



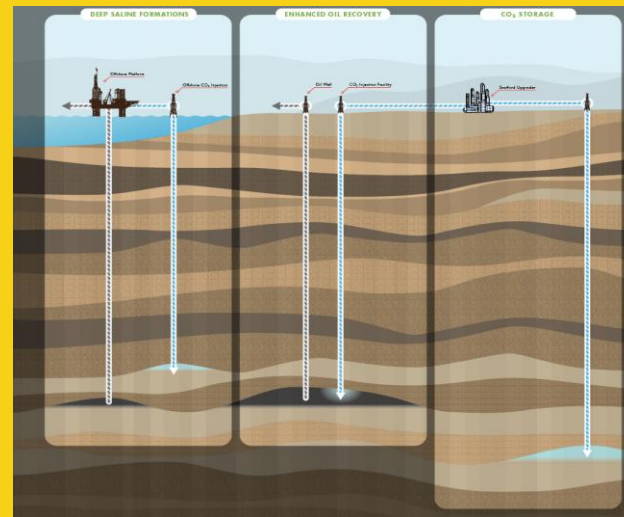
QUEST Carbon Capture & Storage Project

Role of Government in Regulation of Best Practices Stakeholder Engagement

IEA International

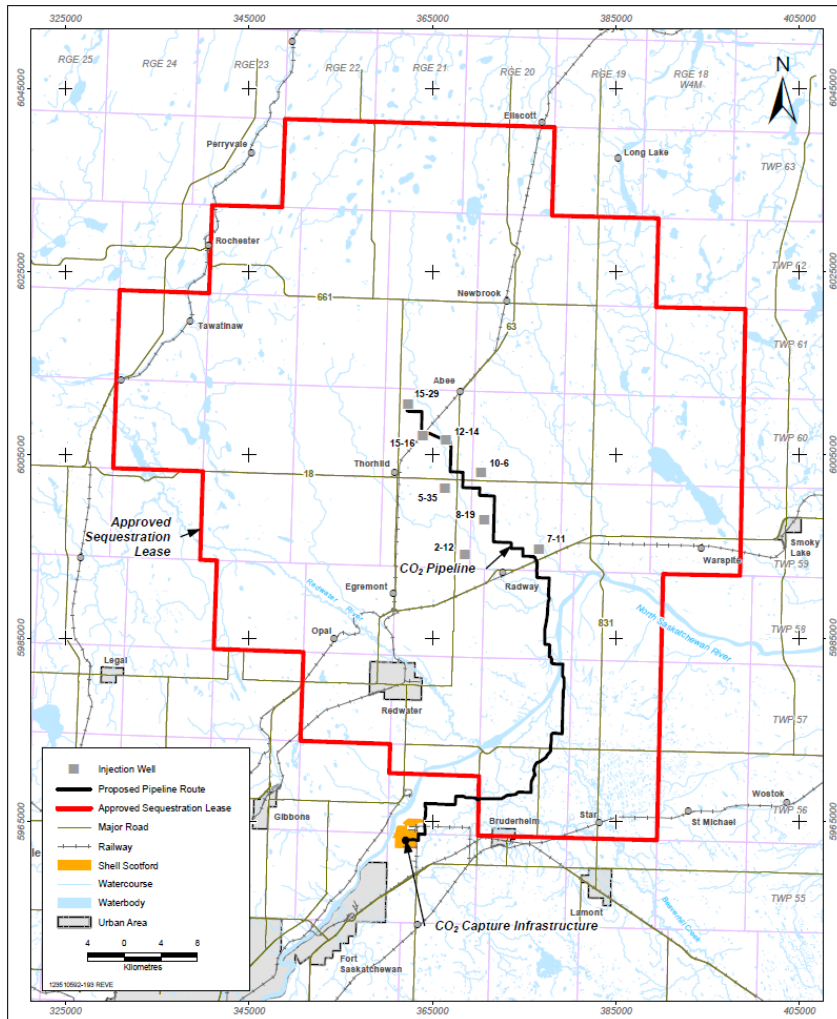
CCS Regulatory Network Meeting

June 18-19, 2013



J.P. Jepp- Regulatory Policy Advisor, Shell Canada

Quest- Project Overview



- **Capture and Compression**
 - Capture at Shell Scotford Upgrader- amines
 - CO₂ source 3 x HMUs (SMR technology)
 - Up to 1.2 Mtpa CO₂ ; CO₂ > 95% purity
- **Pipeline**
 - Agricultural lands with distributed population
 - 12 inch line; about 80 km length
 - Laterals pipelines from main to wellheads
- **Disposal Scheme**
 - 3-8 wells
 - Target zone is saline aquifer- over 2000m depth
 - 39+ townships Area of Interest (AOI)
- **Project Status**
 - March 2012- Regulatory Hearing
 - July 2012- Regulatory Approvals
 - Sept 2012- Final Investment Decision!!
 - Q4 2012- Construction Commenced

Quest- Milestones/ Timelines

- Pore Space Tenure (Alberta Energy- Sequestration Leases)
- Well Licenses (ERCB- Directive 56)
- Pipeline License (ERCB- Directive 56)
- Capture Infrastructure (ERCB- OSCA Amendment)
- CO₂ Disposal Permit (ERCB- Directive 65)
- Environmental Assessment (Alberta Environment)
- Environmental Impact Assessment (Environment Canada)
- MMV Plan / Closure Plan (Alberta Energy)



Quest- Assumptions Stakeholder Engagement

- There would be a lot of public interest- in the technology and in the project
- There would be concerns because of the 'newness' of the technology
- Some stakeholders would be against the project- due to it being an enabler for oilsands
- The low levels of public knowledge on CCS required the project engage in a broader outreach program



Quest– Consultation Principles

- Comprehensive and thorough consultation
- Start consultation early
- Include potentially affected parties outside the minimum required notification areas
- Engage general public, academics, community, community leaders, other
- Recognize legitimacy of stakeholder concerns and valuable input can provide
- Provide the information needed so that stakeholders can fully participate in the process
- Adapt plans based on stakeholder input, and provide feedback on how input has affected plans
- Transparency- in technical conclusions
- Adhere to the full regulatory process



Quest- Community Engagement

- Municipal Council Meetings
 - 5 municipalities
- Quest Café's
 - Focused Q&A engagement with community leaders
- Open Houses
 - 4 communities x 3 rounds
- Newsletter- annual
- Community Events
- Application Materials
 - available on Shell website and in hard copy at community locations
- Community Advisory Panel
 - To be convened for operations phase

QUEST FOR LESS CO₂

YOUR INFORMATION SOURCE ON SHELL'S PROPOSED QUEST CARBON CAPTURE AND STORAGE PROJECT

SHELL'S QUEST PROJECT IS A PART OF THE ALBERTA CCS MARKET PROJECT, A \$2.05 BILLION INVESTMENT THAT CAPTURES AND STORES CARBON DIOXIDE FROM THE COKE OVEN AND GASIFICATION COKE GASIFICATION PROCESS AT THE COKE


SPRING 2011

WELCOME TO QUEST

Shell welcomes you to the first edition of the Quest newsletter. Quest is a Carbon Capture and Storage (CCS) Project being prepared by Shell to reduce CO₂ emissions from its oil sands operations.

Shell began consulting with the community on the project in 2008 and will continue to talk with and listen to communities, lawmakers, government and other stakeholders throughout the life of the project.

The aim of this newsletter is to provide information on the project and answer any questions that you may have. We welcome your feedback. Quest contact information is included on the back page of this newsletter.



Proposed route for the pipeline that will transport CO₂ up to 60 km north of the Scotford Upgrader to injection wells.

WHAT IS CCS? WHY IS IT IMPORTANT?

Carbon capture and storage, or CCS for short, is a technology that captures and stores the carbon dioxide released from large industrial facilities so that it does not enter the atmosphere. CO₂ is produced when coal, gas and oil are burned to produce energy. The resulting CO₂ emissions from power plants and heavy industry can then be captured and pumped back deep underground – essentially returning the carbon to where it came from in the first place.

The technology used to capture, transport and store CO₂ is not new and has been developed over many years. There is almost 100 years of experience in injecting natural gas underground for temporary storage of hundreds of sites across North America and Europe. And there is 25+ years of experience with injecting CO₂ for enhanced oil recovery (EOR) in North America.

CCS has been identified as one of the most promising technologies to reduce CO₂ emissions and combat climate change. The Global CCS Institute has stated that there are more than 200 CCS projects planned or active worldwide. Today, however, there are only a handful of projects operating on a large, industrial scale. The early projects, like Quest, will provide valuable knowledge that will be essential in helping to pave the way for projects to follow.

MARK YOUR CALENDARS

SEPTEMBER QUEST OPEN HOUSES

Monday, Sept 19th
Fort Saskatchewan – Deer Central Centre

Tuesday, Sept 20th
Redway – Redway Agriculture

Wednesday, Sept 21st
Thorold – Thorold Community Centre

Thursday, Sept 22nd
Stadheim – Stadheim Community Hall

DID YOU KNOW

Two formations that can be used to permanently store CO₂ are depleted oil and gas reservoirs and saline formations. The Quest Project will be injecting CO₂ into saline formations, which is porous rock containing very salty or anhydrous water. Here it becomes trapped within the pore space of the rock. Cap rock overlying the storage formation provides the final of many seals that prevent the CO₂ from migrating upwards.

QUEST AT A GLANCE


Quest is a fully integrated CCS Project that will use existing technology to capture, transport, store and reutilize CO₂.

The project will capture more than one million tonnes of CO₂ per year from the Scotford Upgrader, located near Fort Saskatchewan. This is the equivalent of the emissions generated by 175,000 cars. The CO₂ will be dehydrated and compressed into a dense fluid for safe pipeline transport.

- Transport the CO₂ by pipeline up to 60 kilometers to between 2 to 10 injection wells.
- Inject the CO₂ more than two kilometers underground. The CO₂ will be trapped within tiny pore spaces between the grains of the sandstone rock formation and by dissolving into the brine of the saline formations. There are multiple, impermeable shale and salt sealing rocks above the storage formation to ensure the injected CO₂ remains permanently and safely trapped underground.

Work Continues to Progress Quest

Milestone achieved with regulatory submission



seismic surveys and test wells – confirms its suitability for storage. These test wells have been drilled to date. The third of these wells, drilled in the second half of 2010 near Redway, has also been identified as a potential injection well. To test its suitability as an injection well, non-potable water was injected to the site and injected into the storage formation more than two kilometers underground. It was used to confirm injectivity because it is compatible with the saline water naturally found in the storage rock reservoir.

Over the past couple of years, Shell has continued work to advance the Quest Project including engineering and design work, pipeline routing, the collection of baseline environmental data, and subsurface appraisal activities. At the end of November 2010 the Quest Project achieved a significant milestone with the submission of regulatory applications.

An appropriate CO₂ storage site has to have a couple of important characteristics. First, it must have a layer of porous rock located underground of the appropriate depth with sufficient storage capacity. And secondly, and most importantly, it must have one or more dense layers of impermeable rock above the storage formation to provide effective barriers to keep the CO₂ contained. Collaborative work done by Shell to map out the subsurface where we propose to inject CO₂ – using data from

QUEST 1

Role of Government- Best Practices

- Government sets the requirements
 - Minimum distances for engagement
 - Classes stakeholders to be engaged in participant involvement program
 - Consultation vs. notification
 - Information on the full project, not parts
 - MMV Plan/Surface access
 - Emergency Response
- Requirements specific to the technology- not necessarily O&G
- Inclusive interpretation of who to be included in consultation/hearing
- Alberta RFA- # of recommendations on stakeholder engagement

