

Equivalent Land Capability Workshop Summary Notes

Oil Sands Research and Information Network
University of Alberta

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Oil Sands Research and Information Network

OSRIN is a university-based, independent organization that compiles, interprets and analyses available information about returning landscapes and water impacted by oil sands mining to a natural state and provides knowledge to those who can use it to drive breakthrough improvements in reclamation regulations and practices. OSRIN is a project of the University of Alberta's School of Energy and the Environment (SEE). OSRIN was launched with a start-up grant of \$4.5 million from Alberta Environment and a \$250,000 grant from the Canada School of Energy and Environment Ltd.

OSRIN provides:

- **Governments** with the independent, objective, credible information and analysis required to put appropriate regulatory and policy frameworks in place
- **Media, opinion leaders and the general public** with the facts about oil sands development, its environmental and social impacts, and landscape/water reclamation activities – so that public dialogue and policy is informed by solid evidence
- **Industry** with ready access to an integrated view of research that will help them make and execute reclamation plans – a view that crosses disciplines and organizational boundaries

OSRIN recognizes that much research has been done in these areas by a variety of players over 40 years of oil sands development. OSRIN synthesizes this collective knowledge and presents it in a form that allows others to use it to solve pressing problems. Where we identify knowledge gaps, we seek research partners to help fill them.

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REPORT SUMMARY

The Equivalent Land Capability Workshop, held on November 26, 2010 at the University of Alberta, provided an opportunity for 60 reclamation specialists to share views about Equivalent Land Capability and how it is applied to oil sands mine reclamation, and to identify research and information needs.

The purpose of the workshop was to develop a shared understanding of the concept and application of Equivalent Land Capability (ELC) as it applies to oil sands mine reclamation.

The workshop format was a series of presentations, each followed by group discussions, which were guided by a series of questions provided by the organizers. A final open forum plenary discussion asked what people had learned and what they felt the next steps should be.

There was general agreement that government should develop a policy document on what ELC means today, and acknowledge that the vision may change in the future. The policy document should acknowledge that ELC is much broader than the regulatory definition. ELC is a province-wide issue not just oil sands – therefore the oil sands could be a chapter in a bigger policy document. The policy should clearly distinguish the concept from the practice (implementation, measurement, etc.).

External discussion papers could be also commissioned, with representation from all the publics. The compilation of these papers can act as a pre-policy paper – a synthesis of opinions meant to inform policy. Contributors may need to be paid a stipend. It is not necessary to agree and there can be a diversity of opinions.

Additional recommendations that came out of the meeting are summarized below:

- Revisit 1998 End Land Use Committee Report.
- Re-institute the Development and Reclamation Review Committee as a tool to get better integration of government agency approaches and issues.
- Develop a vehicle for sharing information on ELC (e.g., an ELC Blog).
- Get more reclamation certificate applications in to test the system.
- Poll the public about reclamation expectations and land use options.

Additional ideas were submitted after the meeting:

- Develop a flow chart that shows and explains the different reclamation stages: Define end use goals; Establish baseline inventories and long term monitoring plots; Reclamation planning; Reclamation implementation; Reclamation monitoring; and, Certification assessment.
- Provide an example of an ELC through the various stages to show its change as it is proposed by a proponent after stakeholder involvement, negotiated, and then approved by government.

- Define what other measurement tools there are – indicating where they are appropriate would help.

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OSRIN thanks Mark Polet, Klohn Crippen Berger, for his work facilitating the workshop and drafting the final report. OSRIN also thanks Caroline Simpson, Annette Bussey and Jason House for their support during the workshop.

OSRIN also thanks Dr. David Chanasyk, University of Alberta, Department of Renewable Resources for his funding support for the workshop.

Lastly, we would like to thank the workshop participants and correspondents whose wisdom and input we have attempted to capture in is document.

1 INTRODUCTION

The Equivalent Land Capability Workshop, held on November 26, 2010 at the University of Alberta, provided an opportunity for 60 reclamation specialists to share views about Equivalent Land Capability and how it is applied to oil sands mine reclamation, and to identify research and information needs.

The purpose of the workshop was to develop a shared understanding of the concept and application of Equivalent Land Capability (ELC) as it applies to oil sands mine reclamation.

The workshop builds on preliminary discussions held in June 2010 as part of the broader OSRIN project *Challenges and Timelines in Reclamation and the Feasibility of Alternative End Land Uses* (Jones and Forrest 2010).

1.1 Report Structure

The workshop format was a series of presentations, each followed by group discussions, which were guided by a series of questions provided by the organizers (Sections 2 to 5 provide a summary of the key points of each presentation and discussion; collated notes from the flip charts at each table in each session are provided in the Appendices). A final open forum plenary discussion asked what people had learned and what they felt the next steps should be (Sections 6 and 7).

The organizers also solicited feedback before and after the Workshop and asked that each table identify a reviewer to ensure their comments were adequately reflected in the draft Workshop report. This feedback has been incorporated into this report and is noted as personal communications (pers. comm.) in the text.

This report summarizes the discussions following each of the presentations and includes:

- Workshop package ([Appendix 1](#))
- Presentations ([Appendix 2](#))
- New reclamation reporting definitions ([Appendix 3](#))
- Workshop notes ([Appendix 4](#))
- List of attendees ([Appendix 5](#))

1.2 Caveat

The following sections reflect the views of various participants and are not necessarily endorsed by OSRIN or all of the participants.

The report attempts to capture the range of views expressed by the participants. Some of the views are quite strong. The organizers acknowledged from the start that consensus views would be an ideal outcome but that the wide diversity of knowledge and opinions made that unlikely.

2 HISTORY AND INTENT OF EQUIVALENT LAND CAPABILITY

Chris Powter, Executive Director of the Oil Sands Research and Information Network, presented background information on the history and intent of Equivalent Land Capability (the presentation is in [Appendix 2](#)).

2.1 Presentation Summary

Equivalent Land Capability is defined in the *Conservation and Reclamation Regulation* (CRR – s. 1(e)) as:

(e) “equivalent land capability” means that the ability of the land to support various land uses after conservation and reclamation is similar to the ability that existed prior to an activity being conducted on the land, but that the individual land uses will not necessarily be identical;

Equivalent Land Capability is described in the CRR as an objective. Nowhere in the *Environmental Protection and Enhancement Act* (EPEA) or the CRR does it say that reclamation is required to meet any specific ELC. Project proponents are expected to identify what they believe to be “equivalent” through their proposed Conservation and Reclamation Plan and their Mine Closure Plan (i.e., it is incumbent on them to explain their choice in terms of land use, landscape, soil and vegetation). Regulators (Alberta Environment (AENV), Alberta Sustainable Resource Development (ASRD), and the Energy Resources Conservation Board (ERCB)) then work with the proponents and stakeholders to determine if this vision of ELC is appropriate for an individual mine and/or a region. Acceptance of the proposed plans and vision comes in the form of ERCB Decision Reports and various operating approvals. Given the long lifetime of an oil sands mine, the ELC vision may change over time as technologies and Best Management Practices evolve and public desires for end land use change.

Capability is almost always discussed in terms of a specific land use or function – i.e., *capability for what*. Often capability is identified for a primary use (e.g., forestry) with an expectation that other secondary uses will follow (e.g., wildlife habitat, recreation, traditional use).

Productivity used to be a regulatory goal but that goal shifted in the early 1980s to embrace the concept of capability (Alberta Land Conservation and Reclamation Council 1985). Productivity is dominantly an agricultural paradigm, though it is also important for commercial forestry. It is a less useful goal when evaluating wetlands or water bodies, and is particularly subject to manipulation (e.g., fertilization).

2.2 Discussion

The participants were asked to discuss the following questions:

- What does ELC mean to you?
- Is ELC an appropriate environmental management tool?
- Can you separate ELC and productivity?

- Can you separate ELC and function (land use)?
- Do you think we can measure ELC?

2.2.1 *What does ELC mean to you?*

The participants indicated that ELC is necessary as an objective to support the end land use. There are so many interpretations for the term ELC that it is best described in terms of the return of function after initial use of the land. Before defining the ELC, it is important to define the land use plan. ELC is a goal and planning tool at the start of a development, and a measurement tool at the end. Debate centered on the description of function:

- The healthy function of the (restored) soils should be considered first.
- The return of goods and services should be defined secondly in terms of function.
- Thirdly, function defined as a way to return the most impacted (compromised or limited) aspect of ecological services.

The definition of ELC needs refinement in the regulations. The definition of *function* remains a critical aspect of an effective use of ELC. The science needs to be separated from the regulatory paradigm. New definitions are required due to new knowledge. Specifically, it is unclear whether the ELC-based reclamation certification results in desirable vegetation succession pathways.

The value-based ELC system is both a blessing and a curse. The reasonableness and adaptability built into the ELC system is good because values change over time, but that same adaptability is confusing, and is therefore one of the reasons for this workshop. ELC depends on one's values, so how does one measure values? Human values relative to reclamation goals (landscapes, land uses) are always changing. If all stakeholders are willing to change the outcome (they all want the same thing) then it should be allowed to happen.

More planning is required to maximize future uses, including incorporating human values as well as ecological ones. For instance, the ELC could be a shopping centre. The end land use drives reclamation, depending on reasonableness and values. A process is required to determine the agreed upon end land use.

The public perceives ELC as restoration ([Appendix 1](#)). What society wants, however, and is willing to accept, is critical. From a societal perspective ELC means acceptable land use(s).

One of the key paradigms to explore is whether capability implies sustainability. Can ELC be replaced with a sustainability (or triple bottom line) index that incorporates social and economic as well as traditional reclamation (environmental) expectations? The application of the social sciences to ELC was an interesting idea. The importance of social licence was also mentioned.

Oil sands does not have a solid basis for measuring ELC, but it should include soil, vegetation and water criteria indicators. The reclamation timeframe for the boreal forest (15 years) is quite different compared with 3 years for agricultural lands. This time gap between cessation of

disturbance and a functional ELC is critical. For boreal forest, forest productivity is central (while there has been considerable work done by CEMA on tree species standards there has not been a similar level of work on understory species (Vinge, pers. comm.)).

In summary, the definition of ELC needs clarification. We need tools to measure it. We need a process to involve the public in end land use selection.

2.2.2 *Is ELC an appropriate environmental management tool?*

The opinions on this question were quite diverse.

Some participants said ‘yes’, because the definition is flexible, it is a ‘start’, and in its absence, industry would do nothing. If it is not flexible enough, then it cannot accommodate the values of the day; this is important because there is a lag between when rules are written, and their implementation. Others said ‘yes’, but only if a definition has to be agreed upon by all stakeholders. There may need to be some minimum requirements established – e.g., the area has to contribute clean water and air through healthy vegetation (Vinge, pers. comm.).

Others said no, the definition is meaningless, vague, too flexible and too broad to be an effective tool. In the absence of ELC, legislation still requires reclamation. Others claim that ELC focuses on use, not environmental values.

The word *land* muddles the issue as it seems to ignore water-based reclamation¹, (i.e., Equivalent Land Capability vs. Equivalent Capability) – this problem is magnified by the focus of existing measurement tools such as the Land Capability Classification System (LCCS) which ranks wetlands as *low capability*. One group suggested *Acceptable Land Capability* instead of Equivalent Land Capability. A broader systems approach is suggested, which should include an ecosystem view including water bodies, wetlands, and terrestrial systems. Others argued that ‘rehabilitation’ should replace ‘reclamation’.

If ELC is an objective, can it also be a tool? If it can be a tool, should it be used for planning purposes or for reclamation certification purposes (or both)? While ELC is an appropriate objective, the supporting measurement tools are considered inadequate (e.g., LCCS) or missing entirely (e.g., wildlife habitat, recreation, wetlands, lakes). Measurable tools need to be developed for ELC so they can give practitioners an idea of what to strive for.

The concept of ELC should be reviewed and updated every five years. Approval requirements should also be adaptable, though the renewal process accommodated some adaptability that way.

2.2.3 *Can you separate ELC and productivity?*

Participants generally said that ELC and productivity are closely and theoretically linked, that ELC means a potential productivity, and that it is different for different land uses. ELC gives a better understanding of land use. Productivity can be used as a measure to confirm ELC has

¹ Note however that the CRR (s. 1(j)) defines land as terrestrial, semi-aquatic and aquatic landscapes when the term is used in the definitions of “land capability” and “equivalent land capability”.

been met but caution is required not to measure productivity at the expense of ecosystem function (e.g., fertilized forests are productive but perhaps not sustainable).

Does a productive forest mean sustainability? For how long do we measure productivity in terms of a forest system? How long should artificial inputs (e.g., fertilizer) be allowed to skew productivity measurement? What is the appropriate scale for productivity measurement? Productivity is just not wood or agricultural, but it can also encompass carbon and habitat for instance. Can you measure productivity on a wetland? Black spruce, for instance, is only unproductive in timber values, but productive in other perspectives.

2.2.4 *Can you separate ELC and function (land use)?*

Participants agreed you cannot separate function (land use) and ELC. If one chooses a land use, the functions follow. Land use function is defined by the ELC selected.

2.2.5 *Do you think we can measure ELC?*

This discussion brought up two key issues. Firstly, *we* needs to be defined in terms of who selects ELC goals – does *we* include regulators, scientists, industry, public and other stakeholders? Once the goal is identified, then we can decide if and how we can measure ELC. The participants indicated current tools to measure ELC are inadequate, or that ELC can't be measured. It's an objective determined through other measures. Weight of evidence needs to be compiled to prove you've done something towards achieving ELC. One could also take an economic view (\$/ha) to measure ELC.

For oil sands development to proceed responsibly on public land, it should occur within science-based thresholds for land, air and water. Governments need to ensure that reclamation is occurring so that land disturbance isn't exceeding capacity of native flora and fauna to adapt to the change (Grant, pers. comm.). A process and tool to measure ELC is needed. Productivity can be separated from capability but productivity will still be used as a measure. It is likely easier to agree on performance if we measure over a larger scale (e.g., region) than on a landform basis.

3 APPLICATION TO MINING

Cam Bateman, Vice-President – Projects, SilverBirch Energy provided some historical and current context for how Equivalent Land Capability is applied to coal and oil sands mines (the presentation is in [Appendix 2](#)).

3.1 Presentation Summary

The practice and now routine application of reclamation certification in coal mines can be a goal to which oil sands can aspire. The complexity of interagency expectations between AENV, ASRD and ERCB in the oil sands region is not found on prairie coal mines, though similar challenges are faced on mountain coal mines.

Permanent sample plots, soil studies, the ongoing inventory of land capability classification and agricultural use of reclaimed land by prospective landowners led to successful coal mine reclamation and certification.

Agreement on the quality of reclaimed land with the next land tenant is mandatory. Based on coal experience, debate was seen as leading to consensus, and patience and persistence was counseled.

3.2 Discussion

The participants were asked to discuss the following questions:

- Does the concept of ELC change with the sector or just the expectations and measurement tools?
- What is the “right” scale for ELC assessment – region, mine site, landform?
- What role does industry play in determining ELC for a site?
- What can we learn from coal?

3.2.1 *Does the concept of ELC change with the sector or just the expectations and measurement tools?*

Some participants agreed that the concepts and expectations do change with sector. Some argue that there are different expectations in coal versus oil sands, and within coal between plains and mountains/foothills). Complexity of the reclamation process, perspectives of reclamation, and expectations from reclamation change with time and knowledge. Government and regulatory players are different. Public scrutiny is different as well, from local views (plains coal) to global views (oil sands). Social expectations often drive the application of ELC.

Expectations do change with sector. For instance if one is reclaiming to a forest, multiple uses and the stakeholders using the forest need to be accommodated. If it is agricultural land, the number of stakeholders, such as agricultural producers and perhaps hunters or users of wetlands, is more limited. Measurement tools are different, and the concept of ELC changes with the land use decisions made. Experience also plays a role. Prairie coal reclamation has a body of experience behind it; oil sands reclamation is still in its infancy. Oil sands reclamation is much more complex, and confusing, because of the different regulators and different goals. To clarify, the establishment of end land use goals is the “negotiated” point where public input happens. Coal mines and even privately held contaminated sites have an easier time, or at least a less confusing regulatory structure, when they purchase the land and then sell it back.

A separate argument was that public land should be held to different standards than private land. These standards ultimately depend on public opinion through their government representatives who write the legislation. Thus industry can have some input on what ELC is, but it should be the government that leads the process (House, pers. comm.).

The concept of ELC is the same, but the tools and approaches change, as do the decisions made. One important component is that oil sands are primarily on public lands; everyone has a say or interest in the land. Oil sands activities are also clumped, with a larger scale of disturbance.

The concept or central tenet of ELC should not be restricted to oil sands or a specific industry. ELC should be broadly applied and recognized across all specified land situations/industries. However, a number of gaps in terms of policy/guidance and most certainly in terms of the reclamation criteria assessment exist for coal, and professional judgment is what we have to rely upon in these areas (Puhlmann, pers. comm.). Professional judgement needs to be backed up by data and be applied at an early enough stage in the reclamation process to be able to initiate corrective action if required (Vinge, pers. comm.).

The processes or tools used by the coal industry and specifically the reclamation certification process are somewhat different for plains coal mines and foothills/mountain coal mines.

3.2.2 What is the “right” scale for ELC assessment – region, mine site, landform?

There appears to be consensus that all three scales are important and need to be integrated. One has to look across the scales to focus on the landform. The only way to manage cumulative impacts and a multitude of individual developers is through a regional approach, and stakeholders should set vision and goals for the region. The landform is the building block for ELC. Those goals can then be scaled to achievable results for each project. There is a call for one overall regulator to define regional goals.

Cumulative Effects Management (CEM) can provide a different perspective and an effective way to manage for ELC, the desired outcome for specified land. ELC should be discussed in relation of other CEM components. CEM provides the way to complete the cycle of setting the desired outcome (ELC), describing policy, assembling information, identifying indicators and thresholds, monitoring for thresholds, validating information, reporting, adjusting and eventually assuring the desired outcome.

3.2.3 What role does industry play in determining ELC for a site?

Industry has a key technical role in determining ELC for the site; industry is responsible before, during, and after mining. Industry does not set the rules for the ELC. The regulator defines the goal based on policy and input from stakeholders, acceptable outcomes, and the targets for equivalent land capability after reclamation. Government must set clearer goals for the oil sands. Both industry and government must lead innovation in the reclamation area.

Industry has accountability in reclamation, but they need to help government develop guidelines. They need to work together proactively to balance accountability. There has been rapid oil sands development; government is trying to catch up and get policy to follow, and hoping to get correlation in guidelines with ASRD and AENV.

Industry has a role in providing information as to what is physically possible, and what adaptations need to be made. But once rules are established, industry complies. Industry provides technical, site-specific data, rationale, pre-disturbance land capability, and long term

monitoring. Industry proposes an end land use to government and stakeholders based on current values, economics and technical capability, and consults with those parties on end land use and function. If there is no agreement, the project does not proceed. Industry also has an obligation to monitor reclamation success.

This question brought out a lot of discussion about the potential of ELC. The government must remain rigid in its requirements, but allow industry flexibility in the application of methods. With stringent requirements up front, and clearly defined outcomes, there is a chance for innovation and adaptation in the methods getting to that outcome; for example, D074 (ERCB) provides a stimulus for tailings innovation.

3.2.4 *What can we learn from coal?*

Several lessons can be learned from coal. Some noted that a mine is a mine, and oil sands operators must think like miners, not like oilfield operators, to be successful.

There is a deep understanding of the pre-disturbance landscape in coal. Environmental planning has been integrated into mine planning. Coal companies have worked diligently with stakeholders to achieve a level of social acceptability, and have achieved a culture change in the public who are now more positively disposed to mining given reclamation successes. The principle of progressive reclamation, the integration of primary and secondary land use, the economic value of the final land use, and the integration of environmental planning into mine planning were lauded. Persistence in applying sound reclamation principles has paid off. Success is as simple as following your approvals.

The advantage of having one regulator and a simplified, clear, regulatory approach on private land coal mines was clear. The coordination between regulators and industry in the coal area was lauded. Clear approvals that were followed by the industry were acknowledged as well. The legislation provided clear impetus for research and application of reclamation principles in the coal industry. Applied research is paramount.

While some argued that oil sands reclamation is a more complex problem with more challenges in defining final land uses and ELCs, others argued that grasses are just as complex as trees. Oil sands are very different from (plains) coal; particularly in terms of the response of vegetation to reclaimed conditions (different vegetation types, different management opportunities and time to show “proof” of performance). On the other hand, foothills mines are as equally complex as oil sands mines in terms of topography, final landform and land uses.

4 PUBLIC PERCEPTIONS

Justin Straker, a consultant with Integral Ecology Group and, for the purposes of this presentation a *member of the public*, provided some insights into how the public, and especially First Nations in the Fort McMurray region, view Equivalent Land Capability (the presentation is in [Appendix 2](#)).

4.1 Presentation Summary

The public can be divided into those who are uninformed, moderately informed or hyper-informed (experts). For both the uninformed and moderately informed publics what they should expect and what they do expect from reclamation and ELC are the same. A 2007 Probe Research survey for the Pembina Institute found that 88% of Albertans felt that new oil sands mines should only be approved if companies can demonstrate that they can return mined areas to the way they were before mining began. On the other hand, the hyper-informed public acknowledges tacitly that ELC is an objective, but use it in public forums as a lever to achieve different purposes.

An analogy between industrial use of land and renting property was drawn to provide another way to think of how the public views Equivalent Land Capability discussions.

There are three key challenges for ELC:

- *Potential disconnect between policy/expectations and reality* – ELC can perpetuate false expectations, or a disconnect between what “the public” might expect and what “we” might be able to deliver.
- *Difficulties in defining, assessing, and documenting achievement of ELC* – is ELC similar functions, different but agreed to functions or whatever the certification criteria are?
- *The “hubris” of future land-use selection* – selecting one use, or a future use and who gets to decide are problems.

What is required is a careful articulation of ELC meaning and process, and an effort to match public expectation to our ability to deliver.

4.2 Discussion

The participants were asked to discuss the following questions:

- Who is “the public”?
- What role should the public play in ELC and when should they be involved?
- Is ELC for public land “different”?
- Are there public expectations that are outside ELC and if so, how do we incorporate them into the regulatory decision process (are they in addition to, or in place of ELC)?

4.2.1 Who is “the public”?

The conversation was wide ranging. A number of different *public groups* were defined. The public is considered *everybody* because development and reclamation benefits everyone and most of the development is on public land. The local level should have a priority. First Nations rights should be acknowledged and they should be directly involved in ELC.

The public was first defined geographically:

- Local;
- Provincial;
- National;
- International; and
- World.

The Public was also broken down functionally:

- Press;
- Customers of oil;
- Those legislatively authorized to have input; and
- Those with associated interests on a given issue.

Two types of public are exposed to the project's benefits and impacts:

- Directly affected
 - People in Fort McMurray
 - Aboriginal Groups
 - Other land users
- Indirectly affected

There are also different levels of informed public (expanded from Justin's list); this list does not include the media:

- Not informed;
- Mal-informed;
- