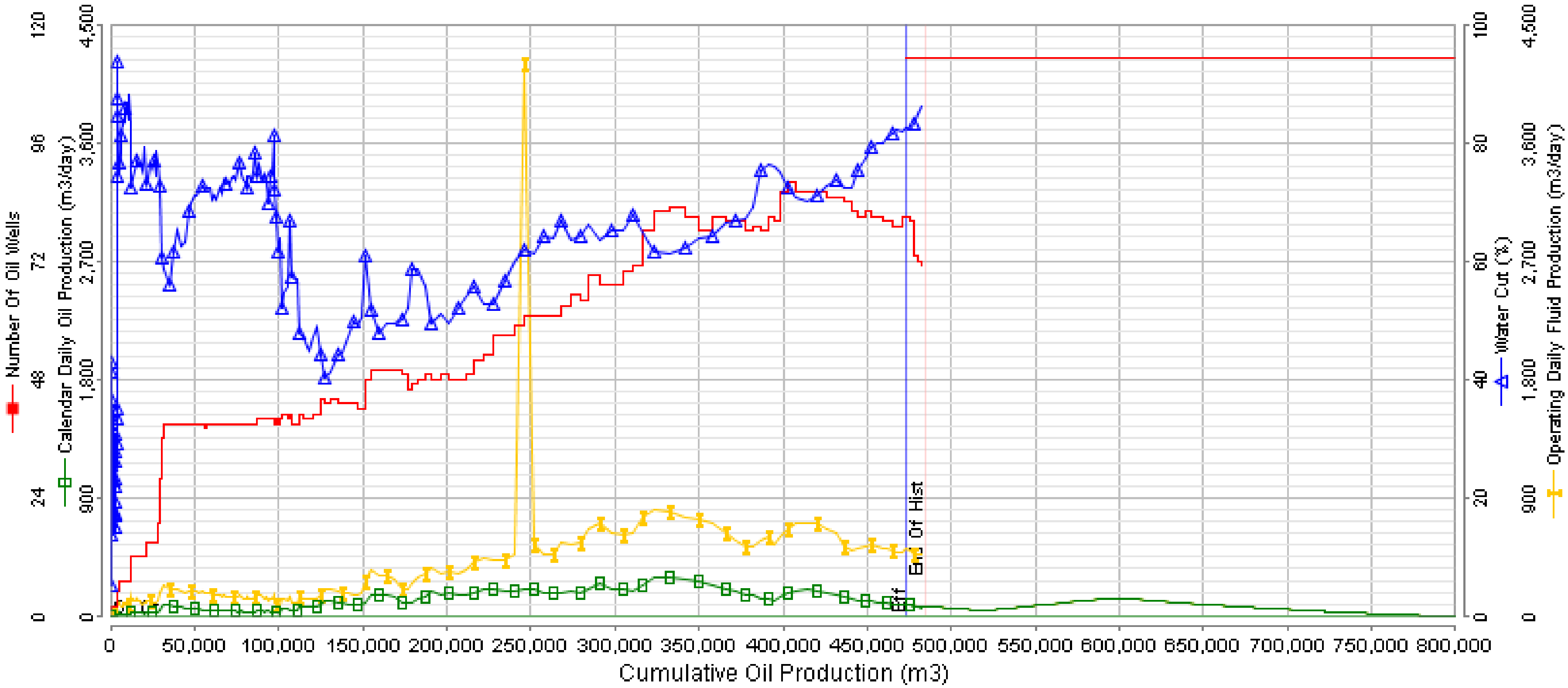
Figure No. 10

PRODUCTION AND FORECAST

Effective August 01, 2016

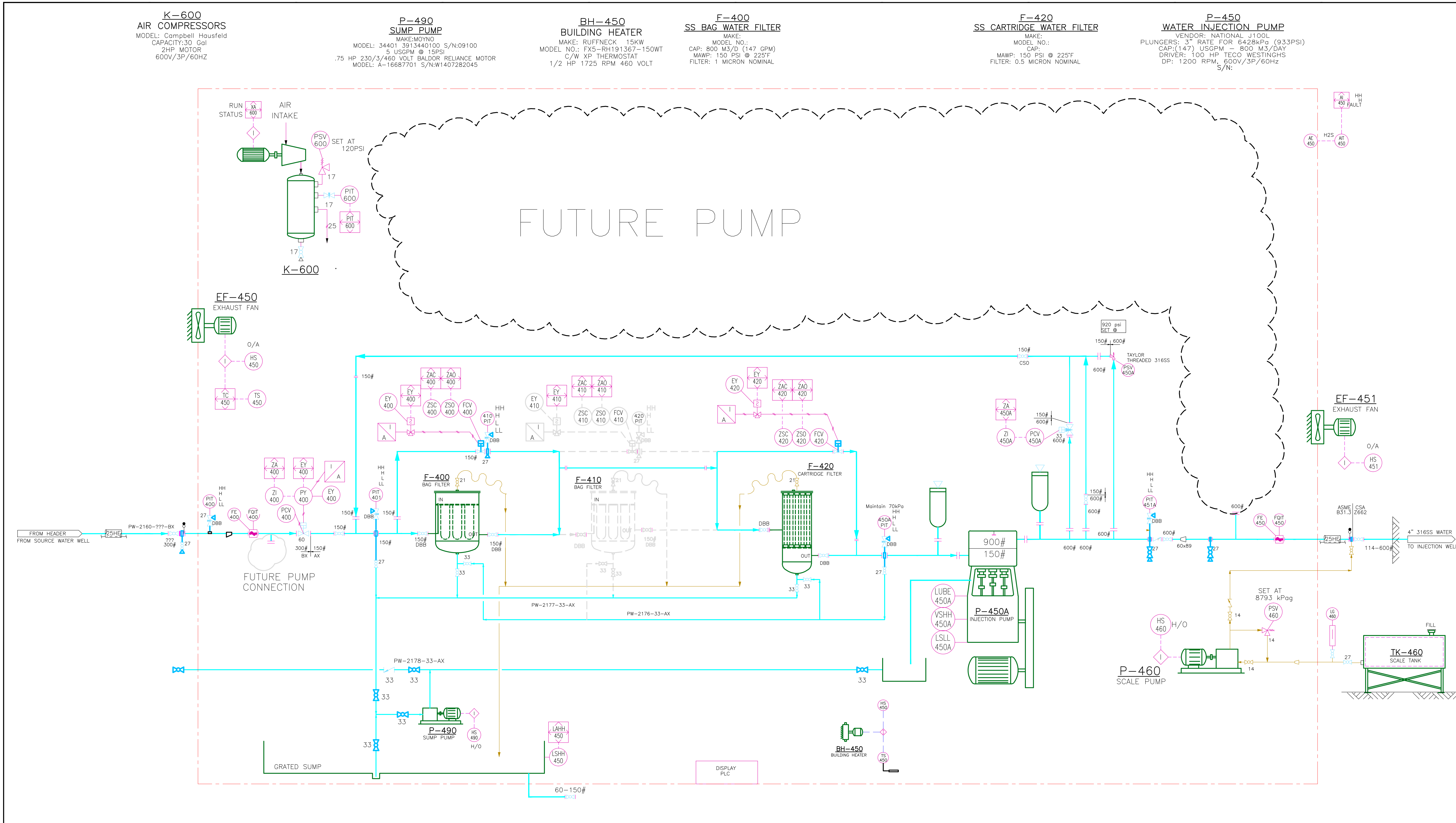
Operator:	**TUNDRA OIL & GAS LIMITED**
Province:	**Manitoba**
Field:	**multi zone (113)**
Pool:	**multi zone (113)**
Unit:	**multi zone (113)**
Status:	**Oil Prod**

Goodlands Unit 3
Goodlands U3- GROUP-113
Base + Growth 1



Oil Cum	(m3)	473,597	Gas Cum	(E3m3)	13,408	Water Cum	(m3)	1,011,357	FCond Cum	(m3)	0
Oil Rem Rec	(m3)	326,296	Gas Rem Rec	(E3m3)	0	Water Rem Rec	(m3)	0	FCond Rem Rec	(m3)	0
Oil Ult Rec	(m3)	799,893	Gas Ult Rec	(E3m3)	13,408	Water Ult Rec	(m3)	1,011,357	FCond Ult Rec	(m3)	0
Forecast Start (T0)		08/01/2016	Calculation Type		Undefined	Est Cum Prod	(m3)	473,597	Decline Exp		0.300
Forecast End (Tf)		04/10/2083	OVIP (Volumetric)	(m3)	0	Remaining Rec	(m3)	326,296	Initial Decline (De)		30.0
Initial Rate (qi)	(m3/day)	84.2	Rec Factor (Volumetric)		0.000	Gas Surface Loss		0.0	Reserve Life Index		12.37
Final Rate (qf)	(m3/day)	0.2	Ult Recoverable	(m3)	799,893	Gas Total Sales	(E3m3)	0	Reserve Half Life		5.66

Report Time: Thu, 27 Oct 2016 09:40
Economic Case: Tundra 2016 Q3 Econ Deck /
Hierarchy: Reserves
DB: WORKING_JA : Mosaic10 Version: 2016.0



REV	DESCRIPTION	BY	DATE	CHK	APP
0	ISSUED FOR REVIEW	JC	17SEPT2016	–	–

REFERENCE DRAWING
–

NOTES:
1.

Figure No. 11a

TUNDRA OIL & GAS PARTNERSHIP

GOODLANDS
16–10–1–24 W1M

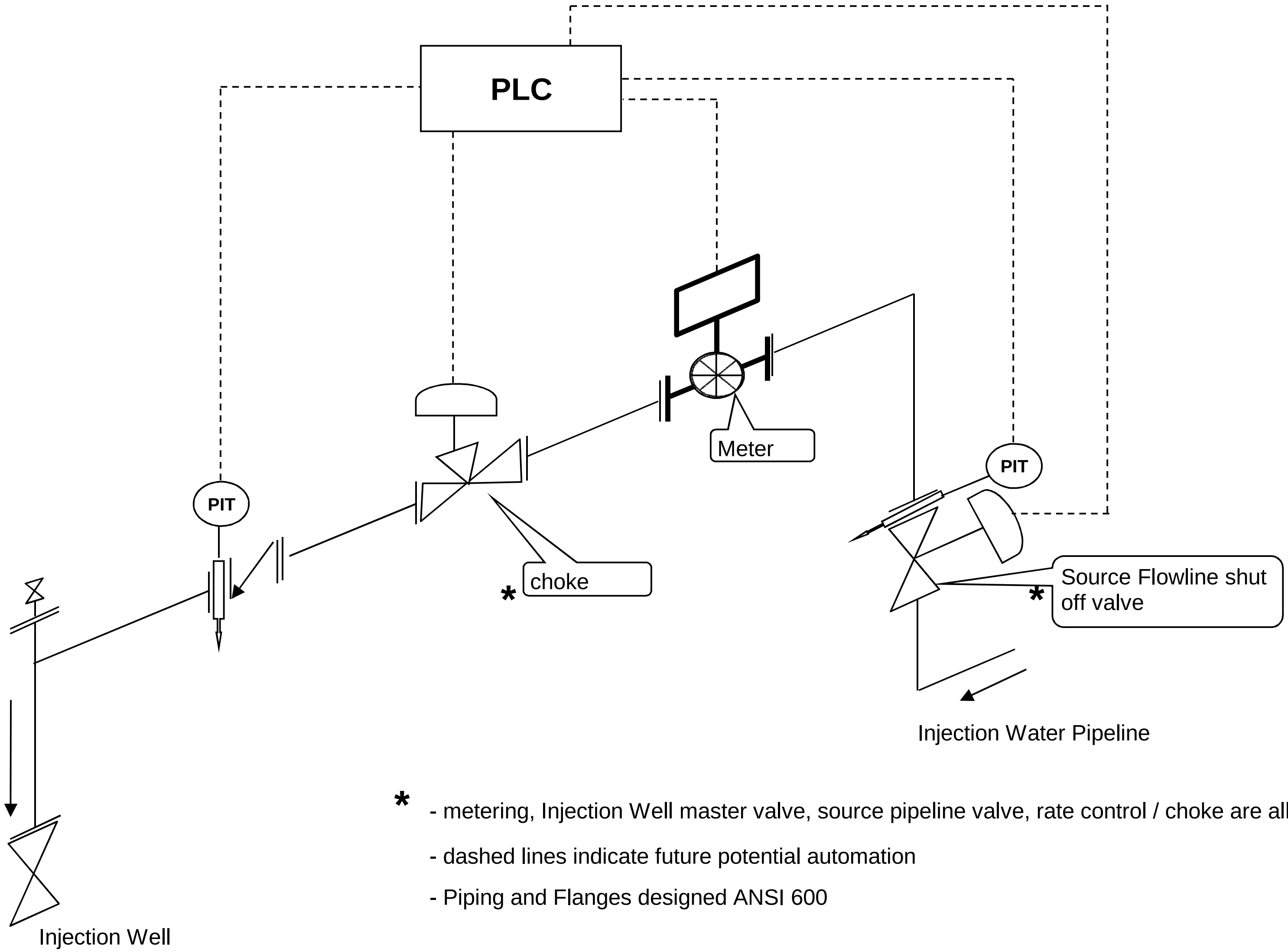
PROCESS & INSTRUMENTATION DIAGRAM
INJECTION PUMP BUILDING

DRAWN BY:	SCALE:	AFE:	DRAWING NUMBER:	REV NO:
JC	NTS		16-10-1-24-PID-2100	0

Figure No. 11b

Goodlands Unit No. 3

Proposed Injection Well Surface Piping P&ID



* - metering, Injection Well master valve, source pipeline valve, rate control / choke are all standard

- dashed lines indicate future potential automation

- Piping and Flanges designed ANSI 600

Tundra Oil And Gas Partnership — Figure No. 12

TYPICAL CEMENTED LINER WATER INJECTION WELL (WIW) DOWNHOLE DIAGRAM

WELL NAME:	Tundra Goodlands Unit 3 HZNTL Cemented Liner WIW			**WELL LICENCE:**		
Prepared by	WRJ	(average depths)		Date:	2012	
Elevations :						
KB [m]		KB to THF [m]			TD [m]	2400.0
GL [m]		CF (m)			PBTD [m]	
Current Perfs:	**Cemented Casing / Liner**			950.0	to	2400.0
Current Perfs:					to	
KOP:	700 m MD		Total Interval		to	
Tubulars	**Size [mm]**	**Wt - Kg/m**	**Grade**	**Landing Depth [mKB]**		
Surface Casing	244.5	48.06	H-40 - ST&C	Surface	to	140.0
Intermed Csg (if run)	177.8	34.23 & 29.76	J-55 - LT&C	Surface	to	950.0
Production Liner	114.3	17.26	L-80	Surf or from Intermed Csg to		2400.0
Tubing	60.3 or 73.0 - TK-99	6.99 or 9.67	J-55	Surface	to	940.0

