Enhance Energy Inc. and North West Redwater Partnership

KNOWLEDGE SHARING REPORT

DIVISION A:
SUMMARY REPORT
Calendar Year 2017

Submitted on:
March 31, 2018

Green River, by Tom Milosz

ACTL

Alberta

Natural Resources Canada Ressources naturelles Canada
Canada

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

Disclaimer

While reasonable efforts were undertaken so that the information contained in this document was accurate at the time of printing, neither NWR nor Enhance assume any liability for errors or omissions. Changes and corrections to the information in this document may be incorporated in future versions hereof. Except as may be otherwise expressly agreed to in writing by NWR and/or Enhance, as the case may be, the information contained in this document is provided without any express, statutory, or implied representations, warranties or conditions, all of which are hereby disclaimed, and none of the authors, NWR, Enhance or their respective licensors will be liable for any damages or liability arising from or caused by any use or reliance upon this documentation. Neither NWR nor Enhance is responsible for any modifications, additions or deletions to the original version of this documentation provided by NWR and Enhance to the Province of Alberta, unless such modifications, additions, or deletions were performed by NWR and/or Enhance as the case may be.

ENHANCE
ENERGY INC.

CERTIFICATION ON BEHALF OF ENHANCE ENERGY INC.

CERTIFIED on behalf of Enhance Energy Inc. named in the "CCS Funding Agreement – The Alberta Carbon Trunk Line Project," to be true, accurate and complete, to the best of my knowledge, based on reasonable inquiry and due diligence, as of the date of this certification.

The Certification applies to the information supplied by Enhance Energy Inc. only and does not imply certification of information supplied by other Recipients.

Per: _____ Date: March 29/18

Blair Eddy, P. Eng.
Chief Operating Officer
Vice-President, Engineering & Operations

NWR
NORTH WEST REDWATER PARTNERSHIP

CERTIFICATION ON BEHALF OF NORTH WEST REDWATER PARTNERSHIP

CERTIFIED on behalf of the North West Redwater Partnership named in the "CCS Funding Agreement – The Alberta Carbon Trunk Line Project," to be true, accurate and complete, to the best of my knowledge, based on reasonable inquiry and due diligence, as of the date of this certification.

The Certification applies to the information supplied by the North West Redwater Partnership only and does not imply certification of information supplied by other Recipients.

Per: _____ **Date:** March 27, 2018

Kerry Margetts
President

Part A – Executive Summary

Enhance Energy Inc. (“Enhance”) and North West Redwater Partnership (“NWR”) are developing a fully integrated Carbon Capture and Storage (“CCS”) project, the Alberta Carbon Trunk Line (“ACTL”), incorporating:

- CO_2 capture from the existing Agrium Redwater fertilizer plant;
- CO_2 capture from the NWR Sturgeon Refinery project under development using gasification and Rectisol® synthesis gas purification and conditioning technology;
- A 240 km CO_2 transportation trunk line; and
- Storage, including Enhanced Oil Recovery (“EOR”).

The ACTL project will provide critical CO_2 gathering and distribution infrastructure to enable the cost-effective management of CO_2 emissions. The project also represents an opportunity to showcase how the Province’s vast bitumen resources can provide competitive and environmentally sustainable energy amid tightening environmental standards.

This Summary Report will highlight the information contained in the attached Division B Detailed Report. The status and progress of each component (see Figure 1 below) of the ACTL will be summarized, as well as the relevant financial information.

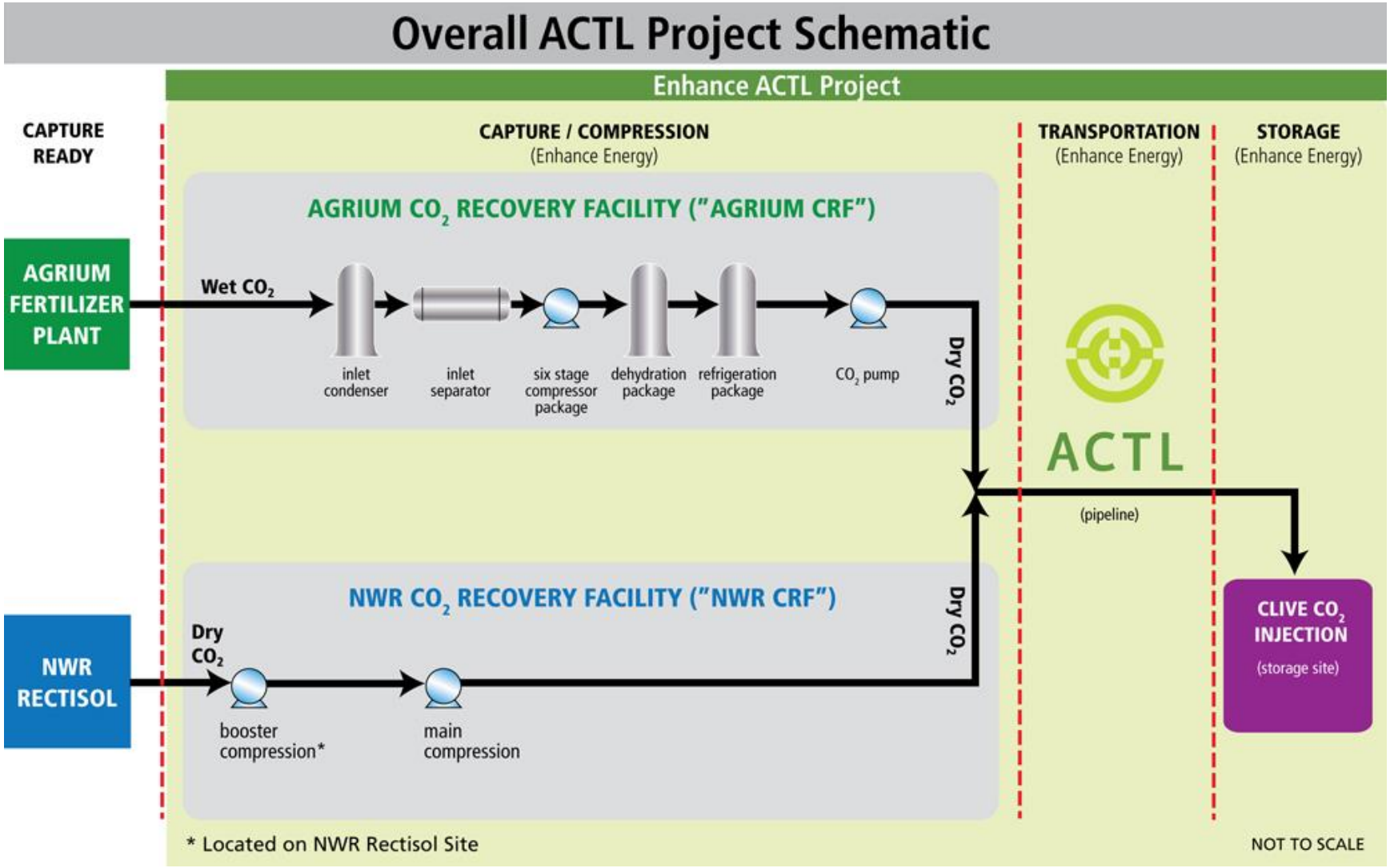


Figure 1 - Overall ACTL Project Schematic

Substantial progress has been made on the ACTL project, particularly the NWR portion. The ACTL is forecast to start-up with Agrium volumes in late2018, and NWR CO_2 volumes coming on-stream thereafter. An updated timeline as of December 31, 2017 is shown in Section 11: "Project Timeline".

Key activities achieved during the 2017 year include:

Agrium CO_2 Recovery Facility:

- Continued to monitor and update construction and material costs with contractors and suppliers

NWR Rectisol® Unit:

- All modules have been received on site and installed.
- All vessels are now standing.
- All piperacks have been installed.
- Gasifier Unit Construction at end of 2017 was 96% complete.
- Rectisol® Unit specific construction at end of 2017 was 95% complete.

NWR CO_2 Booster Compression Unit:

- Compressor motor has been installed on foundation and building and piping construction is underway.
- Compressor has been installed on the foundation.
- Electrical unit is complete.
- Tank farm and piperack unit are complete (CO_2 booster discharge line to CO_2 Main Compression Unit).

CO_2 Main Compression Unit:

- Continued compression supplier evaluation in view of delivery and price changes as a result of schedule changes
- Continued to monitor price and delivery of other major components.

Transportation:

- Continued design review for optimal construction with construction contractors.
- Cost estimating of ACTL pipeline has been refined.
- Extensions to regulatory permits were obtained.
- Continued updates were shared with stakeholders through one-on-one meetings and newsletters.

Storage:

- Enhance has completed a geo-model and history matched reservoir simulation of the initial CO_2 EOR area that will be used for both EOR/storage optimization and as part of MMV activities.
- Reservoir simulation model has been used to determine CO_2 injectivity and movement within the Clive reservoir.
- Enhance completed a MMV plan and submitted it to Alberta Energy in 2016. Based on new information and feedback from the regulators, Enhance began updating the plan in 2017 and expects to submit it in early 2018.
- The AER Directive 065 application for the initial CO_2 EOR development was submitted in December 2017.
- CO_2 injection well locations have been acquired, and associated D56 consultation process completed.
- Proposals received for recycle compressors and CO_2 injection and gathering pipelines.

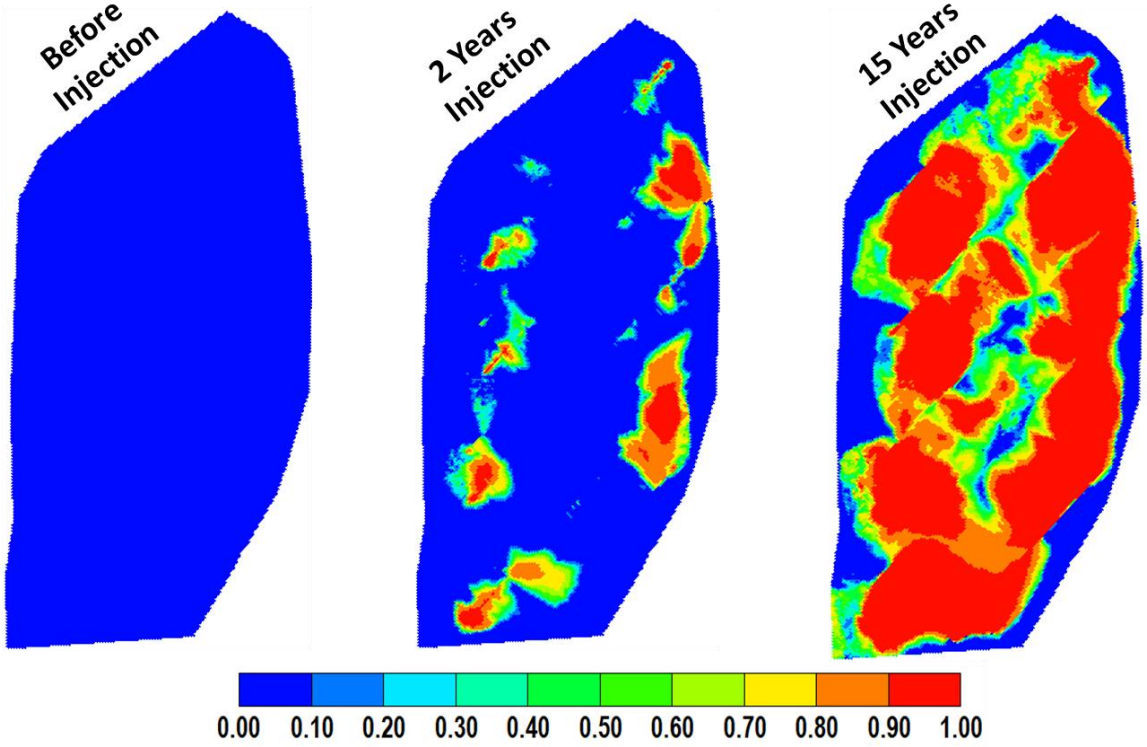


Figure 2 - Example of CO_2 saturation from reservoir simulation during active EOR phase

Part B – Project Status Overview and Commentary

NWR

2017 was a key year for construction at the Sturgeon Refinery as manpower peaked at over 8000+ for the overall project bringing the the project progress to 99% complete, and construction progress to 99% complete. A portion of the refinery was commissioned in Q3 and first diesel production was achieved in December. The NWR portion of the CCS project (the Rectisol® Unit) is now almost complete Rectisol 95% complete at the end of 2017. Although the Rectisol® Unit is almost complete, the unit will still require substantial work to commision throughout the first half of 2018.

Enhance Energy Inc.

Project financing continued to be the key focus for 2017. Enhance was successful in obtaining financial commitments in calendar Q1 2017 for the required project funding. Since that time drafting of formal legal documents has been ongoing. Formalizing these financing arrangements has been a complex and time consuming effort due to the number of stakeholders and the diversity of their financial and commercial interests.

During this extended period of discussions, significant effort has been spent with vendors and contractors to determine the shortest execution timeline to allow for first CO_2 injection by the end of 2018. If final consent and financial close is delayed past the end of Q1 2018, delays to first injection are likely.

Enhance continues to refine the ACTL engineering and construction plans to minimize construction timelines and costs. Detailed interaction with the pipeline contractors at the engineering level has resulted in a well-defined scope of work. Several construction recommendations from the contractors have been incorporated into the pipeline design, enabling better construction practises. The CO_2 compression facilities and ACTL pipeline are ready to execute upon completion of financing.

Significant progress was made in the Clive storage reservoir geological modelling and simulation in 2016. The refined geological model incorporated over 187 wells, 2800 m of logs, and 3700 core samples into the PETREL software platform. The reservoir simulation model was refined to allow for 36 times more grid blocks that allowed for an excellent history match of the model to actual reservoir performance.

The refined model allowed for the analysis to determine the optimal CO_2 injection and to ensure the CO_2 moved efficiently through the reservoir. Several dozen development scenarios were conducted in 2017, with variations on injection rate and volumes during the injection cycles, resulting in the completion of the Clive development plan. The plan will be phased development of Clive Leduc over several years. The injection wells will be horizontal with

lengths of 1400-1600 m long, with 2 wells drilled from one surface pad site. Additional work was also done on the long term fate of CO_2 storage in support of the Measurement, Monitoring & Verification ("MMV") plan. Figure 3 below shows a time series of predicted CO_2 saturation on a vertical slice (cross section) end-on showing a series of injectors and producers. The colour bar going from blue to red represents increasing CO_2 saturation in the model. The images represent the initial state, after two years of injection, at the end of injection (25 years) and 500 years to show long term CO_2 fate. The decrease in CO_2 saturation from 25 years to 500 years is due to continued dissolution of CO_2 into the residual oil and water phases in the model. The version of GEM used by Enhance for this study does not account for mineralization or ionic trapping of CO_2 but these phenomena were investigated by AITF and found to trap about 9% of CO_2 in rock containing only CO_2 and residual water.

Structural trapping of the CO_2 is also evident (CO_2 is staying in the upper half of the model due to buoyancy effects where it will be contained by the Ireton cap rock) providing added confidence that CO_2 will stay within the Phase 1 area.

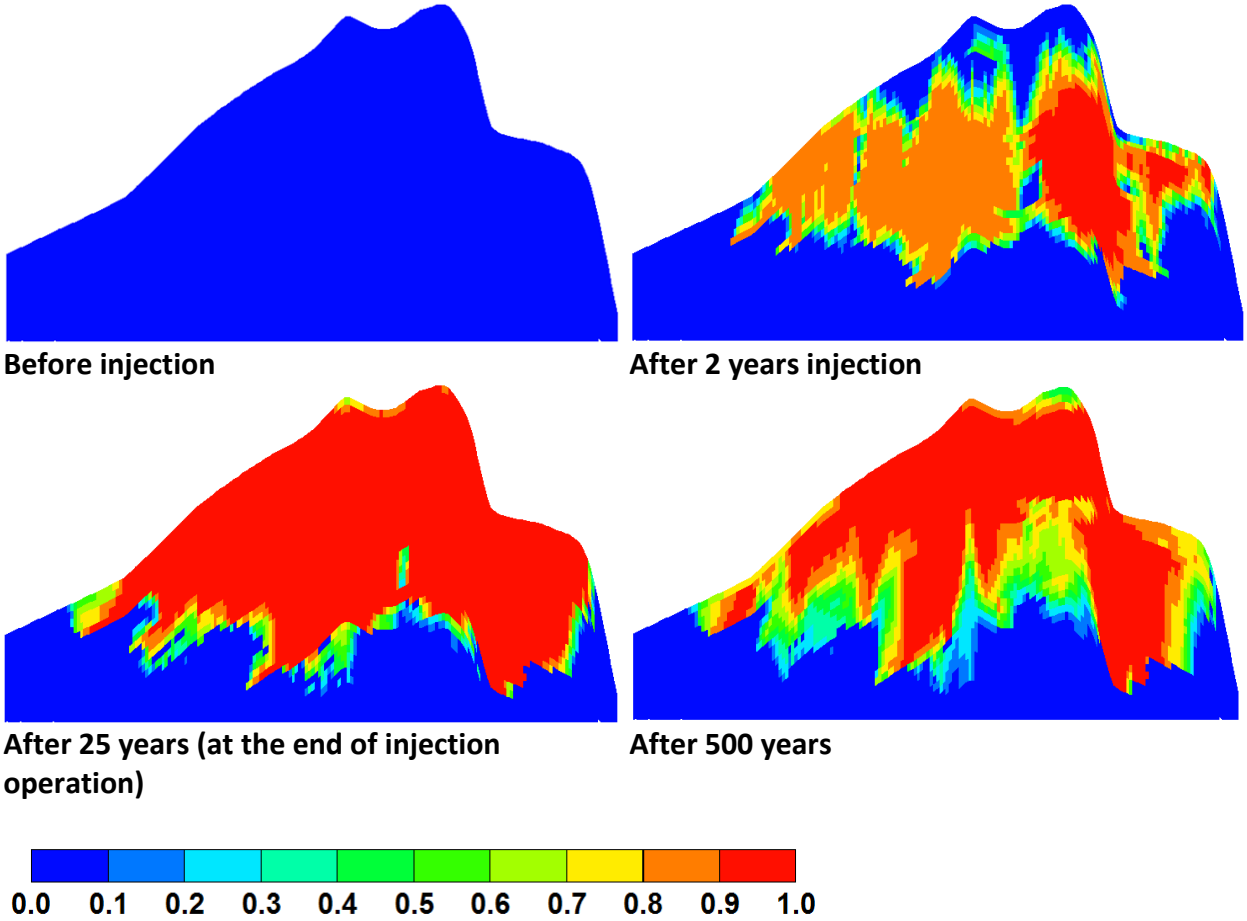


Figure 3: Cross Sections of Predicted CO_2 Saturation vs. Time Beyond Active EOR Phase (i.e. Storage Phase)

The completion of the Clive development plan allowed for the MMV plan to be further developed in 2016. The plan builds on the previous work by Alberta Innovates Technology Futures (AITF) to focus on the assessment of wellbores penetrating the reservoir. The existing and new wellbores will be key monitoring areas, with the biosphere (soil gas) and hydrosphere (water well) testing to be conducted in proximity. The EOR production will also allow for effective monitoring of CO_2 movement as this data can be incorporated into future reservoir simulation. The plan was submitted to Alberta Energy in 2016. Based on regulatory feedback and new information, Enhance worked on updating the plan in 2017 and expects to submit an updated version in early 2018.

The ACTL project will employ technologies that are commercially mature. The primary innovation of the project is its scope and integration of various existing technologies to demonstrate an economic carbon solution for Alberta.

Section 1: Facility Design

A) AGRIUM CO_2 Recovery Facility ("Agrium CRF")

Design of the CRF Facility (to date)

The design basis for the new Agrium Capture Facility is for economic recovery of CO_2 from the fertilizer plant's CO_2 emission streams. The streams pass through inlet cooling, separation, compression, dehydration, and refrigeration. This process produces liquefied CO_2 that is then pumped into the ACTL pipeline at a pressure of 17,926 kPag [2,600 psig], which transports the CO_2 to EOR fields at the end of the line for permanent storage.

The facility was designed to recover the highest percentage of CO_2 from the incoming feed stream. Various process options were discussed before arriving at the proposed process design. This current design utilizes a "fit for purpose" philosophy by incorporating typical oilfield/industrial technology, sourced and serviced locally.

Plot Plan and Facility Location

The plot plan (shown below) illustrates the layout of the CRF, which is located just outside the boundaries of Agrium's fertilizer plant in Alberta's Industrial Heartland.

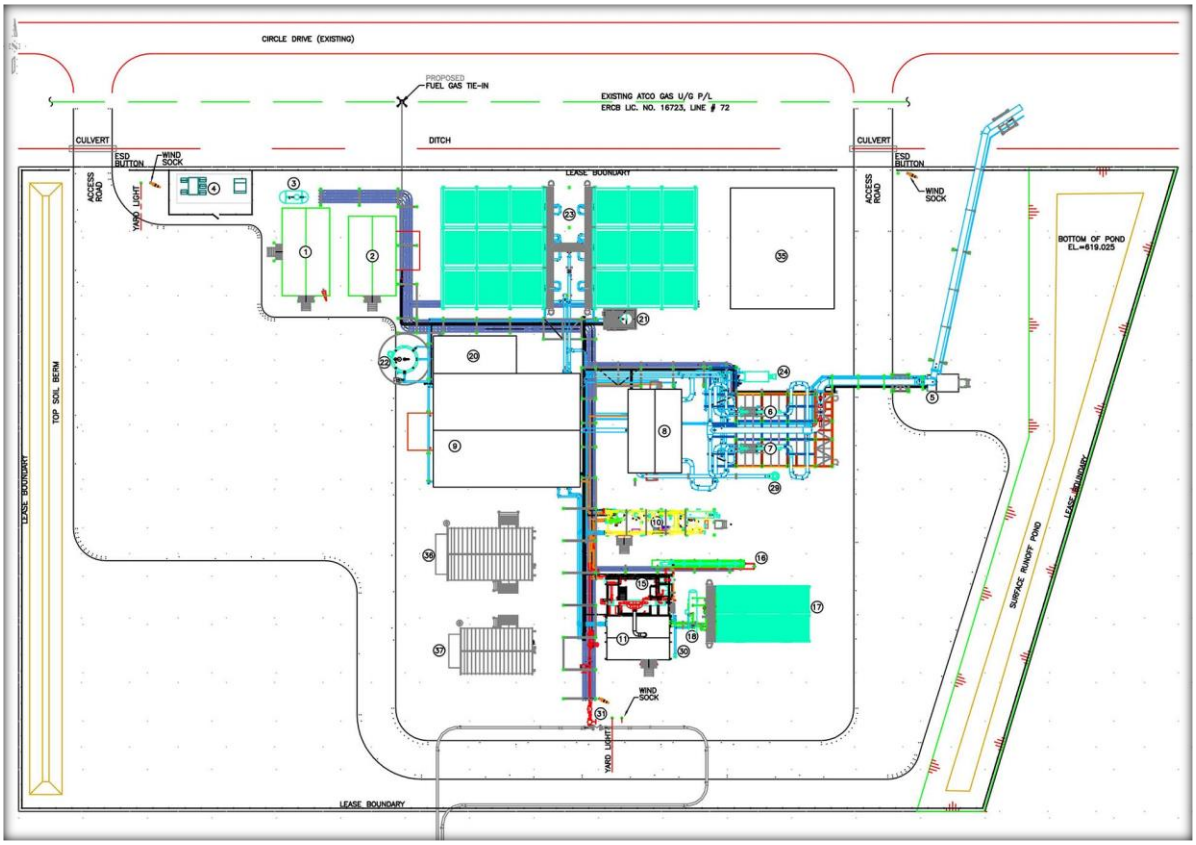


Figure 4 - Agrium CRF Plot Plan

-

** A higher resolution plot plan with more detail is available in Appendix vi of the Detailed Knowledge Sharing Report*

Separation Process Type and Description

As the CO_2 Enhance receives from Agrium is wet, a separation process is needed at the Agrium CRF before the CO_2 can be put into the pipeline. Accordingly, the cooled two-phase stream flows into a carbon steel inlet separator that separates the condensed water from the wet CO_2 gas stream. One electric driven produced water pump maintains the level in the inlet separator and pumps the condensed water to a waste drain at the Agrium site. Produced water disposal volumes will be metered. The produced water will be disposed through the Agrium facility into their existing deep disposal well system.

B) NWR Rectisol®

The NWR CO_2 capture system is heavily integrated into the design of the refinery's Gasification hydrogen supply Unit. The Gasifier Unit uses the unconverted petroleum bottoms (asphaltene) generated in upgrading as a feedstock to produce synthesis gas (syngas). The technology selected to condition the syngas is the Rectisol® acid gas removal process licensed from Lurgi, a

German engineering and construction firm. When operational, the Rectisol® Unit will produce over 3,600 tonnes per day of pure CO_2. Rectisol® is a physical absorption process carried out at low temperatures and high pressures using cold methanol as an absorption medium. The Rectisol® process is a mature technology that has been used for decades in the coal gasification, fertilizer and refinery industries. Increased demand for products derived from synthesis gas since 2000 has led to resurgence in Rectisol® installations around the world.

The NWR Sturgeon Refinery is built in the industrial heartland of Sturgeon County, approximately 45 km north-east of Edmonton. The plot plans shown below indicate the location of the Gasifier Unit and Rectisol® Unit within the refinery.

C) NWR CO_2 Recovery Facility ("NWR CRF")

The NWR CRF consists of a three stage CO_2 booster compressor unit to be located at the north-east corner of the Gasifier Unit and a five stage main compressor unit which will be located on the perimeter of the refinery. The booster compressor raises the NWR CO_2 from close to atmospheric pressure to approximately 1,400 kPag (203 psig) while the main compressor further increases the pressure of the CO_2 to 18,000 kPag (2600 psig) necessary for pipeline transportation.

NWR Sturgeon Refinery Plot Plan

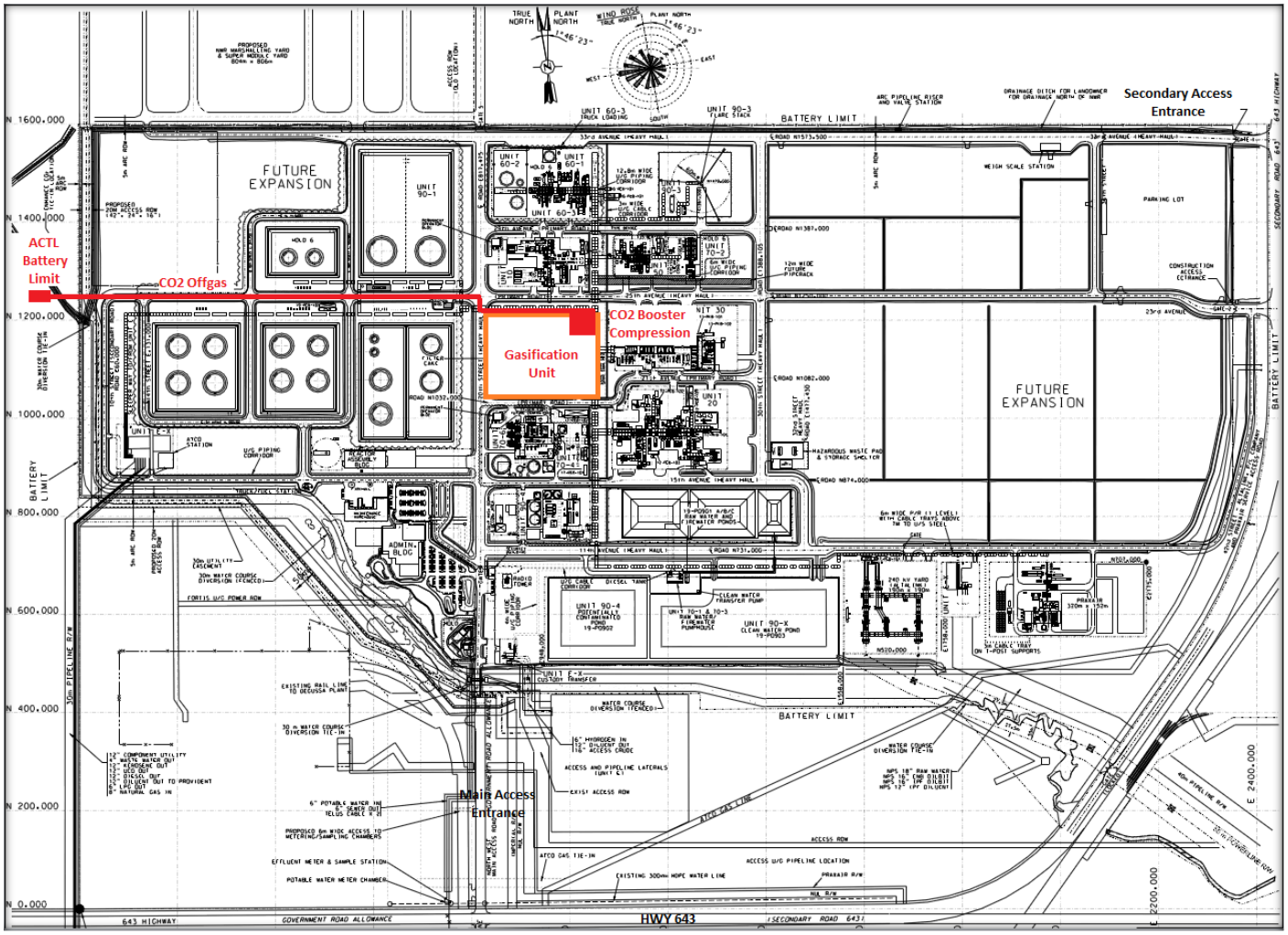


Figure 5 - NWR Sturgeon Refinery Plot Plan

Gasifier Unit Plot Plan

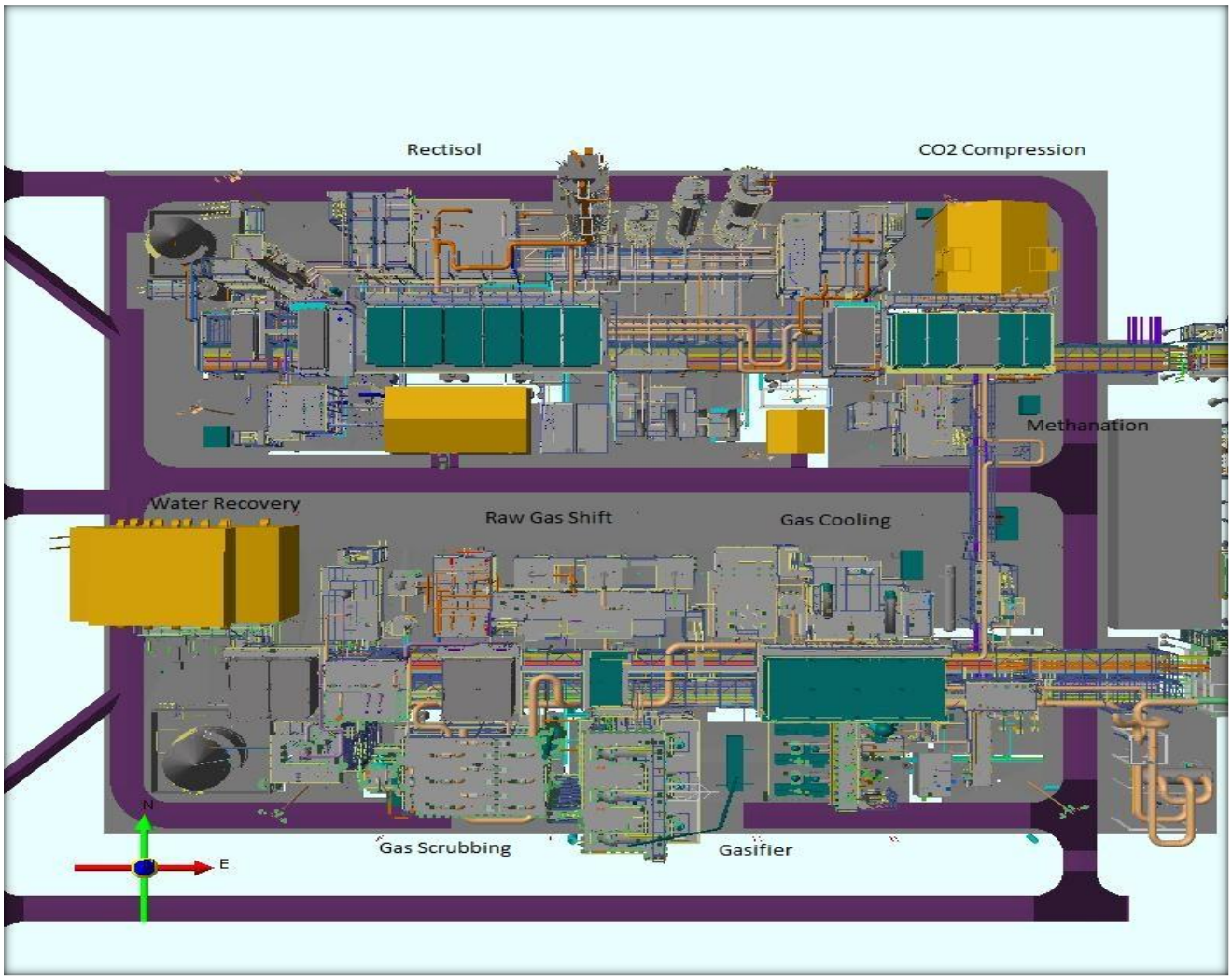


Figure 6 - Gasifier Unit Plot Plan

-

Rectisol® 3D View Looking South

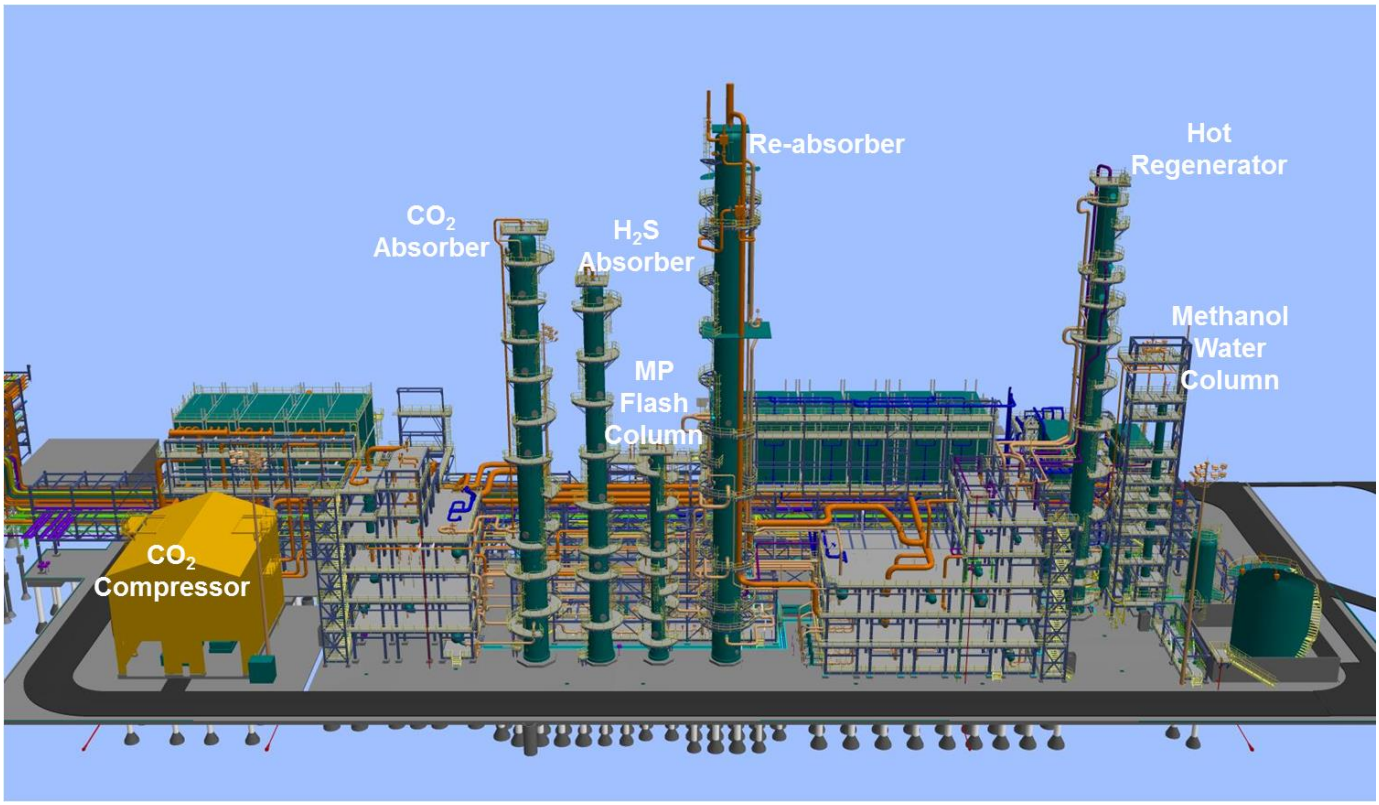


Figure 7 - Rectisol 3D® View Looking South

D) Pipeline Facility

The ACTL pipeline will be 240 kilometers in length, and will begin in Alberta's Industrial Heartland, by the Agrium and NWR CRFs, and go south ending at the Clive storage field (shown in Figure 8). The detailed alignment sheets for the pipeline are 99% complete as are the construction plans and Horizontal Directional Drill ("HDD") crossing designs. 100% of the Right of Way ("ROW") has been acquired from landowners. Procurement of materials is underway. Pipe specifications have been finalized and pipeline valves and actuators have been delivered.

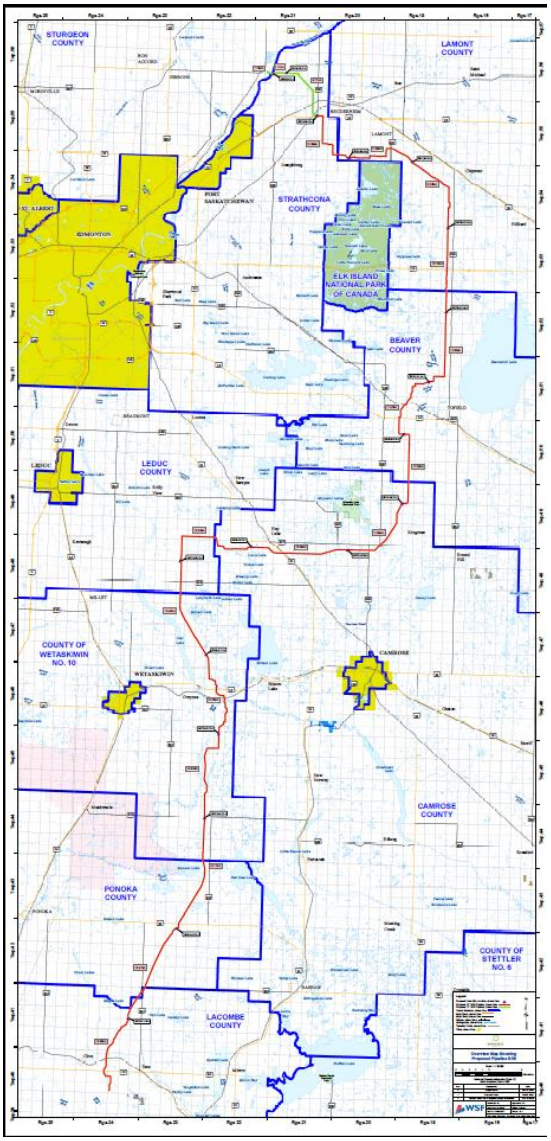


Figure 8 - - ACTL Route Map

The main activities in 2017 consisted of ongoing monitoring of pipe and coating supply and delivery costs and shcedules, continued discussion with contractors and suppliers and continued stakeholder consultations.

E) Injection Facility

The injection facility will be located at the end of the ACTL pipeline at the Clive storage site (shown in Figure 8).The first phase of injection well locations have been acquired. The public consultation process (D56) was completed in March after conducting an open house in the town of Clive. The event was advertised in local newspapers and newsletters and their websites and a local radio station. Enhance also mailed out 336 personal invitations. Approximately 45 stakeholders attended the open house, where Enhance staff were on hand to provide information and answer questions about the project. Additionally, Enhance provided informational hand-outs including the following Alberta Energy Regulator ("AER") material:

- Letter from the CEO of the AER
- the AER Brochure: Understanding Oil and Gas Development in Alberta
- the AER Publication EnerFAQ No. 7: Proposed Oil and Gas Development: A landowners guide
- the AER publication EnerFAQs No. 11: Expressing Your Concerns – How to File a Statement of Concern About an Energy Resource Project

All attendees provided positive feedback and support for the project.

Section 2: Facility Construction

A) Agrium CO_2 Recovery Facility ("Agrium CRF")

Enhance completed the tie-ins on the existing Agrium plant 9 in June of 2011, during a scheduled shutdown of the plant for maintenance. This timing was strategically planned to minimize any inconvenience to Agrium. The Plant 1 tie-in was completed in 2015. Enhance continued to monitor construction and materials costs to complete the project in 2017.

B) NWR Rectisol®

Construction of the Gasifier Unit, including Rectisol®, started in August 2014, and is currently ongoing. Construction of the Gasifier Unit is 96% complete overall, with the Rectisol Unit at 95% complete. All major equipment has been placed on foundations and all modules are on site and installed. Construction of the Rectisol Unit is expected to be mechanically complete by calendar Q2 2018.

CO_2 Commercial Operations is forecast to begin in calendar Q3 2018, however the Gasifier Unit construction schedule and in-service date are interdependent on the overall refinery project development and other processes proceeding in parallel as well as completion of the ACTL.

C) NWR CO_2 Recovery Facility ("NWR CRF")

Construction and operation of the Enhance CO_2 Booster Compressor is tied to the construction of the NWR Rectisol® Unit, as it is located within the Gasifier Unit boundary limits. Construction and operation of the Enhance Main Compressor is also tied to the construction of the Rectisol® Unit. Enhance staff are working with several vendors to optimize, cost, delivery and reliability for the Main Compressor. Construction of the NWR Booster Compressor building and piping is complete and utilities have been commissioned. The Booster Compressor and Motor are installed on their foundations and associated Tank Farm and Piperack Units and Electrical Unit are complete.

D) Pipeline Facility

Major equipment with long lead times, such as valves and actuators, have been purchased and delivered. Initial construction scoping along the pipeline route began in the first calendar quarter of 2013, including the scoping of the major horizontal directional crossing and initial clearing and timber removal of portions of the line. The main construction for the ACTL is expected to commence in Q3 2018 with ordering of line pipe and awarding of construction contracts in mid 2018.

E) Injection Facility

Well locations have been finalised and facility design is underway. The construction of the injection facility is expected to commence in late2018.acquisition. Landowner acceptance and approvals of pipeline, lease and facility dispositions has proceeded without issues due to Enhance's extensive consultation and communication efforts.

Section 3: Geological Formation Selection

Storage for Enhance's ACTL project will take place at the depleted hydrocarbon reservoir at Clive.

Summary of reasons for selecting the final site

Practical suitability

There are many practical reasons which make Clive a suitable storage site for CO_2. The Clive reservoirs are mature waterflooded oil reservoirs. In this context, they provide:

- Containment for CO_2 due to the fact that they have contained hydrocarbons for millions of years;
- Capacity for CO_2 storage due to significant production of oil and gas providing voidage;
- Injectivity for CO_2 due to substantial water injection operations for five decades; and
- Residual oil production to provide for economic support of large scale CO_2 sequestration.

The Clive reservoirs are also unitized, enabling common ownership and royalty interests across the reservoirs. This provides the opportunity to take advantage of the unique geology, with minimal complications due to competitive ownership interests, in order to maximize oil recovery and maximize sequestration of CO_2.

Geographical suitability
The storage site was also attractive due to its geographic location. As Clive is not adjacent to large residential developments, it makes it easier for surface access to design, build and operate a CCS EOR project with minimal disruptions to residents.

Potential EOR benefits
The potential EOR benefits of CO_2 sequestration sites are important criteria for consideration in the site selection process. This is due to the fact that the economic gains associated with EOR, and specifically the sale of incremental oil production, will financially support the cost of an expensive CCS scheme.

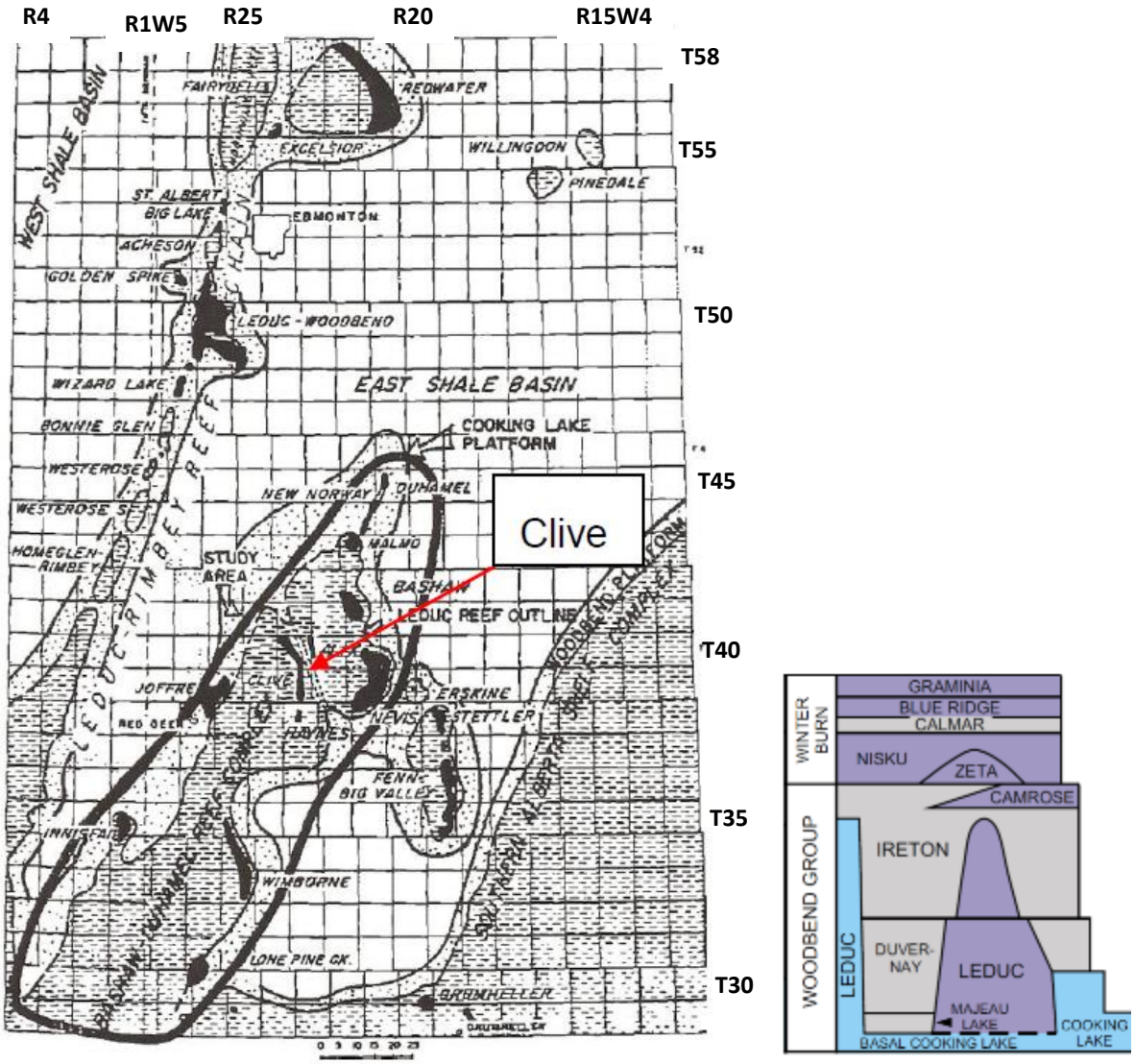
The EOR benefits extend beyond Enhance. Albertans benefits from this project through increased royalties to the Province and job creation. It is estimated that at full capacity the ACTL project will create $15 billion in royalty revenue for the Alberta government over the next 30 years.

Additional social benefits are created through revitalization of economic activity in an oil and gas field that is near abandonment. Job creation for the initial ACTL project is estimated at 2,000 direct jobs during peak construction and an additional 8,000 indirect jobs over the life of the project. To date, it is estimated that approximately 230,000 man-hours have been expended by suppliers, contractors and internal efforts. Ongoing job creation as the ACTL system expands is forecast to run in the tens of thousands.

Key characteristics of the geological formation

Location of injection reservoir: CO_2 will be injected into Clive, as shown in Figure 8.

Figure 9 - Relative Location of CLive Reservoirs and its Stratigraphy



Source: *Tsang, G. and Springer, S.J, —Innisfail-Clive-Nevis Reef Chain Revisited‖, CIM Paper 83-34-24, presented at the 34 ATM of the Petroleum Society, May 10-13, 1983, Banff.*

Depth and thickness of the reservoir

Comprehensive maps showing an interpretation of the storage formation's porosity tops, which also illustrate sub-sea depth and thickness at the reservoir, are found in section 3.4 of the detailed report.

This relates to a depth from surface of 1,775-1,915 m (mean: 1,831 m), with an average thickness of 6.4 m for the Nisku reservoir, and a depth from surface of 1,845–1,938 m (mean: 1,874m), with an average thickness of 8.75 m for the Leduc reservoir.

Injectivity of reservoir

Injectivity of CO_2 is derived from historical performance of water injection. The Clive reservoirs have shown tremendous capacity for water injectivity. Typical determination of injectivity is based on equivalent volumes at the same reservoir pressure and reservoir temperature.

Water injection wells for the Clive reservoirs have not seen any rate limitations as they have been able to take water on vacuum. Thus, CO_2 injectivity at any Clive reservoir is not expected to be constrained by reservoir parameters but may be impacted by wellbore configuration or surface facility design. Enhance is planning to use horizontal injection wells for the project which will be capable of handling injection volumes. See Section 3.14 of the Detailed Knowledge Sharing Report.

Porosity and permeability of the reservoir

Enhance contracted a study of the Clive reservoirs (Nisku and Leduc) in 2008 and in part, an examination was undertaken to determine the porosity, permeability and its interdependence for the Nisku and Leduc reservoirs. During 2016, Enhance used this information and additional analyses to construct a sophisticated geo-model of the storage complex. See Figures 10 and 11 for examples of graphical output from the geo-model.

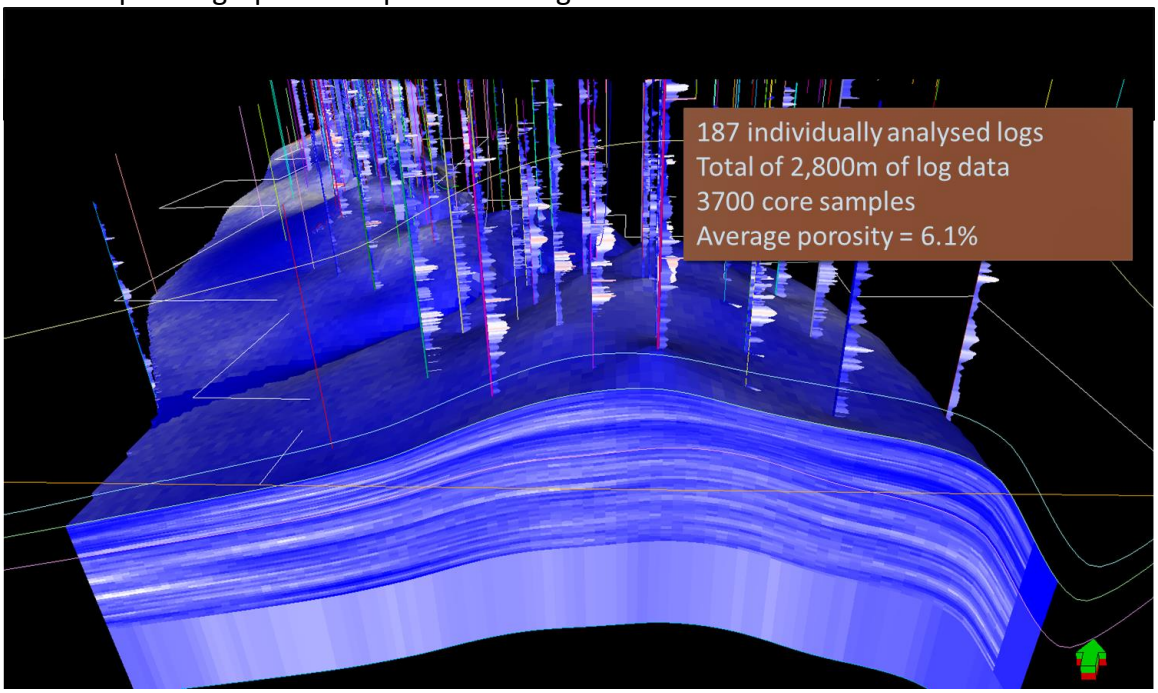


Figure 10 - Cross Section of Porosity from the Geo-model

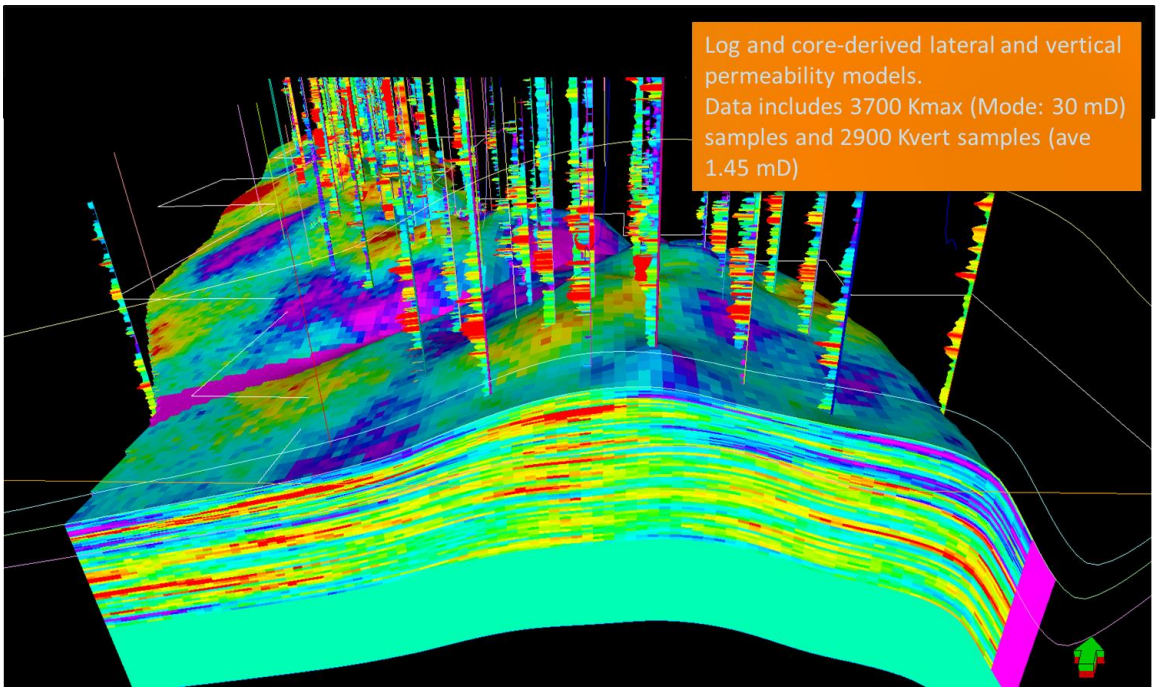


Figure 11- Cross Section of Permeability from the Geo-model

Additional details from the geo- and simulation models were incorporated into the MMV plan in 2017 as discussed in Part B.

Initial pressure and temperature: The temperature at the Clive reservoirs is 69°C (156°F) and its pressure 1,900 psia (13,086 kpaa).

Estimate of storage potential:
The total CO_2 storage capacity at Clive due to replacement of produced oil and gas is estimated at 18.8 million tonnes ("MT") (a more detailed calculation of this estimate is found in section 3.2 of the detailed report).

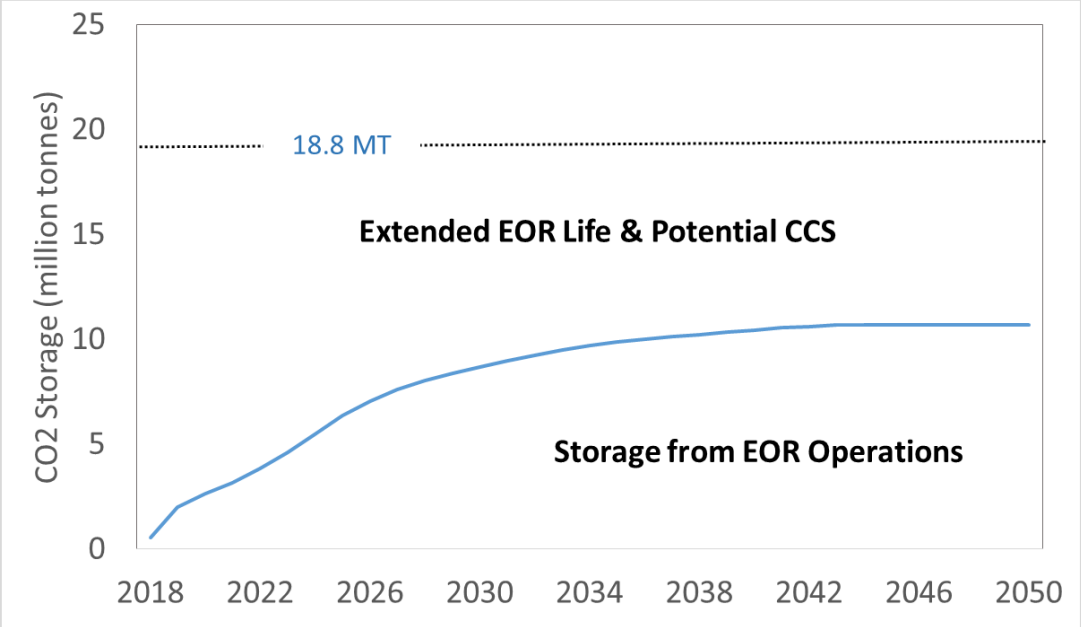


Figure 12 - Predicted EOR Storage and Ultimate Storage Potential (Note: the start date on this Figure will be revised once project schedules are finalised)

Risks of storage into the geological formations and the measures implemented to manage and reduce such risks:

Storage for Enhance's ACTL project will take place at the depleted hydrocarbon reservoir at Clive. As depleted hydrocarbon reservoirs have securely contained fluids for millions of years, these reservoirs are very well suited for containment and safe storage of injected CO_2 and pose very minimal risk of leakage. Depleted hydrocarbon reservoirs in Alberta have typically undergone waterflood operations whereby water has been used to replace produced hydrocarbons. The injectivity of CO_2 is typically estimated to be the same as injectivity of water at reservoir conditions. Such waterfloods have been conducted at Clive, again minimizing any risk of storage in this field.

Enhance completed conducting comprehensive geological and geomechanical studies on the rock (from the bottom of the well to the well head). The outcome of this technical work was used to determine monitoring, measurement and verification(MMV) requirements. The first three phases of the MMV program have been previously completed with Alberta Innovates Technology Futures. Phase IV (the MMV Plan) was completed in 2016 and submitted to Alberta Energy for comment. Based on feedback and new information, Enhance updated the plan in 2017 and expects to submit the updated version in early 2018. Phase V, baseline data collection, is expected to begin in 2018 in conjunction with the complete ACTL project. The following pictorial illustrates the overall program.

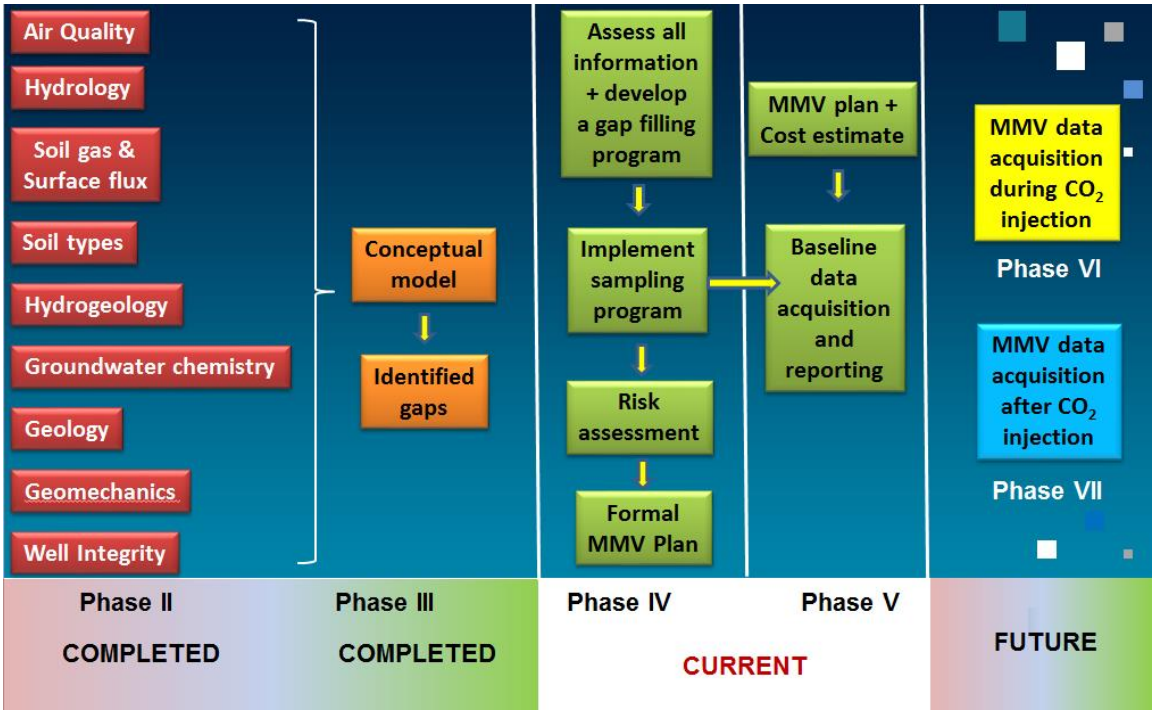


Figure 13- Storage Assessment Process

The next pictorial illustrates the context of the MMV study area and various components that potentially may be quantified.

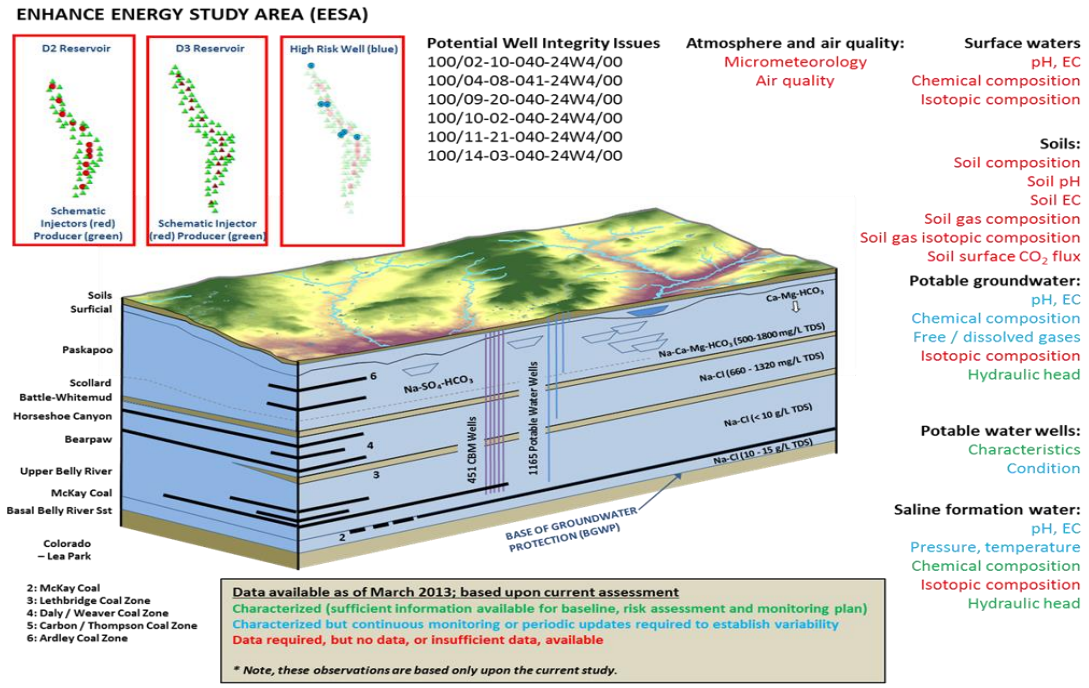


Figure 14- MMV Considerations

Section 4: Facility Operations – Capture

As the project is still in its design phase, the CO_2 capture facilities have yet to start-up. Information regarding the efficiency of each step, impact upon the operating efficiency of the base facility, and purity of the CO_2 is not available at this time.

Section 5: Facility Operations – Transportation

In its first phase, the pipeline will transport captured, compressed CO_2 from the Agrium fertilizer plant and the NWR Sturgeon Refinery plant to selected EOR fields at the end of the pipeline.
Flow capacity: The maximum flow capacity of the pipeline, once filled to its full capacity, is 14.6 million tonnes of CO_2 a year.

Pipeline diameter: The pipeline will be 16" in diameter.

Design pressure and temperature: The maximum operating pressure is 17,926 kPag (2,600 psig). The operating temperature design of the pipeline is between -18°C to 60°C.

Wall thickness: The line pipe is a Nominal Pipe Size ("NPS") at 14.3 mm wall thickness.

Length: The pipeline will be 240 kilometers long.

Material: The 16" ACTL pipeline will be made of electric resistance welded (ERW) carbon steel. The pipe specification shall be Grade 448, Category II M18^{o}C ERW pipe. Pipe supplied shall be fully kilned, fine grained, continuously cast steel. The maximum carbon equivalent calculated shall be as described in CSA Z245.1.

Expected lifetime: The pipeline has an expected lifetime of 100 years or more.

Cathodic protection: A cathodic protection system will be installed as part of the integrity management program. The design of this system is underway as a part of the detailed design for the project. The system will incorporate the following considerations:

- Length of system and segments
- Coating specifications
- Locations of block valves
- Soil analysis and resistivity data
- Water table
- Proximity to other utilities

The pipeline will require cathodic protection test stations to be installed along the route of the pipeline at regular intervals. The pipeline will be fitted with insulating flanged gaskets at each end of the system.

The carbon dioxide water dew-point specification is less than 162mg/m^3 (10 lbs/MMscf); therefore, free water is not present during normal operating conditions, and corrosion due to the formation of Carbonic acid cannot occur. Post hydrostatic testing procedures will be incorporated to ensure the pipeline is dry prior to commissioning and operation. In the event the water dew-point is exceeded at the source, an on-line hydrometer signals an emergency shutdown valve ("ESDV") to close diverting the off-spec gas to vent.

Section 6: Facility Operations – Storage and Monitoring

No CO_2 has been injected and stored, as the project is still in its design phase. Therefore there is no data regarding the injection and storage of CO_2 and its direct monitoring to report at this time.
The planned CO_2 injection rate is the entire available CO_2 supply volume currently estimated at 4,300 tonnes of CO_2 per day. The minimum requirements for the CO_2 injection stream composition, pressure and temperature are as follows:

- 95 mol percent minimum CO_2
- No more than 2 mol% hydrocarbons with a dewpoint not exceeding -20°F
- No more than 3 lb/mmscf of glycol or amines or ammonia or methanol
- No more than 10 lb/mmscf of water
- No more than 4 ppm H_2S by volume
- No more than 16 ppm total Sulphur by volume
- Less than 1.0% N_2, H_2, CO, AR, or CH_4 each and total inerts less than 4% by volume
- Less than 0.1% O_2
- Less than 100 ppm SOx or NOx by volume
- Less than 1 ppb Hg by volume
- No solid particles
- No free liquids including lube oils or glycol
- CO_2 shall be delivered at less than 25°C (77°F) and at 2,600 psig (17,926 kPag).

Monitoring techniques that will be employed at the injection site will be detailed in the updated MMV plan which is expected to be submitted in early 2018. The individual well injection rates will range from 200 to greater than 1000 tonnes CO_2 per day. CO_2 recycle rates will be finalized as project moves into operations – initial reservoir modelling indicates up to 5000 tonnes CO_2 per day. Atmospheric CO_2 emissions in the scheme are limited to screwed connections for pipe 2" and smaller and flanged connections for pipe 3" and larger. Some emissions to the atmosphere will also occur during facility shutdowns and start-up. However, these emissions are considered to be fugitive emissions and are expected to be negligible.

Section 7: Facility Operations – Maintenance and Repairs

As the ACTL is not yet operational, there are no maintenance and repair activities to report at this time.

Section 8: Regulatory Approvals

Enhance Approvals

No unusual hurdles were encountered throughout the application and approval process. The following table indicates approvals obtained by Enhance for the ACTL project:

Consent/Permit	General Timeline of Approval Receipt	Additional Hurdles Encountered
Canadian Environmental Assessment Agency ("CEAA")	Submitted: January 2010 Approved: September 7th, 2010	None
Development Permit (County Level)	Sturgeon County has confirmed that a development permit is not required for a pipeline at the Agrium facility.	None
Alberta Historical Resources Foundation ("AHRF")	Submitted: May 13th, 2009 Approved: August 17th, 2012 Approved: July 2, 2015 for routing amendments	Ongoing routing changes delayed application process
AER Directive 56 Pipeline Installation Approval (incorporates Alberta Environments and Parks approval)	Public consultation process: October 2008 – March 2009 Applied: March 20, 2009 Approved: April 26, 2011 License Number: 53252	On-going consultation required after approval
Conservation Reclamation Plan (Alberta Environments and Parks)	Submitted: March 18th, 2009 Approved: April 17th, 2013	None
Alberta Energy Regulator ("AER") (Draft EOR Application; D-51 and 65)	Submitted in December 2013 and reviewed by AER. A formal D-65 Application was submitted in December 2017.	None

Alberta Energy Regulator ("AER")	Minor amendments to transmission and gathering line accepted September 2014; Licence #53252	None
Alberta Energy Regulator ("AER")	Minor compressor station (Agrium Capture Facilities) amendments accepted October 2014; Licence #53252	None
Alberta Energy Regulator ("AER")	North Saskatchewan River spare pipeline approved November 2014; Licence #56775 extended to November 21, 2018.	None
Alberta Energy Regulator ("AER")	Above ground low pressure CO_2 source pipeline Licence #56943 Approval extended to January 9, 2018	None
Alberta Energy Regulator ("AER")	Above ground waste water pipeline Licence #56821 Approval extended to December 4, 2018	None

Table 1 - Enhance Regulatory Approvals Table

NWR Approvals

All necessary regulatory approvals have been obtained to proceed with the construction and operation of the NWR Sturgeon Refinery project. The table below describes the approvals obtained by NWR.

BODY/ACT/ REGULATION	APPROVAL/PERMIT/ DESCRIPTION	UPDATE/NOTES
Oil and Gas Conservation Act	Upgrader Approval No. 10994 dated September 6, 2007 / For construction and Operation of an oil sands bitumen upgrader, no expiry	All Approvals are held by North West Redwater Partnership Holdings Corp.
Environmental Protection and Enhancement Act	Approval No. 217118-00-00 dated September 20, 2007 to construct, operate and reclaim the facility, as amended occasionally to date. Approval expires September 1, 2017. Application for renewal was submitted September 1, 2016, with renewal commitment prior to Sept 1, 2017	The renewal was approved in 2017.
Water Act (Water Licence)	Approval No. 00227771-00-00 as amended occasionally to divert of water from site Precipitation and North Sask River for process. Approval expires September 1, 2017. Application for renewal was submitted September 1, 2016, with renewal commitment prior to Sept 1, 2017	The renewal was approved in 2017
Sturgeon County/Land Use Bylaw 819/96	Development and Building Permits 305-07-D0347 305-07-D0399 305-07-D0609 305-07-D0610 305-08-D0001 305-07-D0611 305-07-D0631	All Development Permits have been initiated and remain valid through to completion of Phase 1
Sturgeon County/The Inspections Group Inc/Safety Codes Act and Codes	Various Safety Codes Permits as required for gas fitting, plumbing, electrical per associate Codes, both for temporary and permanent facilities within the Refinery site. Hundreds of such permits are issued	NWR applied for and is approved by the Safety Codes Council to administer Safety Codes Act approvals required for the Project as at May 2013

	for various buildings and tasks throughout the site, and are considered routine	
Alberta Transportation Highways Development and Protection Act	Alberta Transportation/Highways Development and Protection Act Roadside Development Permit 2511/049/10 and RDP 2511/310/13	RDP 2511/049/10 and RDP 2511/310/13 have been issued in respect of the complete construction and operation of Phase 1 of the Project
Alberta Sustainable Resource Development/Public Lands Act	Temporary Field Authorizations for water course realignment TFA 126500 as issued November 19, 2012	Work under this TFA has been completed
Alberta Community Development/ Historical Resources Act	Clearance Letter (note that his resulted in the AER Public Interest Determination) Release Date: February 1, 2006 Release Date: November 29, 2006	Work under this clearance has been completed
Industry Canada/Radio Communication Act and Regulations	Mobile radio licence for use by construction and Operations workforce	No Change
Alberta Energy Regulator – Pipeline Act	Pipeline licences for lines across North Saskatchewan River as per recent Bennett Jones assistance re applications. Have been issued to NWU	All required Pipeline Licences have been received and all off-site pipelines installed but not yet operational
Oil and Gas Conservation Act	Upgrader Approval No. 10994 dated September 6, 2007 / For construction and Operation of an oil sands bitumen upgrader, no expiry	All Approvals are held by North West Redwater Partnership Holdings Corp

Table 2 - NWR Regulatory Approvals Table

Note: Permits with expiry dates prior to initialization will be reapplied for as required to meet the construction schedule

Section 9: Public Engagement

Enhance

Enhance has undertaken an extensive and open public engagement program working with all directly or potentially impacted landowners and occupants, local authorities, industry stakeholders, and provincials regulators (Stakeholders). An open house was held in Clive in March 2017 where Enhance staff shared the latest information and answered questions on the project. Enhance sends an annual newsletter to stakeholders with project updates as a continuing activity of the public awareness program. Stakeholders are further described and

listed in Section 4.2 of the detailed Knowledge Sharing Report. A detailed account of Enhance's public engagement is found in Appendix xii of the detailed report.

Below is a table of the main questions and concerns raised at meetings and open houses along with Enhance's responses.

QUESTION	ENHANCE RESPONSE
How deep in the ground does the pipeline get constructed?	Typical construction practice of 1.2 meters unless special conditions warrant a change to cover depth.
What is the operating pressure of the pipeline?	In response this concern Enhance shared the following information with interested parties: - The proposed line pressure, which is 2600 psi; - The proposed wall thickness; and - The planned integrity management plan, including the intended inspection of the pipeline regulatory requirements.
How is the post construction vegetation going to be managed?	The Right of Way and Temporary Work Space lands will be fenced on pasture lands or lands identified by a landowner for a two year growing season to ensure proper regrowth.
Regarding fencing on the quarter section boundary line (existing and new), would Enhance clean up the brush on fence lines and establish new fence boundaries?	Fence lines would be established by way of survey and new fence will be constructed during final clean up if required.
What will be the means of access across the Right of Way during construction?	The necessary measures will be put in place (gates, plugs etc.) as required and arranged during initial acquisition process, and would also be discussed with the landowner during the pre-construction meeting.
Are there going to be Above Ground Structures?	No installation of any above ground structures required unless previously communicated and negotiated and accepted by the landowner.
What are the setbacks from the pipeline Right of Way?	The pipeline does not have any regulated setbacks other than the Right of Way boundary and outside of the regulated 30 meter safety zone.
What are the conditions of the Right of Way through a treed area/bush land?	The Right of Way will be left in a condition that would allow the landowner to work the land as with the adjoining lands on the quarter. Pasture land would be left as pasture, with the exception of any grazing lease

	lands, which under current regulations, have less stringent cleanup requirements but are still governed by best use land policy.
How is trespassing managed – What measures are in place to keep the workers within the area of construction activities?	All boundaries are staked out by the survey team, workers are informed of the work area limits and under normal circumstances workers will not be outside of the staked area. Landowners were advised that they (the landowners) are another set of eyes to monitor the situation, and if the workers are beyond the staked limits, the landowners should be contacting a company representative.
How much restriction will I (the landowner) endure with respect to moving farming equipment across the pipeline after it's in the ground?	Normal/Typical farming practises will be permitted to cross the pipeline Right of Way.

Table 3- Main Questions and Concerns

NWR

A commitment to extensive public consultation by NWR for use in project decision making was made in 2005 at the outset of the environmental impact assessment ("EIA") and regulatory application process. At that time, CCS solutions for the project were not well advanced. Subsequently, the project was described in regulatory applications and communications with stakeholders as being carbon capture ready with the view that reducing the CO_2 emissions for the project was an important goal.

NWR conducted personal consultations with all stakeholders within the local area, as well as with any person or organization that expressed a direct interest in the project. A confidential stakeholder contact list was prepared and is maintained to facilitate stakeholder communications.

Open houses in Redwater, Alberta were held in February 2005 upon public disclosure of the project and in November 2005, after collection of environmental data. The two open houses were attended by over 300 persons representing a range of interests and which generated hundreds of questions and comments.

Issues and concerns expressed by stakeholders were primarily in regards to government policy including the need for new regulatory requirements, municipal land use planning, and civil and other social infrastructure including roads that support anticipated development in the industrial heartland area. NWR has committed to constructively participate with stakeholders, residents, industry and governments in the region to understand their ongoing issues concerns and develop workable solutions.

The AER Decision Report 2007-058 (August 7th, 2007) notes that "The Board considers North West's participant involvement program to be extensive. North West was proactive in its approach to involve the public at the early stages of project development and included both those potentially affected by the proposed project and others who expressed an interest in the project…. The board concludes that North West has met and exceeded the Board's public consultation requirements."

Since receiving AER approval to build the project in 2007, Project personnel have continued stakeholder consultation through personal consultations, participation in community advisory panel meetings, public information sessions and periodic public newsletters.

NWR is also a participant in multi-stakeholder committees facilitated by Alberta Environment and Parks related to Cumulative Effects Management in Alberta generally, and the Industrial Heartland area specifically. CCS is one of the topics discussed, along with other emissions and project effects.

Section 10: Costs and Revenues

Costs

Enhance Energy Capital Costs

Capital Cost Estimates	Total ($MM)	Spend to Date ($MM)	Forecast to Complete ($MM)
Agrium CRF	$ 55	$ 21	$ 34
NWR CRF (Booster and Main Compression)	$ 90	$ 50	$ 40
Pipeline	$ 260	$ 30	$ 230
Clive CO_2 Injection	$ 100	$ 2	$ 98
Total	**$ 505**	**$ 103**	**$ 402**

Table 4 - Enhance Capital Costs

NWR CRF costs have increased approximately $10 MM due to increased installation costs within Sturgeon refinery for the Booster compressor (forecast at ~$53 MM vs $48 MM budget), and increased cost of Main compressor due to increased material and vendor activity. Enhance has incurred approximately $123 Million with inclusion of general project expenditures under the CCS Funding Agreement to date (December 31st, 2017).

Compression	Annual Average Cost
Agrium CRF	
Electricity ($/MWh)	$ 81
Total Variable ($/tonne CO_2 captured)	$ 10
Total Maintenance and Turnaround ($/tonne CO_2 captured)	$ 4
Total Fixed ($/tonne CO_2 captured)	$ 5
NWR CRF (Booster and Main Compression)	
Electricity ($/MWh)	$ 83
Total Variable ($/tonne CO_2 captured)	$ 10
Total Maintenance and turnaround ($/tonne CO_2 captured)	$ 1
Total Fixed ($/tonne CO_2 captured)	$ 1
Pipeline	
Electricity ($/MWh)	$ 81
Total Variable ($/tonne CO_2 captured)	$ 0.4
Total Maintenance ($/tonne CO_2 captured)	$ 1
Total Fixed ($/tonne CO_2 captured)	$ 5
Clive	
MMV ($/tonne CO_2 captured)	$ 2

Revenues

There are no revenues to report as the project is not yet operating. Enhance has received $56.9M of Federal funding through the ecoETI and CEF programs. Enhance has also received the first milestone payment from the Provincial CCS program of $4.5M, which is secured by a Letter of Credit to the provincial government.

NWR Rectisol®

NWR Rectisol® Unit

The Rectisol® cost estimate prepared in 2013 is shown in Table 6 and 7.

CAPEX

Table 6 – Rectisol® CAPEX Estimate

DBM/EDS Engineering	7.0
Detailed Engineering	32.5
Equipment	100.2
Material	86.3
Construction	151.5
Commissioning & Startup	18.9
Contingency	10.2
Owners	10.5
Total	417.1

Table 6 - Rectisol® Capital Costs

Canadian Content

The local socio-economic activity from on-site construction of the gasifier unit and off-site module fabrication is expected to be significant. An international firm with significant operations and history in Alberta has been selected to bring integrated engineering, design, procurement, module fabrication, construction and site management services to the project. A forecast of Canadian content for the Rectisol® unit will be prepared as construction planning progresses.

OPEX

The operating cost of the Rectisol® unit is provided for informational purposes and should not be used for comparing or benchmarking against other CCS projects.

Table 7 – Rectisol® OPEX Estimate (not for inclusion in carbon capture cost profile)

Categories	$/tonne CO_2	Percent
Direct Operating Costs		
Steam and Electricity[2]	7.46	52
Solvent	0.11	1
Total Direct Costs	**7.57**	**53**

Indirect Operating Costs		
G&A	2.41	17
Maintenance	2.87	20
Turnaround	1.03	7
Water Services	0.34	2
Total Indirect Costs	**6.65**	**47**
Total Operating Cost	**14.22**	**100**

1) Based on forecast avoided emissions of 1,211,341 tonnes/year (which does not include emissions associated with electricity used for compression to pipeline).
2) Assumed cost of electricity is $80/MWh.

Table 7 - Rectisol® Operating Costs

Revenues

No industry benchmarks are available at this time. There is no revenue to report at this time other than $9.9M and $19.8M payments from the first and second milestones under the Provincial CCS Program, which are secured by a Letter of Credit to the provincial government.

Section 11: Project Timeline

Enhance Timeline

Shifts in the timeline were initially made to accommodate NWR's construction timeline and to avoid prolonged increased costs of operating the pipeline without full initial volumes. In the past year, project financing has proved to be the biggest hurdle. Enhance now expects to kick-off pipeline construction and drilling and site work at Clive in early 2018.

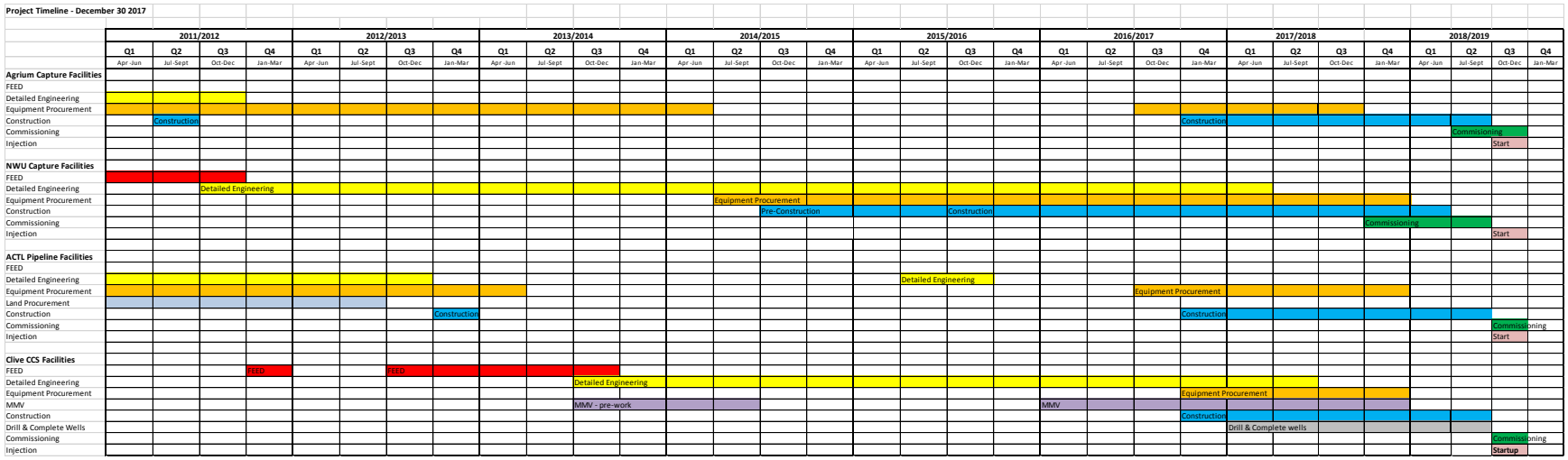


Figure 15- Enhance Project Timeline

Above is the Enhance timeline as of December 31st, 2017 (a higher resolution version of the timeline can be found in Appendix xiof the detailed report).

NWR Timeline

NWR Timeline

The NWR schedule of CCS project milestones is shown below. Funding for Milestone# 1 was achieved in September 2015 and Milestone #2 was achieved in June 2017. Milestone # 3 has been delayed and achievement is now expected in calendar Q2 2018. These delays are a result of normal construction delays. Commencement of CO_2 deliveries to Enhance has shifted to calendar Q4 2019 contingent on the Enhance Main Compressor installation and commissioning.

NWR Project Schedule - CO_2 Capture

Milestone	Calendar Year / Change from Previous Report	2015				2016				2017				2018				2019			
		JFM	AMJ	JAS	OND	JFM	AMJ	JAS	OND	JFM	AMJ	JAS	OND	JFM	AMJ	JAS	OND	JFM	AMJ	JAS	OND
		1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Detailed Design	No																				
Site Wide Refinery Construction	No																				
Gasifier & Rectisol Construction	No																				
1. Piling Complete - Rectisol	No																				
2. Rectisol Construction 50% Complete	No																				
3. Rectisol Mechanical Completion	No																				
Commissioning & Startup	Yes																				
Commercial Operation - CO_2 Compression	Yes																				

Figure 16- NWR Project Timeline

Section 12: General Project Assessment

Successes and learnings arising from the project

The ACTL project is expected to encourage the development of an eco-industrial petrochemical cluster of additional value-added upgrading, refining, and petrochemicals projects that take advantage of sustainable and cost-effective solutions for CO_2 emissions. Once operational, the ACTL is strategically positioned to launch an integrated CCS sector and establish Alberta as a globally recognized leader for CCS and EOR technology. To date, the project has been successful in passing through key commercial, public consultation, regulatory, financial and design hurdles. Enhance and NWR will build on these successes as the project moves from construction into the operation phase.

The overall ACTL project is currently behind the original schedule. Reduced oil prices have required Enhance to optimize and right size project plans and reduce cost structure, to ensure a positive economic outcome in a “lower for longer” oil price environment. This activity consisted

primarily of optimizing construction methods and re-bidding major activities and equipment. Tougher financial markets have also delayed the construction timeline, and continued to be a challenge in 2017. Enhance is optimistic that financing negotiations will be completed in early 2018 allowing project construction to be commenced and CO_2 injection at Clive to begin close to year-end.

Start-up of the NWR Sturgeon Refinery Rectisol® Unit CO_2 capture system, operated by NWR has also been somewhat delayed due to normal construction issues.

Overall, however, the ACTL project continues to make progress with anticipated commissioning of Agrium CO_2 volumes in early to late-2018 and NWR volumes thereafter.

Landowner acceptance
There are approximately 400 landowners along the ACTL who have been externally supportive of the project. This is a significant achievement and it highlights public support for the ACTL. Enhance's strong commitment to community engagement is evident in the fact that landowners readily accept the pipeline being built underneath their land. This level of acceptance occurs once all community questions and concerns have been adequately addressed and risks have been shown to be minimal.

Procurement of major equipment
Significant pieces of equipment have been purchased for both the Agrium facilities and the pipeline. The two inlet condensers, inlet separator, six stage compressor, dehydration package, and refrigeration package (shown in Figure 17) have been completed.

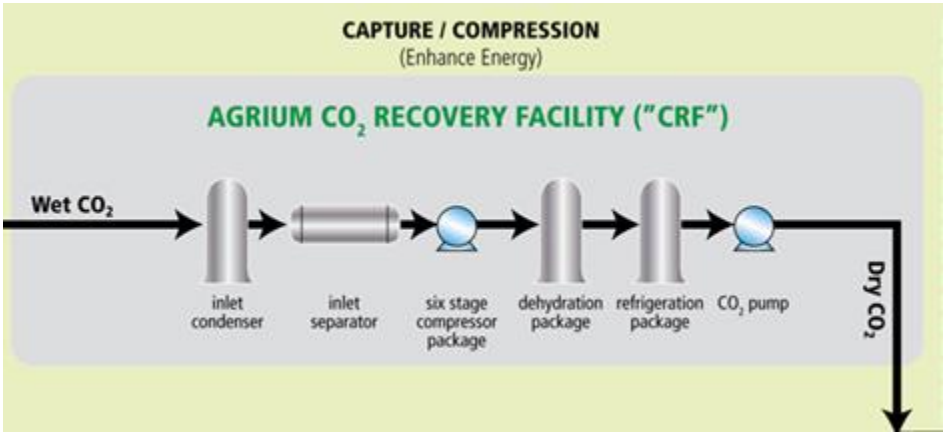


Figure 17- Agrium CRF Equipment Diagram

Pipeline valves and actuators have also been delivered.
The Booster Compressor for the NWR capture system has been delivered and installed.

Regulatory approvals in place for pipeline

Enhance received its CEAA approval on September 7, 2010 and its AER permit to construct on April 26, 2011. A major accomplishment was receiving the AER permit. The Board granted the ACTL a permit as the project met all of the requirements of Directive 56, and there were no relevant outstanding issues or concerns. Enhance was also been successful in securing an extension of AER Licence #56775 for a spare pipeline under the North Saskatchewan River which is required due to delays in project commencement.

Achievement of the project's first milestone
Enhance met its first project milestone, "Issue of Construction Drawings for the Agrium Capture Facilities", in early 2012. Meeting this milestone was a large undertaking, resulting in over 850 detailed issued for construction drawings and required more than 30,000 engineering man-hours. Approximately 26,000 of those man-hours were expended in Alberta. Completing this aspect of the project helped finalize the front end engineering stage of the project and acts as an important stepping stone as the ACTL proceeds with the project.

NWR met its second milestone, "Rectisol® 50 % Construction Complete" during 2017. As of year-end 2017, the Rectisol® Unit specific construction was 95% complete.

Knowledge sharing
Enhance and NWR have committed to provide updates and deliver presentations to the community, industry and government in order to promote awareness about the ACTL project and highlight its benefits to a wide audience. As part of this commitment, Enhance and NWR have spent considerable time preparing knowledge sharing reports for the provincial and federal governments and the general public.

Government funding
The ACTL project has benefited from both the Province of Alberta and Government of Canada funding. Province of Alberta funds are paid once specific milestones are met; $4.5 million to Enhance and $29.7 million to NWR (out of a total $495 million) has been received to date. The Government of Canada funds ($63.2 million (less a 10% holdback)) were released in full as the Project incurred sufficient eligible costs. The opportunity to access Federal funds early in the project has been critical to moving the ACTL project forward during an economic downturn in capital markets. Having access to the capital early in the project has supported the purchase of equipment and helped move the project from its design phase towards construction.

Electricity Power Requirements
Acquiring power for a project in Alberta from the Alberta Interconnected Electrical System (AIES) can be a very long process, and usually takes a minimum of two years. Understanding the long lead time for this aspect of the project, and proactively ensuring that the ACTL project remains on track, Enhance has begun to work closely with the local power distribution service provider. The Enhance engineering team has finalized power delivery infrastructure for the Agrium site and continues optimisation of plans for the NWR site.

Direct economic benefits to Alberta

The ACTL has already had a direct economic impact in Alberta, through the creation of jobs and procurement of equipment, even though the project is still in its design stage. These benefits are measured in terms of man-hours expended and equipment manufactured in the Province. Approximately 230,000 man-hours have been expended to date on the project. 26,000 of those hours are engineering work done in 2011 to complete the first milestone "Issuance of Construction Drawings for the Agrium Capture Facilities." An additional 14,000 man-hours were required to complete the Agrium CRF tie-ins in June 2011, and over 50,000 man-hours have been expended to date on the pipeline. Being a small Alberta based company; Enhance has always been committed to supporting more Alberta businesses. Direct efforts have been made to keep the majority of work in the Province. As shown in the two tables below, the majority of equipment for the pipeline and the large of the equipment for the Agrium CRF were procured for the project within the Province.

ACTL Pipeline Procurement

Equipment/Service	Vendor	Location
Engineering	SAW Engineering	Alberta
Environmental Assessment	Worley	Alberta
Environmental Planning	BOSS Environmental	Alberta
Regulatory	CH2M Hill	Alberta
Valves	KTI Limited	Alberta
Survey	Focus Surveys	Alberta
Geotechnical Assessment	Surface Search	Alberta
Land Acquisition	LandSolutions	Alberta

Table 4 - ACTL Pipeline Procurement List

Agrium CRF Procurement

Equipment/Service	Vendor	Location
Inlet Separator	Bilton Welding	Alberta
Inlet Piping	Comco	Alberta
Pipe, Valves, Fittings	Comco & Pinnacle	Alberta
Dehydration Skid	Ensign/Opsco	Alberta
Air Cooled Exchangers	Exchanger Industries	Alberta
Glycol Pump	Smith Cameron Pump	Alberta
Refrigeration Skid	Startec	Alberta
CO_2 Transfer Pump	National Process Equipment	Alberta
Environmental Planning	BOSS Environmental	Alberta
Regulatory	CH2M Hill	Alberta
Inlet Condenser	Alfa Laval	Ontario
CO_2 Booster Pump	Clyde Union Canada	Ontario
Compressor	Siemens	Germany
Electrical Engineering and Controls	Beta Tech Inc.	Alberta

Table 5 - Agrium CRF Procurement List

Economic benefit to Canada

Enhance bought two pieces of equipment not manufactured in Alberta from Ontario. Unable to find manufacturers for the inlet condenser and the CO_2 Booster Pump in Alberta, Enhance preferred to have a Canadian supplier for these pieces so as to extend as much benefit as possible to Canadians.

Opportunity to build expertise

One piece of equipment that Enhance has had to order for the project from outside of Canada is the six-stage compressor for the Agrium CRF, which is being designed in Germany by Siemens. A Canadian manufactured compressor would have been preferred, however the technology and manufacturing capability has been built up in Germany over 50 years, and is hard to replicate here in a short time frame.

Enhance continued to refine our understanding of the Clive storage complex in 2017. With a refined geo-model and history matched simulation model behind us in 2016, the main efforts in 2017 focussed on more fully integrating these tools into our MMV plans and on refining our understanding of the regional hydrodynamics of the area.

Indirect economic benefits of the project for Alberta and Canada
Enhance commissioned the Canadian Energy Research Institute to conduct a study on the economic impact of the ACTL project. The study concluded that the estimated economic value of the overall integrated project, at design capacity, could increase Canada's total economic output by $231 billion (approximately 80% of the impact in Alberta) and provide an additional 848,800 person-years of employment (approximately 70% of the impact in Alberta).

No additional project learnings for the 2017 reporting period.

Section 13: Next Steps

The NWR Sturgeon Refinery Project is virtually complete. Significant progress was made in 2017 with overall project progress at 99% and overall project construction progress at 99 % complete at year-end 2017. The refinery began operations on a limited basis in late 2017 as part of an extended commissioning plan and first diesel was produced and sold in December. The key component of the CCS project, the Rectisol® Unit was 95% complete at the end of 2017. Although significant activity has been completed, several key components of the Rectisol® Unit still require work to complete throughout 2018 including commissioning activities.

Enhance is focused on many varied tasks for the 2018 calendar year. The main area of focus will be finalizing financing which will allow issuance of construction contracts and procurement of major equipment such as pipe and compression as well as initiating relevant construction activities upon final investment decision.

Enhance finalised initial development plans for the project in 2017, conducted the required public consultation and submitted the AER D-65 application for the project in December 2017. Enhance will continue to work with the AER and all other involved regulatory agencies in 2018 to ensure all approvals are in place to allow the project to proceed.

Changes in the project plan and timeline

The ACTL is forecast to start-up with Agrium volumes in late-2018 and NWR volumes coming on-stream thereafter with deliveryand installation of the main compressor believed to be the critical path in this schedule.

Since the project's inception, the only changes to the project plan have been timeline changes with respect to alignment of the project activities. The most up to date schedules are shown in Figures 15 and 16 above.