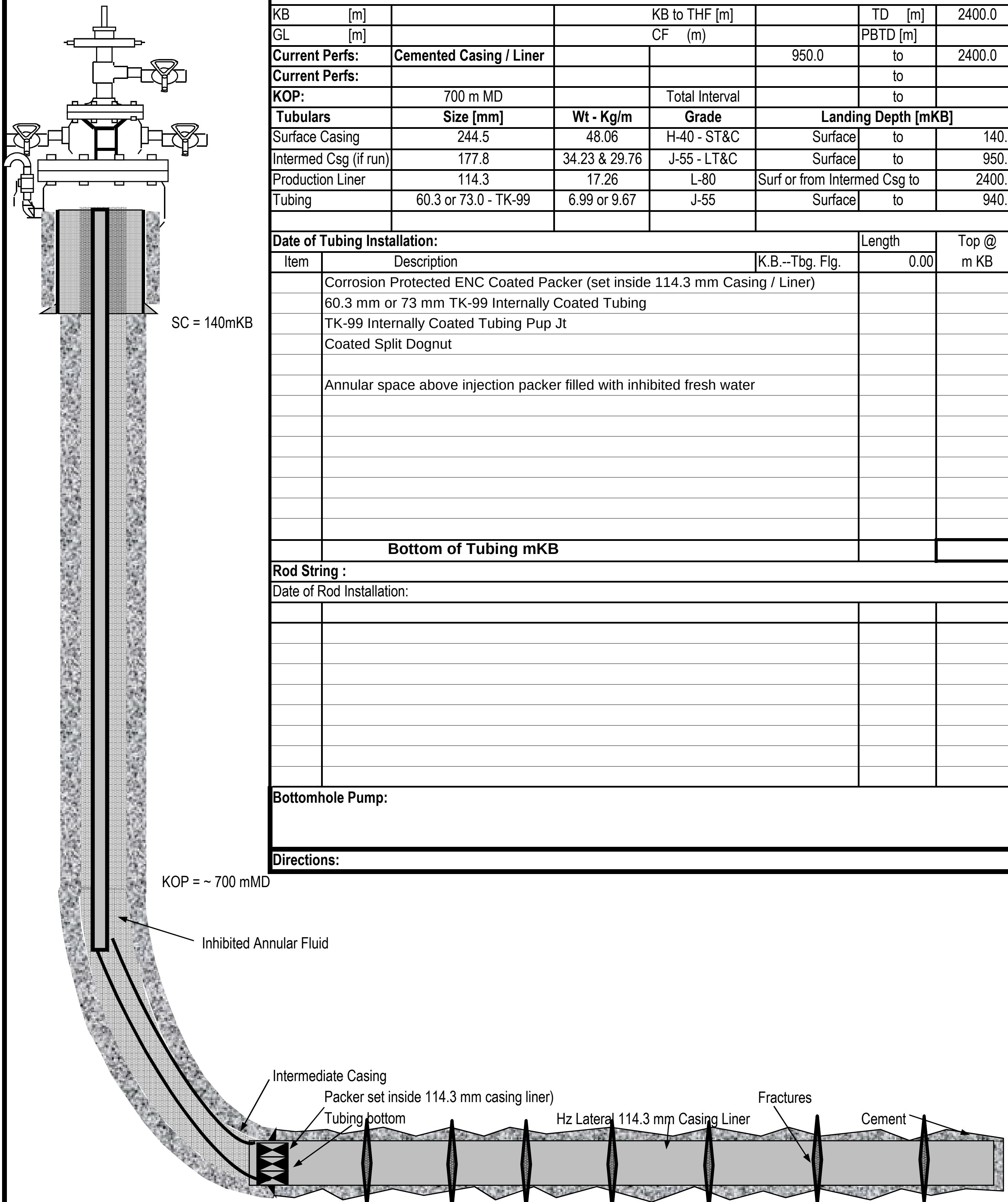
Date of Tubing Installation:			Length	Top @
Item	Description	K.B.--Tbg. Flg.	0.00	m KB
	Corrosion Protected ENC Coated Packer (set inside 114.3 mm Casing / Liner)			
	60.3 mm or 73 mm TK-99 Internally Coated Tubing			
	TK-99 Internally Coated Tubing Pup Jt			
	Coated Split Dognut			
	Annular space above injection packer filled with inhibited fresh water			
	Bottom of Tubing mKB			

Rod String :

Date of Rod Installation:

Bottomhole Pump:

Directions:



Goodlands Unit No. 3

EOR Waterflood Project

<u>Planned Corrosion Control Program</u> **

<u>Source Well</u>

- Continuous downhole corrosion inhibition
- Continuous surface corrosion inhibitor injection
- Downhole scale inhibitor injection
- Corrosion resistant valves and internally coated surface piping

<u>Pipelines</u>

- Source well to 11-30-1-25 Water Plant – Fiberglass
- New High Pressure Pipeline to Unit 9 injection wells – 2000 psi high pressure Fiberglass

<u>Facilities</u>

- 11-30-1-25 Water Plant and New Injection Pump Station
    - Plant piping – 600 ANSI schedule 80 pipe, Fiberglass or Internally coated
    - Filtration – Stainless steel bodies and PVC piping
    - Pumping – Ceramic plungers, stainless steel disc valves
    - Tanks – Fiberglass shell, corrosion resistant valves

<u>Injection Wellhead / Surface Piping</u>

- Corrosion resistant valves and stainless steel and/or internally coated steel surface piping

<u>Injection Well</u>

- Casing cathodic protection where required
- Wetted surfaces coated downhole packer
- Corrosion inhibited water in the annulus between tubing / casing
- Internally coated tubing surface to packer
- Surface freeze protection of annular fluid
- Corrosion resistant master valve
- Corrosion resistant pipeline valve

<u>Producing Wells</u>

- Casing cathodic protection where required
- Downhole batch corrosion inhibition as required
- Downhole scale inhibitor injection as required

Figure 13

** subject to final design and engineering

Proposed Goodlands Unit No. 3

Application for Enhanced Oil Recovery Waterflood Project

List of Tables

TABLE NO. 1: TRACT PARTICIPATION FOR PROPOSED GOODLANDS UNIT NO. 3

Working Interest				Royalty Interest		Tract Participation
Tract No.	**Land Description**	**Owner**	**Share (%)**	**Owner**	**Share (%)**	**Tract (%)**
1	01-09-001-24W1M	Tundra Oil & Gas Partnership	100%	4438851 Manitoba Ltd.	25%	1.691651890%
				5544573 Manitoba Ltd.	25%	
				5153247 Manitoba Ltd.	25%	
				6167471 Manitoba Ltd.	25%	
2	02-09-001-24W1M	Tundra Oil & Gas Partnership	100%	4438851 Manitoba Ltd.	25%	1.796707306%
				5544573 Manitoba Ltd.	25%	
				5153247 Manitoba Ltd.	25%	
				6167471 Manitoba Ltd.	25%	
3	03-09-001-24W1M	Tundra Oil & Gas Partnership	100%	Meggison Resources Ltd.	100%	1.779092359%
4	04-09-001-24W1M	Tundra Oil & Gas Partnership	100%	Meggison Resources Ltd.	100%	1.615614457%
5	05-09-001-24W1M	Tundra Oil & Gas Partnership	100%	Meggison Resources Ltd.	100%	1.580550249%
6	06-09-001-24W1M	Tundra Oil & Gas Partnership	100%	Meggison Resources Ltd.	100%	1.694111213%
7	07-09-001-24W1M	Tundra Oil & Gas Partnership	100%	4438851 Manitoba Ltd.	25%	3.127048063%
				5544573 Manitoba Ltd.	25%	
				5153247 Manitoba Ltd.	25%	
				6167471 Manitoba Ltd.	25%	
8	08-09-001-24W1M	Tundra Oil & Gas Partnership	100%	4438851 Manitoba Ltd.	25%	3.111231618%
				5544573 Manitoba Ltd.	25%	
				5153247 Manitoba Ltd.	25%	
				6167471 Manitoba Ltd.	25%	
9	09-09-001-24W1M	Tundra Oil & Gas Partnership	100%	4438851 Manitoba Ltd.	25%	1.528284892%
				5544573 Manitoba Ltd.	8.333%	
				6167471 Manitoba Ltd.	8.334%	
				5153247 Manitoba Ltd.	8.333%	
				Tundra Oil & Gas Partnership	50.0%	
10	10-09-001-24W1M	Tundra Oil & Gas Partnership	100%	4438851 Manitoba Ltd.	25%	1.562488053%
				5544573 Manitoba Ltd.	8.333%	
				6167471 Manitoba Ltd.	8.334%	
				5153247 Manitoba Ltd.	8.333%	
				Tundra Oil & Gas Partnership	50.0%	
11	11-09-001-24W1M	Tundra Oil & Gas Partnership	100%	Meggison Resources Ltd.	100%	1.836700563%
12	12-09-001-24W1M	Tundra Oil & Gas Partnership	100%	Meggison Resources Ltd.	100%	1.849687422%
13	13-09-001-24W1M	Tundra Oil & Gas Partnership	100%	Meggison Resources Ltd.	100%	1.853362342%
14	14-09-001-24W1M	Tundra Oil & Gas Partnership	100%	Meggison Resources Ltd.	100%	1.788883149%

Working Interest				Royalty Interest		Tract Participation
Tract No.	Land Description	Owner	Share (%)	Owner	Share (%)	Tract (%)
15	01-10-001-24W1M	Tundra Oil & Gas Partnership	100%	Caroline Elizabeth Meggison	25%	1.670849285%
				Douglas Clark Meggison	25%	
				4442164 Manitoba Ltd.	50%	
16	02-10-001-24W1M	Tundra Oil & Gas Partnership	100%	Caroline Elizabeth Meggison	25%	1.501899199%
				Douglas Clark Meggison	25%	
				4442164 Manitoba Ltd.	50%	
17	03-10-001-24W1M	Tundra Oil & Gas Partnership	100%	4438851 Manitoba Ltd.	100%	1.940580292%
18	04-10-001-24W1M	Tundra Oil & Gas Partnership	100%	4438851 Manitoba Ltd.	100%	1.585655272%
19	05-10-001-24W1M	Tundra Oil & Gas Partnership	100%	4438851 Manitoba Ltd.	100%	1.693493881%
20	06-10-001-24W1M	Tundra Oil & Gas Partnership	100%	4438851 Manitoba Ltd.	100%	1.492408416%
21	11-10-001-24W1M	Tundra Oil & Gas Partnership	100%	4438851 Manitoba Ltd.	100%	1.690942744%
22	12-10-001-24W1M	Tundra Oil & Gas Partnership	100%	4438851 Manitoba Ltd.	100%	1.721429674%
23	13-10-001-24W1M	Tundra Oil & Gas Partnership	100%	4438851 Manitoba Ltd.	100%	2.759289195%
24	14-10-001-24W1M	Tundra Oil & Gas Partnership	100%	4438851 Manitoba Ltd.	100%	2.639252975%
25	03-11-001-24W1M	Tundra Oil & Gas Partnership	100%	Minister of Finance - Manitoba	100%	1.293616157%
26	04-11-001-24W1M	Tundra Oil & Gas Partnership	100%	Minister of Finance - Manitoba	100%	1.262471634%
27	05-14-001-24W1M	Tundra Oil & Gas Partnership	100%	Tundra Oil & Gas Partnership	50.0%	2.468914554%
				5972435 Manitoba Ltd.	33.333%	
				6537171 Manitoba Ltd.	4.167%	
				Kevin Lee Adams	4.167%	
				6537180 Manitoba Ltd.	8.333%	
28	06-14-001-24W1M	Tundra Oil & Gas Partnership	100%	Tundra Oil & Gas Partnership	50.0%	2.147288747%
				5972435 Manitoba Ltd.	33.333%	
				6537171 Manitoba Ltd.	4.167%	
				Kevin Lee Adams	4.167%	
				6537180 Manitoba Ltd.	8.333%	
29	11-14-001-24W1M	Tundra Oil & Gas Partnership	100%	Nestibo Holdings Ltd.	50.0%	1.985479337%
				James C. Wynne (Estate)	50.0%	
30	12-14-001-24W1M	Tundra Oil & Gas Partnership	100%	Nestibo Holdings Ltd.	50.0%	2.140747802%
				James C. Wynne (Estate)	50.0%	
31	13-14-001-24W1M	Tundra Oil & Gas Partnership	100%	Nestibo Holdings Ltd.	50.0%	2.626214099%
				James C. Wynne (Estate)	50.0%	
32	14-14-001-24W1M	Tundra Oil & Gas Partnership	100%	Nestibo Holdings Ltd.	50.0%	2.463849160%
				James C. Wynne (Estate)	50.0%	
33	15-14-001-24W1M	Tundra Oil & Gas Partnership	100%	Nestibo Holdings Ltd.	50.0%	2.177488056%
				James C. Wynne (Estate)	50.0%	

Working Interest				Royalty Interest		Tract Participation
Tract No.	Land Description	Owner	Share (%)	Owner	Share (%)	Tract (%)
34	16-14-001-24W1M	Tundra Oil & Gas Partnership	100%	Nestibo Holdings Ltd.	50.0%	2.122860508%
				James C. Wynne (Estate)	50.0%	
35	03-15-001-24W1M	Tundra Oil & Gas Partnership	100%	Tundra Oil & Gas Partnership	50.0%	3.364356485%
				6864512 Manitoba Ltd.	12.5%	
				6167552 Manitoba Ltd.	12.5%	
				Computershare Trust Company of Canada	25.0%	
36	04-15-001-24W1M	Tundra Oil & Gas Partnership	100%	Tundra Oil & Gas Partnership	50.0%	3.464141218%
				6864512 Manitoba Ltd.	12.5%	
				6167552 Manitoba Ltd.	12.5%	
				Computershare Trust Company of Canada	25.0%	
37	05-15-001-24W1M	Tundra Oil & Gas Partnership	100%	Tundra Oil & Gas Partnership	50.0%	1.790714088%
				6864512 Manitoba Ltd.	12.5%	
				6167552 Manitoba Ltd.	12.5%	
				Computershare Trust Company of Canada	25.0%	
38	06-15-001-24W1M	Tundra Oil & Gas Partnership	100%	Tundra Oil & Gas Partnership	50.0%	1.815663899%
				6864512 Manitoba Ltd.	12.5%	
				6167552 Manitoba Ltd.	12.5%	
				Computershare Trust Company of Canada	25.0%	
39	07-15-001-24W1M	Tundra Oil & Gas Partnership	100%	5922250 Manitoba Ltd.	100%	1.479346565%
40	08-15-001-24W1M	Tundra Oil & Gas Partnership	100%	5922250 Manitoba Ltd.	100%	1.750821641%
41	09-15-001-24W1M	Tundra Oil & Gas Partnership	100%	2637490 Manitoba Ltd.	100%	1.704570453%
42	10-15-001-24W1M	Tundra Oil & Gas Partnership	100%	2637490 Manitoba Ltd.	100%	1.458363451%
43	11-15-001-24W1M	Tundra Oil & Gas Partnership	100%	2637490 Manitoba Ltd.	50%	1.455258282%
				Computershare Trust Company of Canada	50%	
44	12-15-001-24W1M	Tundra Oil & Gas Partnership	100%	2637490 Manitoba Ltd.	50%	1.600458086%
				Computershare Trust Company of Canada	50%	
45	13-15-001-24W1M	Tundra Oil & Gas Partnership	100%	2637490 Manitoba Ltd.	50%	1.835689180%
				Computershare Trust Company of Canada	50%	
46	14-15-001-24W1M	Tundra Oil & Gas Partnership	100%	2637490 Manitoba Ltd.	50%	1.849111075%
				Computershare Trust Company of Canada	50%	
47	15-15-001-24W1M	Tundra Oil & Gas Partnership	100%	2637490 Manitoba Ltd.	100%	2.839697725%
48	16-15-001-24W1M	Tundra Oil & Gas Partnership	100%	2637490 Manitoba Ltd.	100%	3.182340791%
49	03-16-001-24W1M	Tundra Oil & Gas Partnership	100%	Minister of Finance - Manitoba	100%	2.079862422%
50	04-16-001-24W1M	Tundra Oil & Gas Partnership	100%	Minister of Finance - Manitoba	100%	2.129460077%
						100.000000000%

TABLE NO. 2: TRACT FACTOR CALCULATIONS FOR GOODLANDS UNIT NO. 3

TRACT FACTORS BASED ON OIL-IN-PLACE (OOIP) - CUMULATIVE PRODUCTION & LAST 12 MONTHS OF PRODUCTION TO JULY 2016

LS-SE	Tract	OOIP (m3)	HZ Wells Cum Alloc Prod (m3)	Vert Wells Cum Prodn (m3)	Sum Hz + Vert Alloc Cum Prodn	OOIP - Cum	OOIP-Cum by LSD/Total OOIP	Last 12 Mths Alloc Prod (m3)	Vt Wells Last 12 Mths Prod (m3)	Sum Hz + Vert Alloc Last 12 Mths Prod (m3)	Last 12 Mths Prod by LSD/Total Prod	50% OOIP-Cum + 50% Last 12 Mths Prod Tract Factor
01-09	01-09-001-24W1M	121,217	9,811.6	1,922.9	11,734.5	109,482	0.01935403230	464.5	0.0	464.5	0.014479006	0.01691651890
02-09	02-09-001-24W1M	123,040	9,104.2	3,244.8	12,349.0	110,691	0.01956777621	525.1	0.0	525.1	0.016366370	0.01796707306
03-09	03-09-001-24W1M	124,700	9,232.2	4,595.5	13,827.7	110,872	0.01959979124	420.8	91.9	512.7	0.015982056	0.01779092359
04-09	04-09-001-24W1M	125,522	7,587.0	5,102.0	12,689.0	112,833	0.01994641086	273.1	123.6	396.7	0.012365878	0.01615614457
05-09	05-09-001-24W1M	126,282	4,837.9	2,100.4	6,938.3	119,344	0.02109735034	299.7	37.6	337.3	0.010513655	0.01580550249
06-09	06-09-001-24W1M	125,630	5,341.2	2,913.7	8,254.9	117,375	0.02074935768	401.1	20.2	421.3	0.013132867	0.01694111213
07-09	07-09-001-24W1M	123,880	6,056.8	3,371.7	9,428.5	114,451	0.02023246226	1,357.4	0.0	1,357.4	0.042308499	0.03127048063
08-09	08-09-001-24W1M	121,568	6,802.9	4,300.2	11,103.1	110,465	0.01952776555	1,312.0	57.8	1,369.8	0.042696867	0.03111231618
09-09	09-09-001-24W1M	124,307	2,266.4	4,515.4	6,781.8	117,526	0.02077593813	314.1	0.0	314.1	0.009789760	0.01528284892
10-09	10-09-001-24W1M	126,142	2,189.4	886.0	3,075.4	123,067	0.02175547880	304.6	0.0	304.6	0.009494282	0.01562488053
11-09	11-09-001-24W1M	126,880	6,401.8	2,229.5	8,631.3	118,249	0.02090373931	507.9	0.0	507.9	0.015830272	0.01836700563
12-09	12-09-001-24W1M	127,400	6,519.0	2,825.6	9,344.6	118,055	0.02086955053	517.3	0.0	517.3	0.016124198	0.01849687422
13-09	13-09-001-24W1M	129,271	3,322.4	2,074.6	5,397.0	123,874	0.02189819299	486.7	0.0	486.7	0.015169054	0.01853362342
14-09	14-09-001-24W1M	128,136	3,186.4	4,293.2	7,479.6	120,656	0.02132936070	463.5	0.0	463.5	0.014448302	0.01788883149
01-10	01-10-001-24W1M	110,118	8,876.6	0.0	8,876.6	101,241	0.01789720824	497.9	0.0	497.9	0.015519777	0.01670849285
02-10	02-10-001-24W1M	116,306	5,195.6	2,870.7	8,066.3	108,239	0.01913431266	349.8	0.0	349.8	0.010903671	0.01501899199
03-10	03-10-001-24W1M	120,047	13,050.9	2,410.5	15,461.4	104,585	0.01848835754	652.0	0.0	652.0	0.020323248	0.01940580292
04-10	04-10-001-24W1M	121,008	8,266.1	3,013.2	11,279.3	109,729	0.01939768966	395.1	0.0	395.1	0.012315416	0.01585655272
05-10	05-10-001-24W1M	122,199	8,171.7	6,160.9	14,332.6	107,867	0.01906845063	359.0	115.9	474.9	0.014801427	0.01693493881
06-10	06-10-001-24W1M	122,382	7,195.5	4,129.8	11,325.3	111,057	0.01963239630	325.0	2.7	327.7	0.010215772	0.01492408416
11-10	11-10-001-24W1M	123,093	7,630.8	5,127.9	12,758.7	110,334	0.01950462599	459.2	0.0	459.2	0.014314229	0.01690942744
12-10	12-10-001-24W1M	123,573	7,833.5	4,574.9	12,408.4	111,164	0.01965143267	474.1	0.0	474.1	0.014777161	0.01721429674
13-10	13-10-001-24W1M	123,834	3,881.3	6,579.0	10,460.3	113,373	0.02004190532	1,102.0	25.5	1,127.5	0.035143879	0.02759289195
14-10	14-10-001-24W1M	121,239	3,771.7	4,850.0	8,621.7	112,617	0.01990824272	1,054.8	0.0	1,054.8	0.032876817	0.02639252975
03-11	03-11-001-24W1M	112,008	5,742.7	0.0	5,742.7	106,265	0.01878538533	227.4	0.0	227.4	0.007086938	0.01293616157
04-11	04-11-001-24W1M	110,433	5,429.5	0.0	5,429.5	105,003	0.01856223606	214.5	0.0	214.5	0.006687197	0.01262471634
05-14	05-14-001-24W1M	122,094	5,000.3	5,482.0	10,482.3	111,612	0.01973054353	783.0	168.2	951.2	0.029647748	0.02468914554
06-14	06-14-001-24W1M	121,250	5,106.6	2,640.4	7,747.0	113,503	0.02006484473	734.1	0.0	734.1	0.022880930	0.02147288747
11-14	11-14-001-24W1M	119,800	5,822.1	2,018.6	7,840.7	111,959	0.01979196516	639.0	0.0	639.0	0.019917622	0.01985479337
12-14	12-14-001-24W1M	121,431	5,884.9	4,963.0	10,847.9	110,583	0.01954870761	746.4	0.0	746.4	0.023266248	0.02140747802
13-14	13-14-001-24W1M	120,843	10,003.1	0.0	10,003.1	110,840	0.01959406400	1,056.5	0.0	1,056.5	0.032930218	0.02626214099
14-14	14-14-001-24W1M	119,318	9,763.4	3,444.5	13,207.9	106,110	0.01875799156	940.2	38.9	979.1	0.030518992	0.02463849160
15-14	15-14-001-24W1M	118,320	4,031.5	3,430.7	7,462.2	110,858	0.01959720771	768.5	0.0	768.5	0.023952553	0.02177488056
16-14	16-14-001-24W1M	120,163	3,412.7	3,225.2	6,637.9	113,525	0.02006867524	718.3	0.0	718.3	0.022388535	0.02122860508
03-15	03-15-001-24W1M	121,829	7,676.9	0.0	7,676.9	114,152	0.02017953357	1,511.3	0.0	1,511.3	0.047107596	0.03364356485

LS-SE	Tract	OOIP (m3)	HZ Wells Cum Alloc Prod (m3)	Vert Wells Cum Prodn (m3)	Sum Hz + Vert Alloc Cum Prodn	OOIP - Cum	OOIP-Cum by LSD/Total OOIP	Last 12 Mths Alloc Prod (m3)	Vt Wells Last 12 Mths Prod (m3)	Sum Hz + Vert Alloc Last 12 Mths Prod (m3)	Last 12 Mths Prod by LSD/Total Prod	50% OOIP-Cum + 50% Last 12 Mths Prod Tract Factor
04-15	04-15-001-24W1M	124,598	7,367.2	0.0	7,367.2	117,231	0.02072388057	1,557.9	0.0	1,557.9	0.048558944	0.03464141218
05-15	05-15-001-24W1M	125,885	10,502.4	4,579.4	15,081.8	110,803	0.01958748396	520.6	0.0	520.6	0.016226798	0.01790714088
06-15	06-15-001-24W1M	123,708	10,625.7	2,926.8	13,552.5	110,155	0.01947306595	540.3	0.0	540.3	0.016840212	0.01815663899
07-15	07-15-001-24W1M	122,053	6,021.3	2,863.2	8,884.5	113,168	0.02000568814	307.4	0.0	307.4	0.009581243	0.01479346565
08-15	08-15-001-24W1M	122,293	6,503.0	4,121.8	10,624.8	111,668	0.01974048128	490.1	0.0	490.1	0.015275952	0.01750821641
09-15	09-15-001-24W1M	122,241	3,737.9	3,223.6	6,961.5	115,279	0.02037880080	326.1	113.8	439.9	0.013712608	0.01704570453
10-15	10-15-001-24W1M	122,357	2,970.5	3,142.9	6,113.4	116,243	0.02054923814	125.9	150.6	276.5	0.008618031	0.01458363451
11-15	11-15-001-24W1M	123,883	7,131.9	1,793.3	8,925.2	114,958	0.02032199495	281.8	0.0	281.8	0.008783171	0.01455258282
12-15	12-15-001-24W1M	125,783	6,695.7	3,667.2	10,362.9	115,420	0.02040370675	236.8	135.5	372.3	0.011605455	0.01600458086
13-15	13-15-001-24W1M	127,180	8,514.3	0.0	8,514.3	118,666	0.02097753765	504.9	0.0	504.9	0.015736246	0.01835689180
14-15	14-15-001-24W1M	124,206	8,705.6	0.0	8,705.6	115,500	0.02041786139	531.4	0.0	531.4	0.016564360	0.01849111075
15-15	15-15-001-24W1M	122,465	10,275.2	0.0	10,275.2	112,190	0.01983264298	1,185.8	0.0	1,185.8	0.036961312	0.02839697725
16-15	16-15-001-24W1M	121,799	11,324.8	0.0	11,324.8	110,474	0.01952933439	1,415.4	0.0	1,415.4	0.044117481	0.03182340791
03-16	03-16-001-24W1M	127,904	6,446.3	0.0	6,446.3	121,457	0.02147099783	645.7	0.0	645.7	0.020126251	0.02079862422
04-16	04-16-001-24W1M	128,796	6,753.8	0.0	6,753.8	122,042	0.02157430210	674.2	0.0	674.2	0.021014899	0.02129460077
		6,130,410	**337,982.5**	**135,615.0**		**5,656,812**	**1.00000000000**			**32,082.2**	**1.000000000**	**1.00000000000**

TABLE NO. 3: Well List and Status

UWI	License Number	Rig Release Date	Type	Pool Name	Producing Zone	Mode	On Prod Date	Prod Date	Cal Dly Oil (m3/d)	Monthly Oil (m3)	Cum Prd Oil (m3)	Cal Dly Water (m3/d)	Monthly Water (m3)	Cum Prd Water (m3)	Cal Dly Gas (E3m3/d)	Monthly Gas (E3m3)	Cum Prd Gas (E3m3)	WCT (%)
100/01-09-001-24W1/0	005290	7/22/2004	Vertical	LOWER AMARANTH I	AMRNTHL	Producing	8/8/2004	Aug-2011	0.2	5.2	1922.9	0.2	5.6	930.1	0.0	0.0	0.0	51.85
102/01-09-001-24W1/0	007582	10/7/2010	Horizontal	LOWER AMARANTH I	AMRNTHL	Producing	1/20/2011	Jul-2016	0.7	21.2	3761.8	0.7	22.3	3156.8	0.0	0.0	242.0	51.26
103/01-09-001-24W1/0	007583	10/12/2010	Horizontal	LOWER AMARANTH I	AMRNTHL	Producing	9/16/2011	Jul-2016	0.7	20.3	4545.7	1.2	38.7	5679.6	0.0	0.0	208.5	65.59
104/01-09-001-24W1/0	009001	10/25/2012	Horizontal	LOWER AMARANTH I	AMRNTHL	Producing	12/15/2012	Jul-2016	0.3	10.4	4187.0	3.8	117.8	9104.4	0.0	0.0	238.7	91.89
100/02-09-001-24W1/0	005296	7/19/2004	Vertical	LOWER AMARANTH I	AMRNTHL	Producing	8/24/2004	Nov-2011	0.1	3.4	3244.8	0.1	1.8	991.6	0.0	0.0	0.0	34.62
102/02-09-001-24W1/0	006999	8/9/2009	Horizontal	LOWER AMARANTH I	AMRNTHL	Producing	9/4/2009	Jul-2016	0.1	4.6	8547.5	0.2	5.3	6330.4	0.0	0.0	101.2	53.54
103/02-09-001-24W1/0	009884	8/15/2014	Horizontal	LOWER AMARANTH I	AMRNTHL	Producing	9/17/2014	Jul-2016	0.6	18.0	1987.4	1.3	41.2	3417.3	0.0	0.0	141.9	69.59
100/03-09-001-24W1/0	005286	9/20/2004	Vertical	LOWER AMARANTH I	AMRNTHL	Producing	10/8/2004	Jul-2016	0.3	8.8	4595.5	0.0	1.1	1223.8	0.0	0.0	298.9	11.11
100/04-09-001-24W1/0	005297	9/18/2004	Vertical	LOWER AMARANTH I	AMRNTHL	Producing	10/8/2004	Jul-2016	0.4	12.5	5102.0	0.0	0.8	1096.5	0.0	0.0	16.8	6.02
102/04-09-001-24W1/0	006830	11/21/2008	Horizontal	LOWER AMARANTH I	AMRNTH	Producing	1/27/2009	Jul-2016	0.7	20.6	6895.6	0.4	12.7	3264.8	0.0	0.0	196.2	38.14
103/04-09-001-24W1/0	007584	10/23/2010	Horizontal	LOWER AMARANTH I	AMRNTHL	Producing	12/22/2010	Jul-2016	0.4	11.4	4986.3	0.0	0.7	2564.4	0.0	0.0	195.1	5.79
100/05-09-001-24W1/0	005216	9/21/2003	Vertical	LOWER AMARANTH I	AMRNTHL	Producing	10/11/2003	Apr-2016	0.1	2.5	2100.4	0.2	5.4	4586.8	0.0	0.0	16.1	68.35
102/05-09-001-24W1/0	007585	10/28/2010	Horizontal	LOWER AMARANTH I	AMRNTHL	Producing	12/22/2010	Jul-2016	0.5	16.0	6584.0	0.2	5.6	4152.6	0.0	0.0	164.4	25.93
103/05-09-001-24W1/0	007586	11/3/2010	Horizontal	LOWER AMARANTH I	AMRNTHL	Producing	12/23/2010	Jul-2016	0.1	3.4	3399.8	0.0	0.1	3646.7	0.0	0.0	125.0	2.86
100/06-09-001-24W1/0	005287	7/16/2004	Vertical	LOWER AMARANTH I	AMRNTHL	Producing	8/10/2004	Apr-2016	0.3	7.5	2913.7	0.1	2.3	1386.9	0.0	0.0	0.0	23.47
102/06-09-001-24W1/0	008536	2/16/2012	Horizontal	LOWER AMARANTH I	AMRNTHL	Producing	5/11/2012	Jul-2016	0.5	16.9	4930.8	0.6	18.3	4349.9	0.0	0.0	213.1	51.99
103/06-09-001-24W1/2	009902	9/4/2014	Horizontal	LOWER AMARANTH I	AMRNTHL	Producing	10/9/2014	Jul-2016	0.6	19.2	2447.4	0.9	26.8	2817.6	0.0	0.0	169.7	58.26
100/07-09-001-24W1/0	005293	7/5/2004	Vertical	LOWER AMARANTH I	AMRNTHL	Producing	7/17/2004	Mar-2014	0.3	9.4	3371.7	0.8	24.1	4628.7	0.1	3.5	69.0	71.94
100/08-09-001-24W1/0	004975	6/28/2001	Vertical	LOWER AMARANTH I	AMRNTHL	Pumping	7/14/2001	Feb-2016	0.0	0.9	4300.2	0.0	0.3	2139.0	0.0	0.0	22.3	25.00
102/08-09-001-24W1/0	007587	10/18/2010	Horizontal	LOWER AMARANTH I	AMRNTHL	Producing	1/16/2011	Jul-2016	0.7	22.9	5248.0	0.7	22.6	3057.5	0.0	0.0	159.9	49.67
103/08-09-001-24W1/0	009881	6/22/2014	Horizontal	LOWER AMARANTH I	AMRNTHL	Producing	8/22/2014	Jul-2016	1.3	40.9	2257.6	1.3	39.0	2037.8	0.0	0.0	99.4	48.81
104/08-09-001-24W1/0	009882	6/27/2014	Horizontal	LOWER AMARANTH I	AMRNTHL	Producing	8/23/2014	Jul-2016	2.5	78.9	2816.1	39.3	1219.3	23466.4	0.0	0.0	131.0	93.92
100/09-09-001-24W1/0	005277	6/29/2004	Vertical	LOWER AMARANTH I	AMRNTHL	Producing	7/14/2004	Nov-2012	1.7	49.9	4515.4	1.1	34.4	3395.9	0.0	0.0	0.0	40.81
102/09-09-001-24W1/0	009883	7/24/2014	Horizontal	LOWER AMARANTH I	AMRNTHL	Producing	9/1/2014	Jul-2016	2.1	66.3	3890.5	6.2	192.5	7930.2	0.0	0.0	240.1	74.38
100/10-09-001-24W1/0	005278	7/2/2004	Vertical	LOWER AMARANTH I	AMRNTHL	Producing	7/16/2004	Jan-2009	0.0	0.0	886.0	0.6	19.1	61007.5	0.0	0.0	0.0	100.00
102/10-09-001-24W1/0	008603	3/2/2012	Horizontal	LOWER AMARANTH I	AMRNTHL	Producing	7/10/2012	Jul-2016	0.1	2.1	1766.5	4.0	124.1	30644.4	0.0	0.0	110.0	98.34
100/11-09-001-24W1/0	005288	7/14/2004	Vertical	LOWER AMARANTH I	AMRNTHL	Producing	8/10/2004	May-2011	0.0	1.4	2229.5	0.0	0.3	1747.5	0.0	0.0	0.0	17.65
102/11-09-001-24W1/0	009903	8/25/2014	Horizontal	LOWER AMARANTH I	AMRNTHL	Producing	10/10/2014	Jul-2016	0.6	18.6	2227.4	2.9	88.5	4482.3	0.0	0.0	127.1	82.63
100/12-09-001-24W1/0	005291	7/10/2004	Vertical	LOWER AMARANTH I	AMRNTHL	Producing	8/10/2004	Sep-2014	0.2	4.5	2825.6	0.5	14.4	1091.0	0.0	0.0	3.2	76.19
102/12-09-001-24W1/0	008606	6/4/2012	Horizontal	LOWER AMARANTH I	AMRNTHL	Producing	8/3/2012	Jul-2016	0.7	22.8	5470.5	1.1	35.6	5830.3	0.0	0.0	105.9	60.96
100/13-09-001-24W1/0	005217	9/19/2003	Vertical	LOWER AMARANTH I	AMRNTHL	Producing	10/3/2003	May-2009	0.1	3.3	2074.6	7.5	232.5	5918.3	0.0	0.0	0.0	98.60
100/14-09-001-24W1/0	005289	7/7/2004	Vertical	LOWER AMARANTH I	AMRNTHL	Producing	8/10/2004	Dec-2014	0.1	3.1	4293.2	0.2	5.9	2009.7	0.0	0.0	299.7	65.56
102/14-09-001-24W1/0	008601	3/8/2012	Horizontal	LOWER AMARANTH I	AMRNTHL	Producing	7/13/2012	Jul-2016	3.3	101.5	4542.6	72.3	2241.9	61097.5	0.0	0.0	130.3	95.67
103/14-09-001-24W1/0	008602	5/28/2012	Horizontal	LOWER AMARANTH I	AMRNTHL	Producing	8/5/2012	Jul-2016	0.7	23.1	3939.6	0.2	7.4	2822.5	0.0	0.0	101.2	24.26
102/01-10-001-24W1/0	007730	2/15/2011	Horizontal	LOWER AMARANTH I	AMRNTHL	Producing	8/1/2011	Jul-2016	2.1	64.6	9293.4	2.0	61.6	6863.8	0.0	0.0	115.0	48.81
100/02-10-001-24W1/0	005304	8/1/2004	Vertical	LOWER AMARANTH I	AMRNTHL	Producing	8/9/2004	Nov-2014	0.2	5.9	2870.7	0.3	8.4	2110.4	0.0	0.0	123.2	58.74
100/03-10-001-24W1/0	005300	7/27/2004	Vertical	LOWER AMARANTH I	AMRNTHL	Abandoned Zone	8/12/2004	Apr-2015	0.1	1.7	2410.5	0.0	0.0	1111.0	0.2	5.6	9.1	0.00
102/03-10-001-24W1/0	009002	10/19/2012	Horizontal	LOWER AMARANTH I	AMRNTHL	Producing	12/15/2012	May-2016	0.7	21.9	7179.3	1.1	32.6	9609.5	0.0	0.0	528.1	59.82
100/04-10-001-24W1/0	005301	7/24/2004	Vertical	LOWER AMARANTH I	AMRNTHL	Producing	8/8/2004	Jan-2015	0.0	0.1	3013.2	0.0	0.1	1451.2	0.0	0.0	74.8	50.00
102/04-10-001-24W1/0	007712	2/7/2011	Horizontal	LOWER AMARANTH I	AMRNTHL	Producing	8/16/2011	Jul-2016	0.7	22.0	8391.5	0.2	5.8	5118.0	0.0	0.0	92.3	20.86
103/04-10-001-24W1/0	007802	2/21/2011	Horizontal	LOWER AMARANTH I	AMRNTHL	Producing	9/28/2011	Jul-2016	0.4	11.0	6460.4	0.0	1.4	3567.7	0.0	0.0	83.9	11.29
100/05-10-001-24W1/0	005120	10/1/2002	Dir/Dev	LOWER AMARANTH I	AMRNTHL	Producing	10/16/2002	Jul-2016	0.2	7.5	6160.9	0.0	0.3	2666.2	0.0	0.0	160.3	3.85
102/05-10-001-24W1/0	007803	2/27/2011	Horizontal	LOWER AMARANTH I	AMRNTHL	Producing	9/28/2011	Jul-2016	0.4	13.5	8154.5	0.0	1.4	4028.3	0.0	0.0	176.4	9.40
103/05-10-001-24W1/0	009070	1/31/2013	Horizontal	LOWER AMARANTH I	AMRNTHL	Producing	3/10/2013	Jul-2016	0.3	8.2	3921.1	1.9	58.5	5999.3	0.0	0.0	225.8	87.71
105/05-10-001-24W1/0	009895	9/30/2014	Horizontal	LOWER AMARANTH I	AMRNTHL	Producing	10/25/2014	Apr-2016	0.3	9.7	2091.1	0.4	11.8	2223.5	0.0	0.0	328.0	54.88
100/06-10-001-24W1/0	004959	6/11/2001	Vertical	LOWER AMARANTH I	AMRNTHL	Pumping	6/17/2001	Apr-2016	0.0	1.0	4129.8	0.0	0.0	1623.7	0.0	0.0	56.9	0.00
100/11-10-001-24W1/0	005121	10/8/2002	Dir/Dev	LOWER AMARANTH I	AMRNTHL	Producing	10/15/2002	Sep-2013	1.3	39.1	5127.9	0.0	0.0	4070.3	0.0	0.0	0.7	0.00
102/11-10-001-24W1/0	007588	11/16/2010	Horizontal	LOWER AMARANTH I	AMRNTHL	Producing	12/23/2010	Jul-2016	1.1	33.1	6227.9	0.2	6.2	3353.7	0.0	0.0	79.3	15.78
100/12-10-001-24W1/0	005122	10/5/2002	Dir/Dev	LOWER AMARANTH I	AMRNTHL	Pumping	10/15/2002	Feb-2013	0.1	1.4	4574.9	1.2	32.9	16507.3	0.0	0.5	3.7	95.92
102/12-10-001-24W1/0	009069	1/17/2013	Horizontal	LOWER AMARANTH I	AMRNTHL	Producing	3/11/2013	Jul-2016	0.5	14.6	5871.7	3.3	103.7	7283.4	0.0	0.0	339.9	87.66
103/12-10-001-24W1/0	009139	2/18/2013	Horizontal	LOWER AMARANTH I	AMRNTHL	Producing	4/1/2013	Jul-2016	0.4	12.3	1226.8	2.2	69.4	3108.2	0.0	0.0	87.6	84.94
104/12-10-001-24W1/0	009201	2/23/2013	Horizontal	LOWER AMARANTH I	AMRNTHL	Producing	3/22/2013	Jul-2016	0.4	11.7	5078.3	1.5	45.6	5878.5	0.0	0.0	329.2	79.58
100/13-10-001-24W1/0	004624	11/19/1996	Vertical	LOWER AMARANTH I	AMRNTHL	Producing	1/14/1997	Sep-2015	0.0	0.8	6579.0	0.0	0.3	2792.8	0.0	0.0	17.3	27.27
102/13-10-001-24W1/0	009140	2/5/2013	Horizontal	LOWER AMARANTH I	AMRNTHL	Producing	3/14/2013	Jul-2016	0.9	28.7	1128.5	57.4	1779.3	39064.3	0.0	0.0	65.1	98.41
103/13-10-001-24W1/0	009153	2/11/2013	Horizontal	LOWER AMARANTH I	AMRNTHL	Producing	3/15/2013	Jul-2016	5.1	157.4	4980.0	20.0	620.2	20021.4	0.0	0.0	158.6	79.76
100/14-10-001-24W1/0	005272	6/11/2004	Vertical	LOWER AMARANTH I	AMRNTHL	Producing	7/9/2004	Oct-2014	0.4	12.9	4850.0	0.4	12.8	3313.5	0.0	0.0	378.2	49.81
100/03-11-001-24W1/0	007188	1/22/2010	Horizontal	LOWER AMARANTH I	AMRNTHL	Producing	3/12/2010	Jul-2016	0.9	26.4	11356.5	3.2	99.1	13835.7	0.0	0.0	184.9	78.96
102/03-11-001-24W1/0	008345	11/22/2011	Horizontal	LOWER AMARANTH I	AMRNTHL	Producing	1/23/2012	Jul-2016	0.3	10.5	3496.7	2.1	65.0	6452.0	0.0	0.0	136.2	86.09
100/05-14-001-24W1/0	005117	9/28/2002	Vertical	LOWER AMARANTH I	AMRNTHL	Pumping	10/18/2002	Jul-2016	0.4	12.7	5482.0	0.3	9.9	4259.4	0.0	0.0	16.6	43.81
100/06-14-001-24W1/0	004933	1/12/2001	Vertical	LOWER AMARANTH I	AMRNTHL	Producing	2/1/2001	Jun-2010	0.0	0.0	2640.4	3.9	115.5	79954.8	0.0	0.0	0.0	100.00
102/06-14-001-24W1/0	009011	10/31/2012	Horizontal	LOWER AMARANTH I	AMRNTHL	Producing	12/4/2012	Jul-2016	4.5	138.5	5693.1	32.1	995.4	36903.2	0.0	0.0	165.2	87.79

UWI	License Number	Rig Release Date	Type	Pool Name	Producing Zone	Mode	On Prod Date	Prod Date	Cal Dly Oil (m3/d)	Monthly Oil (m3)	Cum Prd Oil (m3)	Cal Dly Water (m3/d)	Monthly Water (m3)	Cum Prd Water (m3)	Cal Dly Gas (E3m3/d)	Monthly Gas (E3m3)	Cum Prd Gas (E3m3)	WCT (%)	
100/11-14-001-24W1/0	005322	8/26/2004	Vertical	LOWER AMARANTH I	AMRNTHL	Producing	9/5/2004	Oct-2013	0.0	0.6	2018.6	0.0	0.1	899.5	0.0	0.0	17.3	14.29	
102/11-14-001-24W1/0	007194	2/4/2010	Horizontal	LOWER AMARANTH I	AMRNTH	Producing	3/19/2010	Apr-2016	0.3	7.8	5992.9	0.1	3.1	3487.1	0.0	0.0	61.1	28.44	
100/12-14-001-24W1/0	004967	7/1/2001	Vertical	LOWER AMARANTH I	AMRNTHL	Pumping	7/14/2001	Nov-2014	0.1	2.6	4963.0	0.0	0.3	1173.1	0.0	0.0	62.2	10.34	
102/12-14-001-24W1/0	008525	2/2/2012	Horizontal	LOWER AMARANTH I	AMRNTHL	Producing	3/9/2012	Jul-2016	0.6	20.1	7489.3	0.3	9.8	4320.7	0.0	0.0	207.8	32.78	
103/12-14-001-24W1/0	009420	10/21/2014	Horizontal	LOWER AMARANTH I	AMRNTHL	Producing	11/29/2014	Jul-2016	0.6	18.6	1047.8	0.2	6.8	1032.1	0.0	0.0	33.6	26.77	
104/12-14-001-24W1/0	009421	10/25/2014	Horizontal	LOWER AMARANTH I	AMRNTHL	Producing	12/3/2014	Jul-2016	0.6	18.1	1400.0	0.2	6.0	1135.0	0.0	0.0	70.0	24.90	
100/13-14-001-24W1/0	008514	1/26/2012	Horizontal	LOWER AMARANTH I	AMRNTHL	Producing	3/8/2012	Jul-2016	0.9	28.2	8935.8	2.0	62.4	6612.6	0.0	0.0	259.3	68.87	
102/13-14-001-24W1/0	009423	7/31/2014	Horizontal	LOWER AMARANTH I	AMRNTHL	Producing	9/16/2014	Jul-2016	0.8	25.1	2567.3	0.4	11.8	1666.5	0.0	0.0	44.0	31.98	
103/13-14-001-24W1/0	009424	8/4/2014	Horizontal	LOWER AMARANTH I	AMRNTHL	Producing	9/14/2014	Jul-2016	0.5	15.1	1939.7	0.3	8.7	1677.7	0.0	0.0	80.0	36.55	
104/13-14-001-24W1/0	009425	8/9/2014	Horizontal	LOWER AMARANTH I	AMRNTHL	Producing	9/15/2014	Jul-2016	0.5	16.0	1931.4	0.2	7.3	1581.9	0.0	0.0	58.4	31.33	
100/14-14-001-24W1/0	005323	8/17/2004	Vertical	LOWER AMARANTH I	AMRNTHL	Producing	9/5/2004	Nov-2015	0.1	3.8	3444.5	0.0	1.0	1056.8	0.0	0.0	0.0	20.83	
102/14-14-001-24W1/0	008923	11/12/2012	Horizontal	LOWER AMARANTH I	AMRNTHL	Producing	12/7/2012	Jul-2016	0.7	20.2	4428.7	1.3	39.2	7436.0	0.0	0.0	67.8	65.99	Prodn will be pro-rated between unit and non-unit LSDs
100/15-14-001-24W1/0	005324	8/19/2004	Vertical	LOWER AMARANTH I	AMRNTHL	Producing	9/5/2004	Nov-2014	0.3	7.5	3430.7	0.2	4.5	1343.0	0.0	0.0	18.3	37.50	
100/16-14-001-24W1/0	005325	8/22/2004	Vertical	LOWER AMARANTH I	AMRNTHL	Producing	9/5/2004	Sep-2014	0.0	0.1	3225.2	0.0	0.0	1068.9	0.0	0.0	51.8	0.00	
103/16-14-001-24W1/0	008699	6/16/2012	Horizontal	LOWER AMARANTH I	AMRNTHL	Producing	8/21/2012	Jul-2016	0.5	14.4	4208.4	24.7	764.5	31542.7	0.0	0.0	129.7	98.15	
104/16-14-001-24W1/0	009946	10/30/2014	Horizontal	LOWER AMARANTH I	AMRNTHL	Producing	12/6/2014	Jul-2016	1.0	32.1	1786.5	0.3	10.7	1056.7	0.0	0.0	35.0	25.00	
105/16-14-001-24W1/0	009947	11/5/2014	Horizontal	LOWER AMARANTH I	AMRNTHL	Producing	12/5/2014	Jul-2016	0.7	22.4	860.7	0.5	14.8	705.2	0.0	0.0	18.3	39.78	Prodn will be pro-rated between unit and non-unit LSDs
100/04-15-001-24W1/0	004763	11/9/1997	Horizontal	LOWER AMARANTH I	AMRNTHL	Producing	11/25/1997	Apr-2015	0.1	1.9	9652.5	3.2	94.8	91377.2	0.0	0.0	21.0	98.04	Prodn will be pro-rated between unit and non-unit LSDs
102/04-15-001-24W1/0	009429	8/8/2013	Horizontal	LOWER AMARANTH I	AMRNTHL	Producing	9/22/2013	Jul-2016	4.1	127.4	4984.1	10.0	310.8	13456.9	0.0	0.0	167.5	70.93	
103/04-15-001-24W1/0	009430	8/12/2013	Horizontal	LOWER AMARANTH I	AMRNTHL	Producing	9/18/2013	Jul-2016	0.8	26.2	5627.1	2.9	91.2	9304.3	0.0	0.0	208.5	77.68	
100/05-15-001-24W1/0	005341	9/23/2004	Vertical	LOWER AMARANTH I	AMRNTHL	Producing	10/8/2004	Jul-2014	0.1	2.0	4579.4	0.0	0.8	1654.4	0.0	0.0	22.0	28.57	
102/05-15-001-24W1/0	009355	6/22/2013	Horizontal	LOWER AMARANTH I	AMRNTHL	Producing	8/25/2013	Jul-2016	0.8	25.9	4375.2	0.4	13.3	3088.5	0.0	0.0	245.4	33.93	
103/05-15-001-24W1/0	009356	6/29/2013	Horizontal	LOWER AMARANTH I	AMRNTHL	Producing	8/12/2013	Jul-2015	0.0	1.1	3773.0	0.0	0.1	2109.6	0.1	2.0	194.3	8.33	
104/05-15-001-24W1/0	009357	7/4/2013	Horizontal	LOWER AMARANTH I	AMRNTHL	Producing	8/11/2013	Jul-2016	0.7	21.4	2918.1	0.4	12.2	1851.7	0.0	0.0	159.5	36.31	
105/05-15-001-24W1/0	009436	8/4/2013	Horizontal	LOWER AMARANTH I	AMRNTHL	Producing	9/20/2013	Jul-2016	0.2	7.0	5005.1	3.5	108.6	6519.4	0.0	0.0	138.7	93.94	
100/06-15-001-24W1/0	005319	8/12/2004	Vertical	LOWER AMARANTH I	AMRNTHL	Producing	9/4/2004	Mar-2015	0.0	0.1	2926.8	0.0	0.0	639.9	0.0	0.0	0.0	0.00	
100/07-15-001-24W1/0	005320	8/15/2004	Vertical	LOWER AMARANTH I	AMRNTHL	Producing	9/4/2004	Jul-2014	0.6	18.6	2863.2	0.1	2.8	722.2	0.0	0.0	80.1	13.08	
102/07-15-001-24W1/0	007007	7/30/2009	Horizontal	LOWER AMARANTH I	AMRNTHL	Producing	9/4/2009	Jul-2016	0.4	13.2	9495.0	0.1	2.7	4842.8	0.0	0.0	81.5	16.98	
103/07-15-001-24W1/0	009886	8/20/2014	Horizontal	LOWER AMARANTH I	AMRNTHL	Producing	10/16/2014	Jul-2016	0.3	10.4	906.1	0.4	12.7	1248.5	0.0	0.0	60.9	54.98	
100/08-15-001-24W1/0	005118	9/24/2002	Vertical	LOWER AMARANTH I	AMRNTHL	Abandoned Zone	10/16/2002	Jul-2011	0.2	5.4	4121.8	0.1	2.2	1386.8	0.0	0.0	0.0	28.95	
100/09-15-001-24W1/0	005315	8/7/2004	Vertical	LOWER AMARANTH I	AMRNTHL	Producing	9/4/2004	Jul-2016	0.2	4.9	3223.6	0.0	0.7	1214.7	0.0	0.0	89.6	12.50	
100/10-15-001-24W1/0	004964	6/15/2001	Vertical	LOWER AMARANTH I	AMRNTHL	Pumping	6/21/2001	Jul-2016	0.4	11.8	3142.9	1.3	39.1	14387.5	0.0	0.0	47.7	76.82	
102/10-15-001-24W1/0	008472	1/11/2012	Horizontal	LOWER AMARANTH I	AMRNTHL	Producing	3/16/2012	Jun-2016	0.0	0.4	3916.2	0.0	0.2	2138.4	0.0	0.0	271.2	33.33	
100/11-15-001-24W1/0	005316	8/9/2004	Vertical	LOWER AMARANTH I	AMRNTHL	Producing	9/4/2004	Aug-2012	0.1	1.8	1793.3	0.0	0.6	884.3	0.0	0.0	0.0	25.00	
100/12-15-001-24W1/0	005218	9/11/2003	Vertical	LOWER AMARANTH I	AMRNTHL	Producing	10/3/2003	Jul-2016	0.3	9.4	3667.2	0.2	7.4	3493.1	0.0	0.0	270.7	44.05	
102/12-15-001-24W1/0	006822	11/12/2008	Horizontal	LOWER AMARANTH I	AMRNTHL	Producing	1/29/2009	Mar-2016	0.2	5.1	5495.2	1.3	39.1	7789.7	0.0	0.0	32.0	88.46	
103/12-15-001-24W1/0	007154	1/14/2010	Horizontal	LOWER AMARANTH I	AMRNTHL	Producing	3/10/2010	Jul-2016	0.1	4.0	8528.7	0.6	19.5	7443.8	0.0	0.0	150.1	82.98	
104/12-15-001-24W1/0	008585	2/24/2012	Horizontal	LOWER AMARANTH I	AMRNTHL	Producing	4/4/2012	Jul-2016	0.3	8.8	3560.1	0.4	11.7	2728.0	0.0	0.0	49.8	57.07	
105/12-15-001-24W1/0	009337	N/A	Horizontal	LOWER AMARANTH I	AMRNTHL	Producing	8/2/2013	Jul-2016	0.6	17.3	1709.6	0.3	8.9	1333.2	0.0	0.0	108.6	33.97	
100/13-15-001-24W1/0	008576	2/23/2012	Horizontal	LOWER AMARANTH I	AMRNTHL	Producing	6/8/2012	Jul-2016	0.3	7.8	4697.1	1.1	33.9	7260.5	0.0	0.0	111.9	81.29	
102/13-15-001-24W1/0	009383	7/13/2013	Horizontal	LOWER AMARANTH I	AMRNTHL	Producing	8/15/2013	Jul-2016	0.1	2.5	4849.7	0.1	4.1	4754.4	0.0	0.0	189.1	62.12	
103/13-15-001-24W1/0	009384	7/9/2013	Horizontal	LOWER AMARANTH I	AMRNTHL	Producing	8/15/2013	Jul-2016	0.6	17.9	4424.0	0.3	10.0	2455.8	0.0	0.0	188.5	35.84	
100/14-15-001-24W1/0	009055	1/10/2013	Horizontal	LOWER AMARANTH I	AMRNTHL	Producing	2/26/2013	Apr-2016	0.7	19.5	2853.0	0.3	8.2	4210.6	0.0	0.0	53.0	29.60	
100/15-15-001-24W1/0	008471	1/19/2012	Horizontal	LOWER AMARANTH I	AMRNTHL	Producing	3/18/2012	Apr-2016	0.0	0.8	3320.6	0.0	0.9	2857.2	0.0	0.0	138.3	52.94	
100/16-15-001-24W1/0	009107	3/9/2013	Horizontal	LOWER AMARANTH I	AMRNTHL	Producing	3/27/2013	Jul-2016	1.8	55.1	5568.3	1.1	34.5	6429.4	0.0	0.0	179.2	38.50	
102/16-15-001-24W1/0	009431	7/19/2013	Horizontal	LOWER AMARANTH I	AMRNTHL	Producing	8/19/2013	Jul-2016	1.1	33.2	4165.8	1.7	52.0	4001.0	0.0	0.0	134.7	61.03	
103/16-15-001-24W1/0	009432	7/25/2013	Horizontal	LOWER AMARANTH I	AMRNTHL	Producing	8/21/2013	Jul-2016	1.0	31.8	5252.7	0.4	13.1	2096.4	0.0	0.0	154.4	29.18	
104/16-15-001-24W1/0	009433	7/30/2013	Horizontal	LOWER AMARANTH I	AMRNTHL	Producing	8/20/2013	Jul-2016	1.3	39.8	4803.8	31.3	969.6	34883.5	0.0	0.0	183.8	96.06	
100/03-16-001-24W1/0	006405	10/9/2007	Horizontal	LOWER AMARANTH I	AMRNTHL	Abandoned Zone	12/2/2007	Jun-2012	0.0	0.0	1557.2	21.1	633.0	4048.9	0.0	0.0	0.0	100.00	
102/03-16-001-24W1/0	007122	10/10/2010	Horizontal	LOWER AMARANTH I	AMRNTHL	Producing	11/15/2010	Jul-2016	4.1	126.9	11642.9	38.9	1205.5	99178.2	0.0	0.8	531.0	90.48	
102/02-22-001-24W1/0	008202	11/14/2011	Horizontal	LOWER AMARANTH I	AMRNTHL	Producing	1/16/2012	Jul-2016	0.7	20.3	8523.4	7.0	216.2	16593.1	0.0	0.0	67.1	91.42	Prodn will be pro-rated between unit and non-unit LSDs
											484790.9			**1011357.2**					

Table No. 4: OOIP Calculation

LSD	OOIP (bbls)	OOIP (m3)
1-9-1-24W1	762430	121217
2-9-1-24W1	773900	123040
3-9-1-24W1	784340	124700
4-9-1-24W1	789510	125522
5-9-1-24W1	794290	126282
6-9-1-24W1	790190	125630
7-9-1-24W1	779180	123880
8-9-1-24W1	764640	121568
9-9-1-24W1	781870	124307
10-9-1-24W1	793410	126142
11-9-1-24W1	798050	126880
12-9-1-24W1	801320	127400
13-9-1-24W1	813090	129271
14-9-1-24W1	805950	128136
1-10-1-24W1	692620	110118
2-10-1-24W1	731540	116306
3-10-1-24W1	755070	120047
4-10-1-24W1	761120	121008
5-10-1-24W1	768610	122199
6-10-1-24W1	769760	122382
11-10-1-24W1	774230	123093
12-10-1-24W1	777250	123573
13-10-1-24W1	778890	123834
14-10-1-24W1	762570	121239
3-11-1-24W1	704510	112008
4-11-1-24W1	694600	110433

LSD	OOIP (bbls)	OOIP (m3)
5-14-1-24W1	767950	122094
6-14-1-24W1	762640	121250
11-14-1-24W1	753520	119800
12-14-1-24W1	763780	121431
13-14-1-24W1	760080	120843
14-14-1-24W1	750490	119318
15-14-1-24W1	744210	118320
16-14-1-24W1	755800	120163
3-15-1-24W1	766280	121829
4-15-1-24W1	783700	124598
5-15-1-24W1	791790	125885
6-15-1-24W1	778100	123708
7-15-1-24W1	767690	122053
8-15-1-24W1	769200	122293
9-15-1-24W1	768870	122241
10-15-1-24W1	769600	122357
11-15-1-24W1	779200	123883
12-15-1-24W1	791150	125783
13-15-1-24W1	799940	127180
14-15-1-24W1	781230	124206
15-15-1-24W1	770280	122465
16-15-1-24W1	766090	121799
3-16-1-24W1	804490	127904
4-16-1-24W1	810100	128796
TOTAL	**38559120**	**6130410**

Sw = 40%
Porosity = 10%
Bo = 1.17

Table No. 5

Proposed Goodlands Unit No. 3

LOWER AMARANTH FORMATION ROCK & FLUID PARAMETERS

Formation Pressure	8500 kPa	Initial Average Reservoir Pressure
Formation Temperature	45 C	
Saturation Pressure	4220 kPa	Bubble Point
GOR	20 - 50 m3/m3	Gas Oil Ratio
API Oil Gravity	37.2	
Swi (fraction)	0.40	Initial Water Saturation
Produced Water Specific Gravity	1.08	
Produced Water pH	7.1 - 7.3	
Produced Water TDS	180,000	
Wettability	Moderately oil-wet	

00/04-09-001-24W1/0

KB: 499.4 m RR: 2004-09-18
TD: 920.0 m [TVD] FormTD: AMRNTHL
Mode: Prod Fluid: Oil
TUNDRA WASKADA 4-9-1-24(WPM)
933.8m to next well >

00/07-09-001-24W1/0

KB: 513.2 m RR: 2004-07-05
TD: 930.0 m [TVD] FormTD: TILSTNBD
Mode: Prod Fluid: Oil
TUNDRA WASKADA 7-9-1-24 (WPM)
< 933.8m to previous well 541.4m to next well >

00/09-09-001-24W1/0

KB: 514.9 m RR: 2004-06-29
TD: 928.0 m [TVD] FormTD: TILSTNBD
Mode: Prod Fluid: Oil
TUNDRA WASKADA 9-9-1-24 (WPM)
< 541.4m to previous well 716.9m to next well >

00/13-10-001-24W1/0

KB: 520.1 m RR: 1996-11-19
TD: 985.0 m [TVD] FormTD: LODGEPOL
Mode: Prod Fluid: Oil
TUNDRA ET AL GOODLANDS 13-10-1-24
< 716.9m to previous well 1059.0m to next well >

00/07-15-001-24W1/0

KB: 519.8 m RR: 2004-08-15
TD: 925.0 m [TVD] FormTD: AMRNTHL
Mode: Prod Fluid: Oil
TUNDRA WASKADA 7-15-1-24(WPM)
< 1059.0m to previous well 564.9m to next well >

00/09-15-001-24W1/0

KB: 522.6 m RR: 2004-08-07
TD: 925.0 m [TVD] FormTD: AMRNTHL
Mode: Prod Fluid: Oil
TUNDRA WASKADA 9-15-1-24(WPM)
< 564.9m to previous well 952.8m to next well >

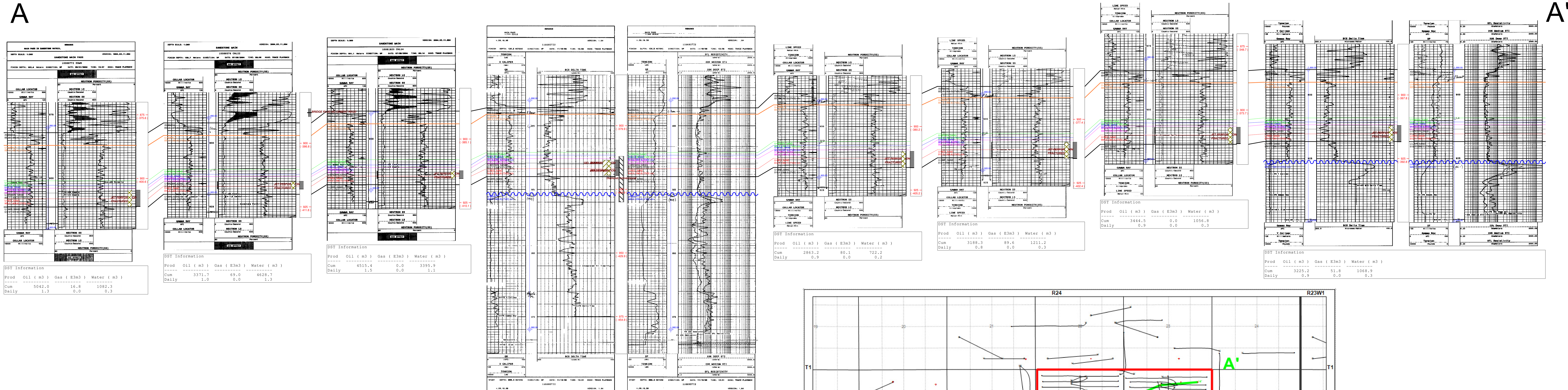
00/14-14-001-24W1/0

KB: 526.3 m RR: 2004-08-17
TD: 922.0 m [TVD] FormTD: AMRNTHL
Mode: Prod Fluid: Oil
TUNDRA WASKADA 14-14-1-24(WPM)
< 952.8m to previous well 700.2m to next well >

00/16-14-001-24W1/0

KB: 532.2 m RR: 2004-08-22
TD: 949.0 m [TVD] FormTD: TILSTNBD
Mode: Prod Fluid: Oil
TUNDRA WASKADA 16-14-1-24(WPM)
< 700.2m to previous well

A A'



DST Information (00/04-09-001-24W1/0)

Prod	Oil (m3)	Gas (E3m3)	Water (m3)
Cum	5042.0	16.8	1082.3
Daily	1.3	0.0	0.3

DST Information (00/07-09-001-24W1/0)

Prod	Oil (m3)	Gas (E3m3)	Water (m3)
Cum	3371.7	69.0	4628.7
Daily	1.0	0.0	1.3

DST Information (00/09-09-001-24W1/0)

Prod	Oil (m3)	Gas (E3m3)	Water (m3)
Cum	4515.4	0.0	3395.9
Daily	1.5	0.0	1.1

DST Information (00/13-10-001-24W1/0)

Prod	Oil (m3)	Gas (E3m3)	Water (m3)
Cum	6579.0	17.3	2792.8
Daily	1.0	0.0	0.4

DST Information (00/07-15-001-24W1/0)

Prod	Oil (m3)	Gas (E3m3)	Water (m3)
Cum	2863.2	80.1	722.2
Daily	0.9	0.0	0.2

DST Information (00/09-15-001-24W1/0)

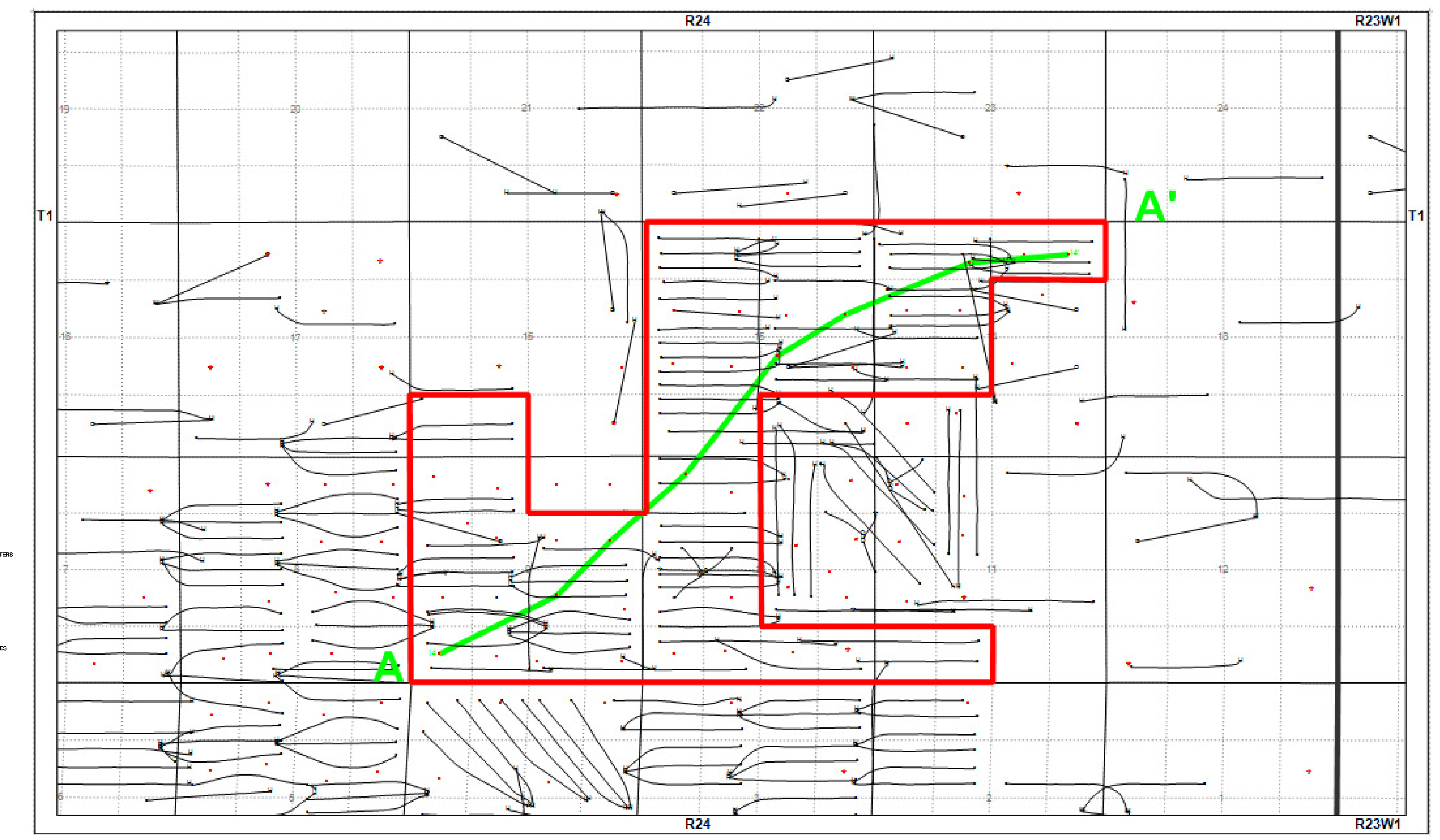
Prod	Oil (m3)	Gas (E3m3)	Water (m3)
Cum	3188.3	89.6	1211.2
Daily	0.8	0.0	0.3

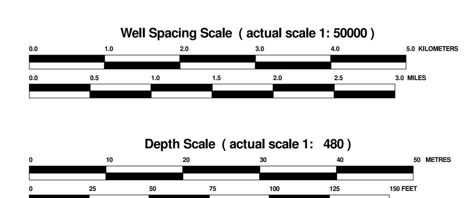
DST Information (00/14-14-001-24W1/0)

Prod	Oil (m3)	Gas (E3m3)	Water (m3)
Cum	3444.5	0.0	1056.8
Daily	0.9	0.0	0.3

DST Information (00/16-14-001-24W1/0)

Prod	Oil (m3)	Gas (E3m3)	Water (m3)
Cum	3225.2	51.8	1068.9
Daily	0.9	0.0	0.3





Tundra

Goodlands Unit 3 Cross Section

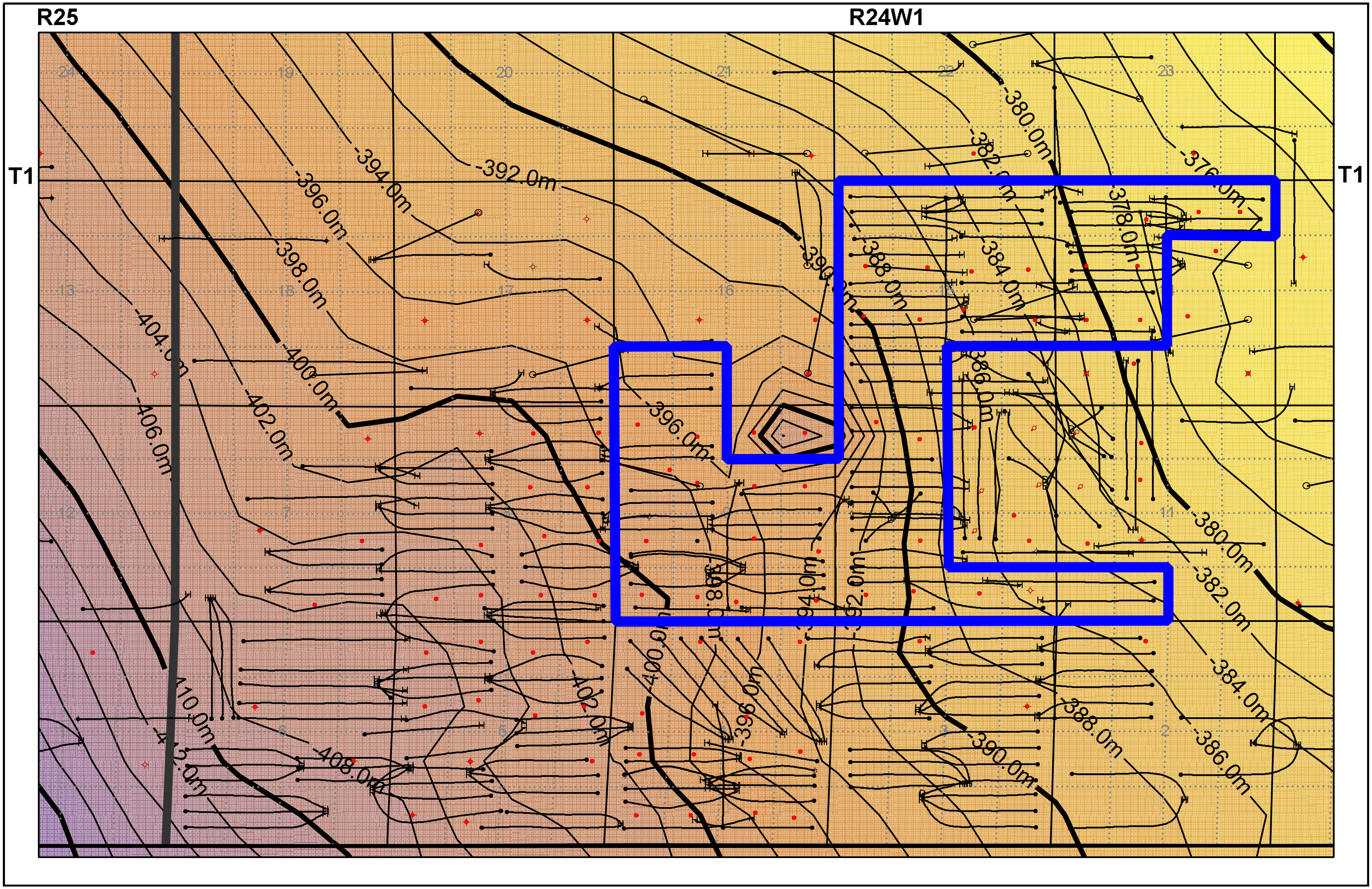
Appendix No. 1

Produced by :
AccuLogs
Version 8.2.1.178546
Datum: NAD27

Copyright 2015, IHS

Author: Neely
Modified On: Friday, June 03, 2016 04:47PM
Printed On: Friday, June 03, 2016 04:47PM
Start Formation: 5m. above AMRNTHL
End Formation: 5m. below Total Depth
Cross Section Name: WASKADAI4I4

Appendix No. 2



Goodlands Unit 3 Application
Green Sand Structure (Top of Reservoir)
June 07, 2016

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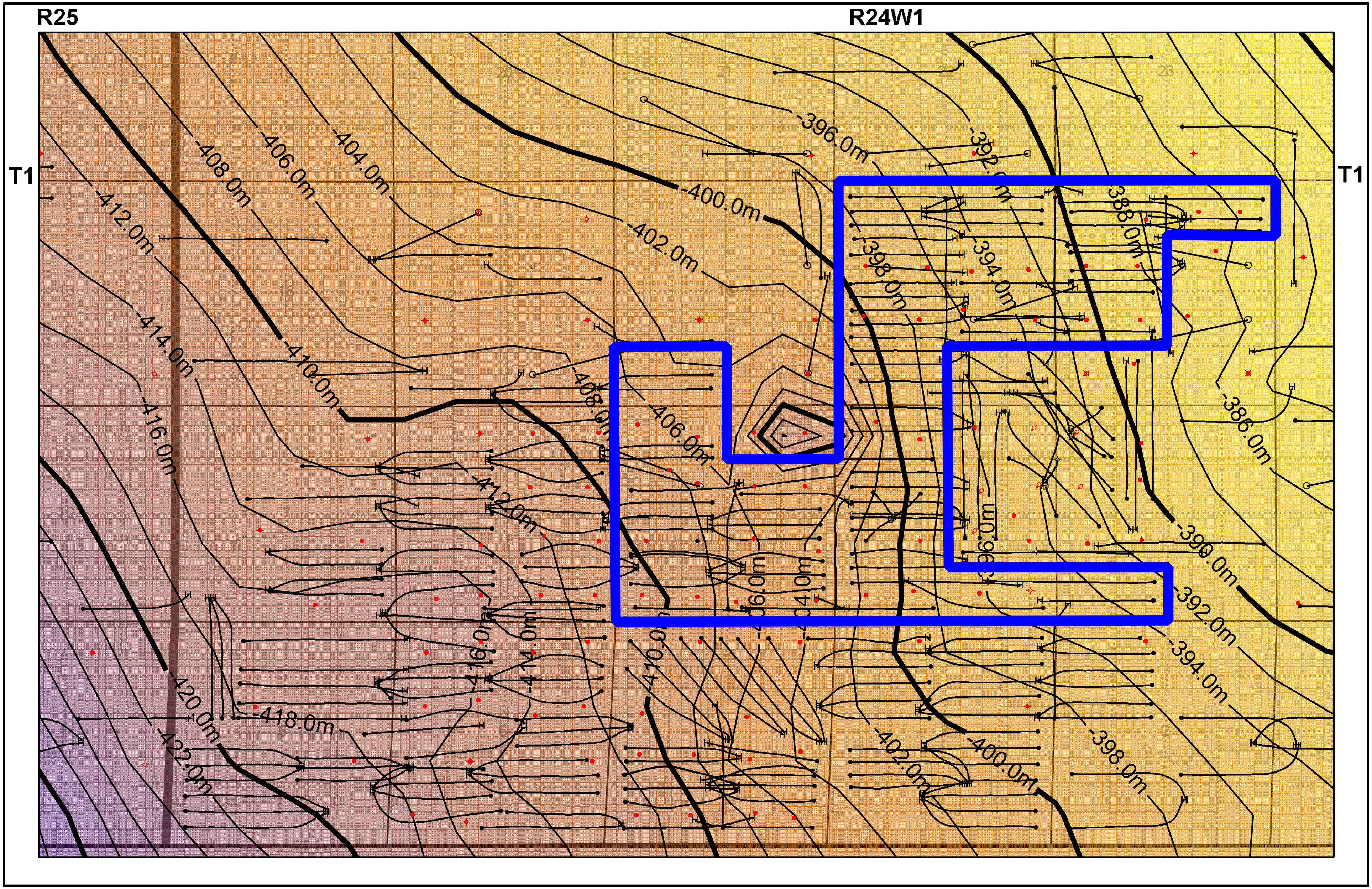
Appendix No. 3



Goodlands Unit 3 Application
Lower Sand Structure (Base of Reservoir)
June 07, 2016

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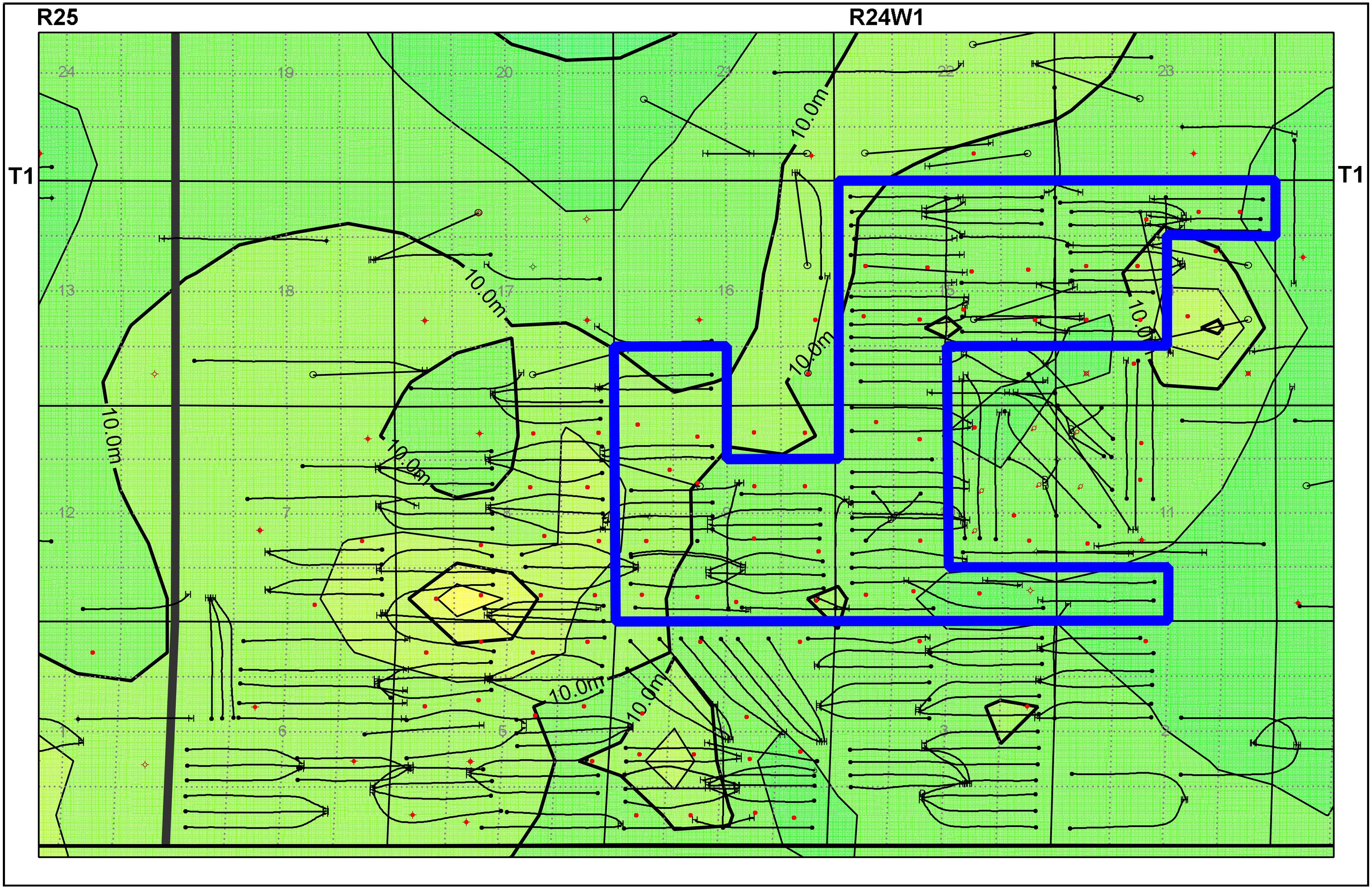
Appendix No. 4



Goodlands Unit 3 Application

Reservoir Isopach
(Green to Lower Sand Isopach)

June 07, 2016

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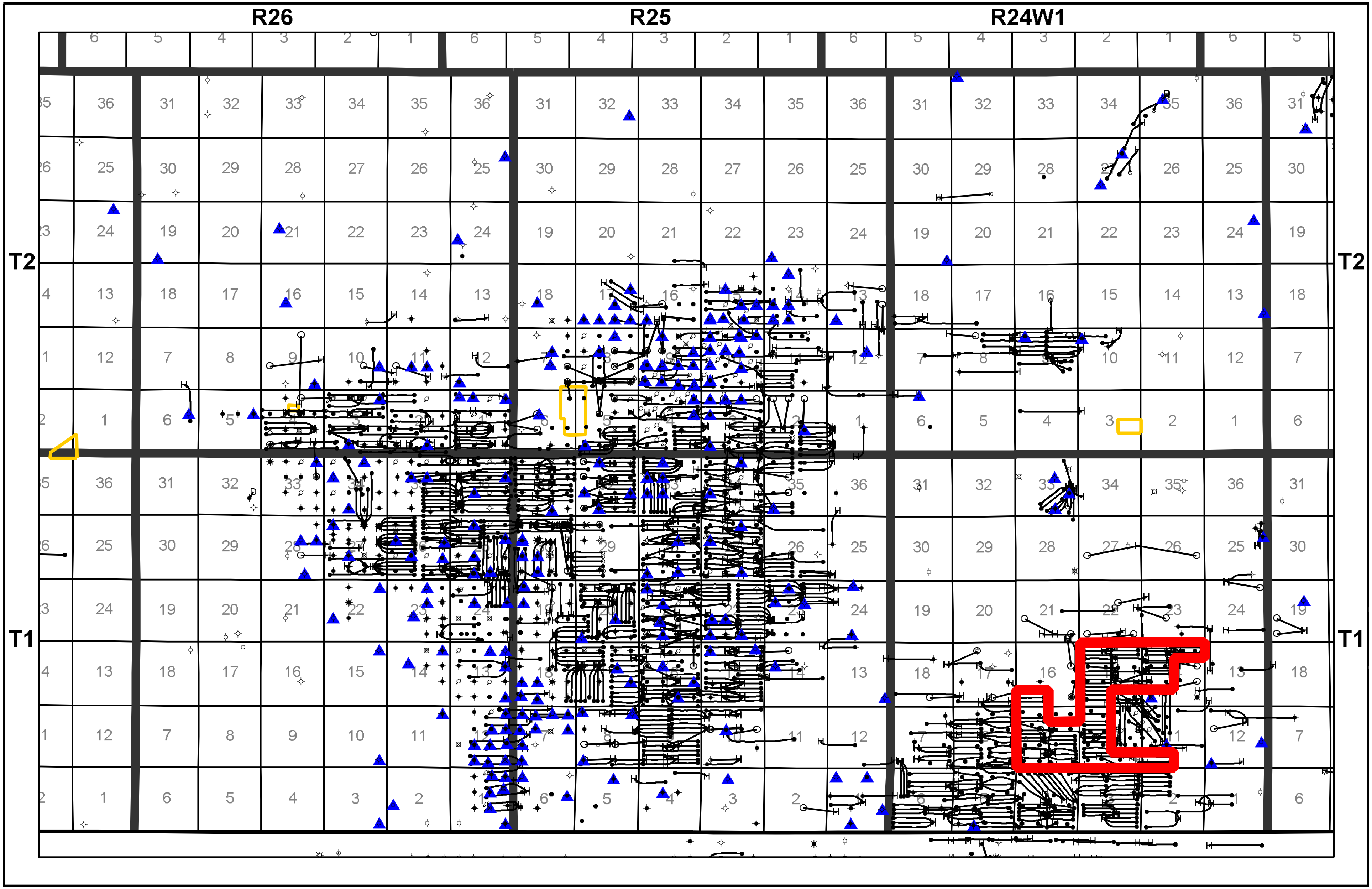

Goodlands Unit 3 Application

Wells with Core Analysis Used to Create Core Perm vs Core Porosity Cross Plot

June 07, 2016

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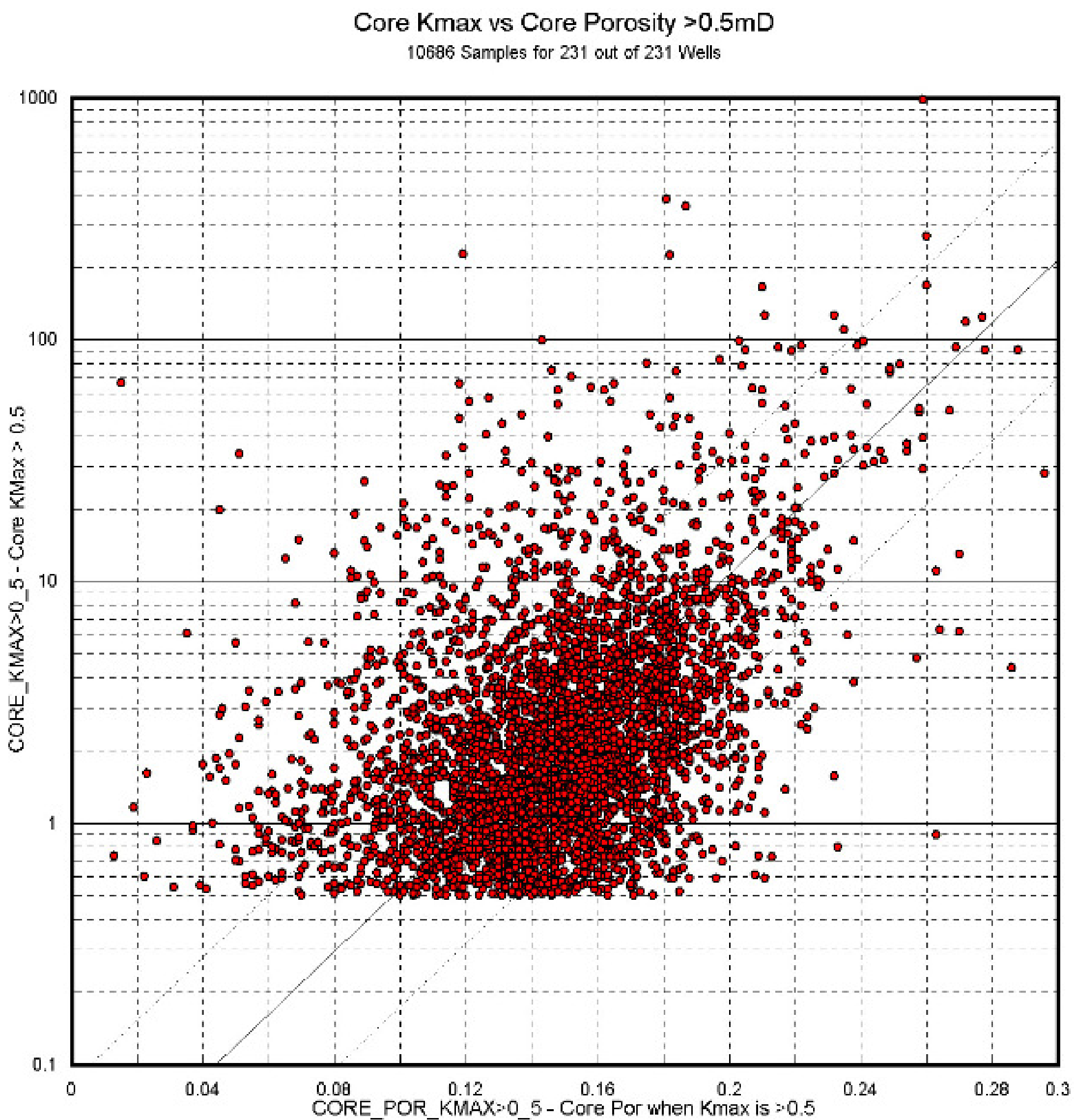
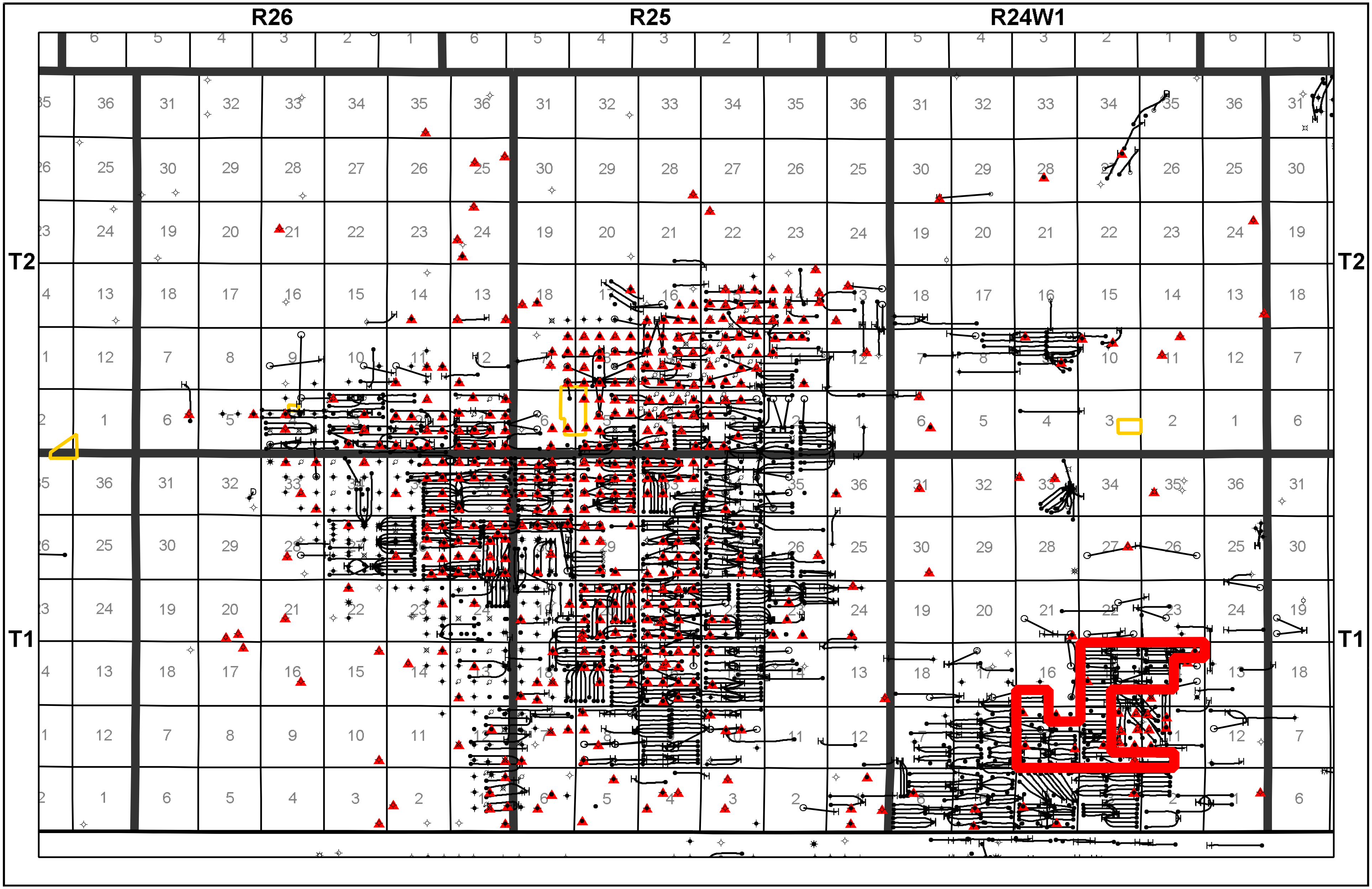
Tundra Pierson Waskada Project



LOG(CORE_KMAX>0_5) = 12.99873743*CORE_POR_KMAX>0_5 - 1.5681 Corr=0.422 StdErr=0.4908

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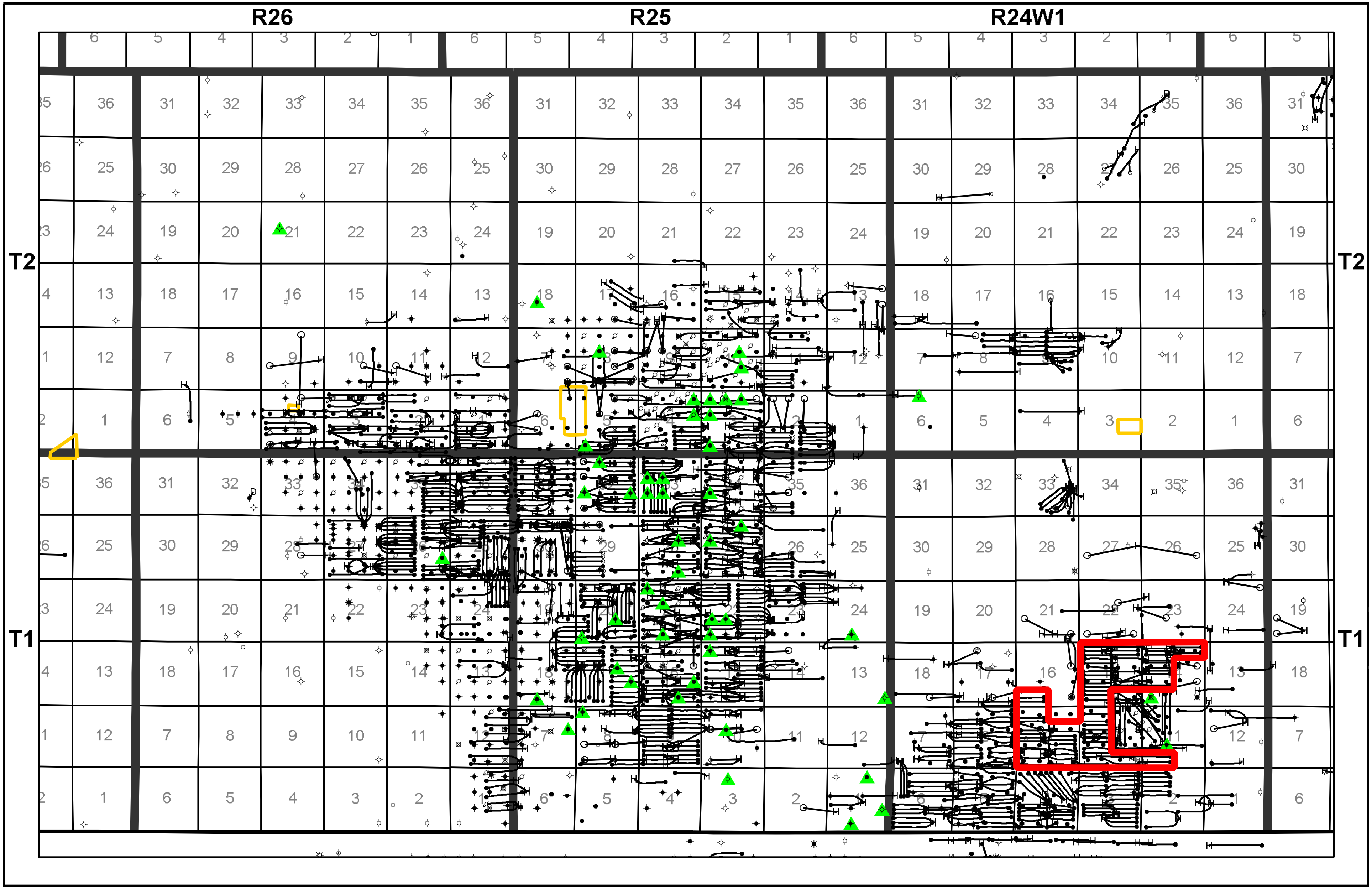
Goodlands Unit 3 Application
Wells with Digital Sonic Logs
June 07, 2016

Appendix No. 8



Goodlands Unit 3 Application

Wells with Digital Sonic Logs and Core Analysis over the Lower Amaranth Reservoir Interval

June 07, 2016

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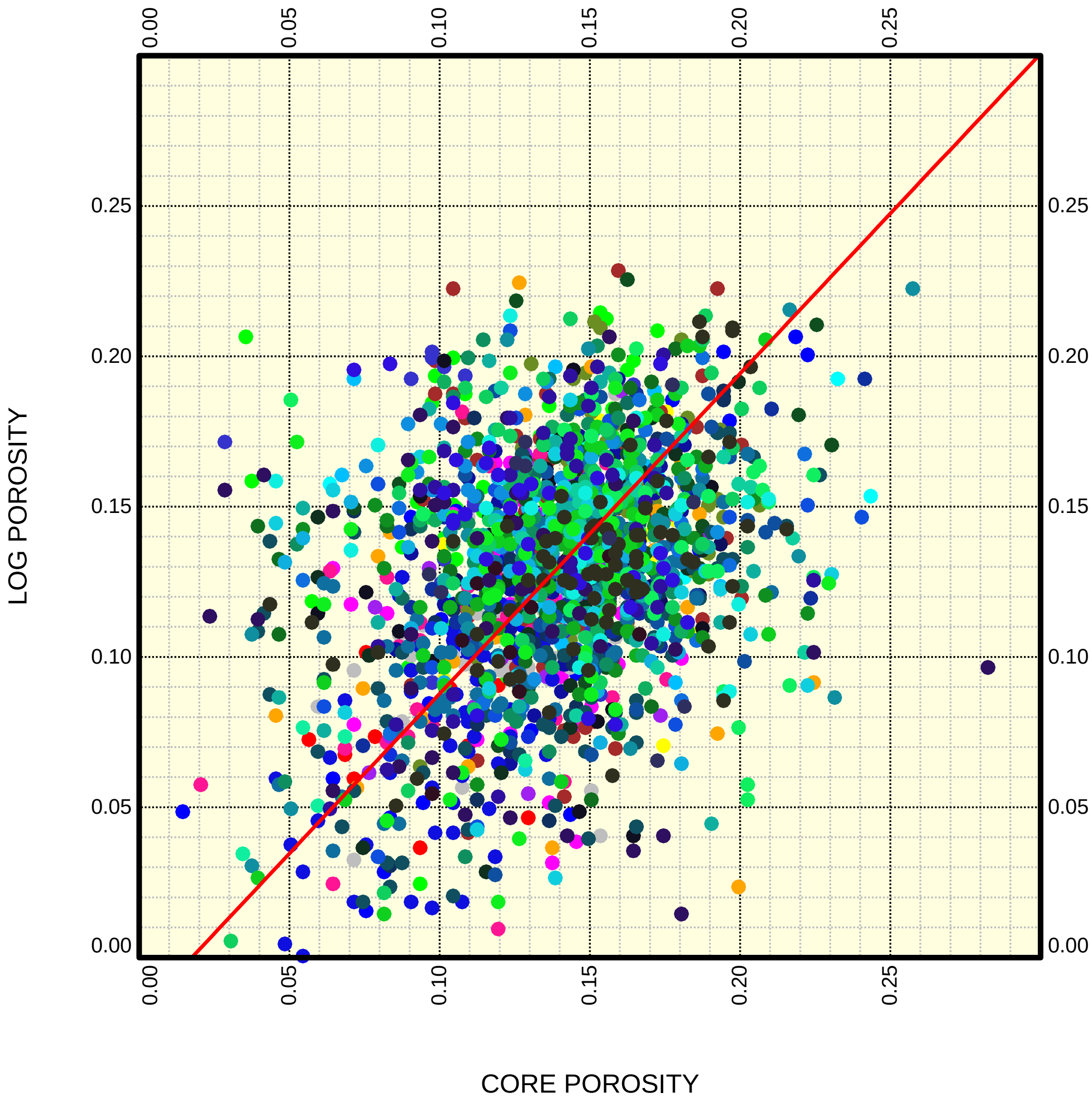
Appendix No. 9

Log Porosity vs Core Porosity Crossplot

Well: 52 Wells



Wells:

100011300125W100	100021600125W100	100022800125W100	100030100125W100	100031800125W100
100032100125W100	100032400125W100	100040300225W100	100040500225W100	100041400124W100
100042000125W100	100042200125W100	100052200125W100	100053200125W100	100053300125W100
100053400125W100	100061100124W100	100061800225W100	100062200125W100	100063300125W100
100071000225W100	100072000125W100	100080100225W100	100081600125W100	100081700125W100
100082600126W100	100083200125W100	100090400225W100	100090700125W100	100101000225W100
100101700125W100	100102800125W100	100110800225W100	100111000125W100	100112100125W100
100112100226W100	100113300125W100	100120300225W100	100122700125W100	100123300125W100
100130300225W100	100130800125W100	100131500125W100	100132100125W100	100140300125W100
100140300225W100	100140600224W100	100143200125W100	100150100125W100	100150300225W100
100152700125W100	100160400225W100			

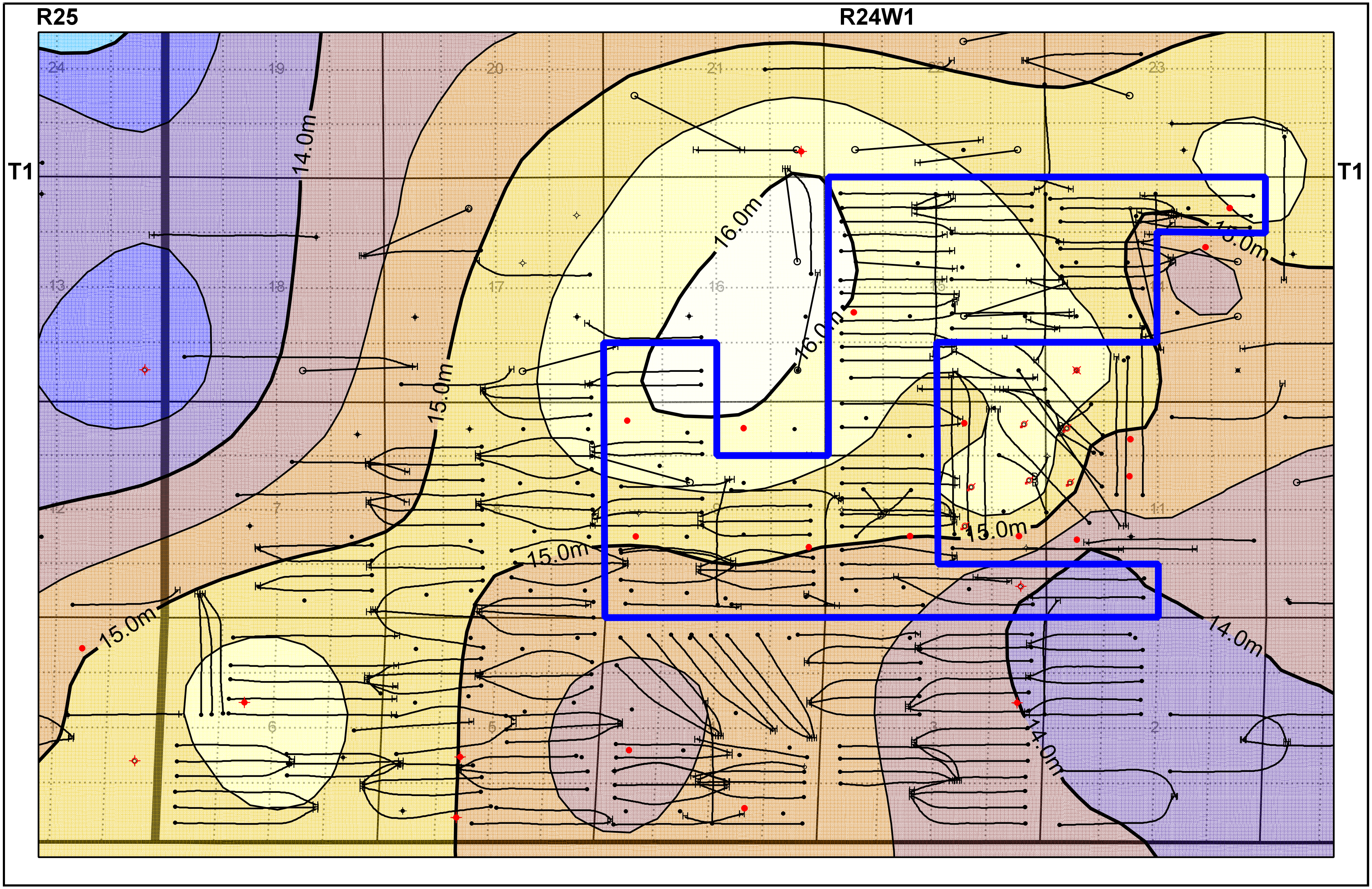
Intervals: U-GREEN_SAND U-BLUE_SAND U-PURPLE_SAND U-BROWN_SAND U-RED_SAND U-LWR_SAND

Functions:

test: Regression Logs: CORE.POROSITY, PHIE, CC: 0.329356

PHIE = (-0.0186548 + 1.06436*(POROSITY))

Appendix No. 10



Goodlands Unit 3 Application

Mean Sonic Porosity from Top Green to Base Red
Control Points in Red
Values in Percent

July 12, 2016

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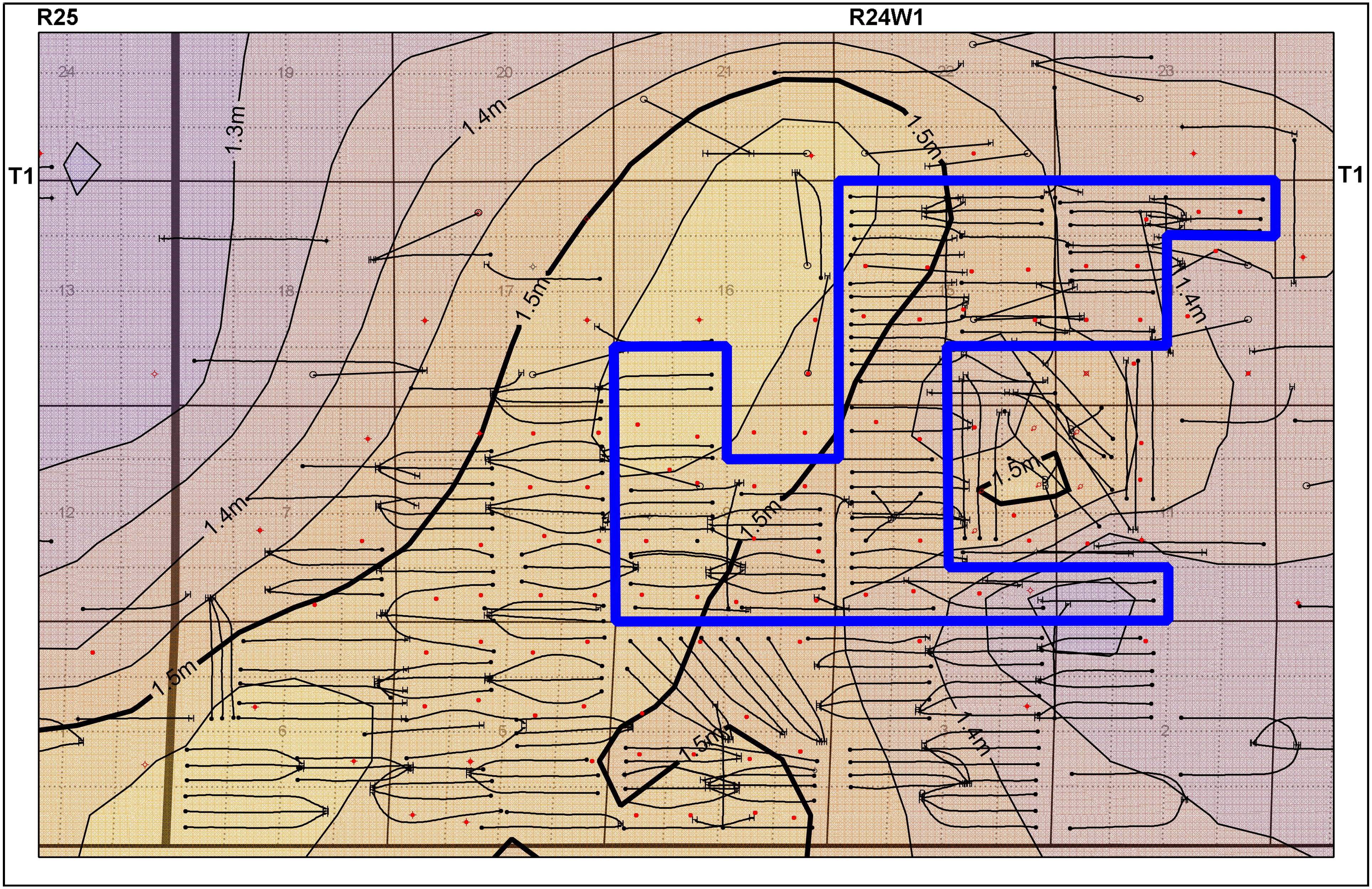

Goodlands Unit 3 Application
Phi_h at 10% cut off
June 07, 2016

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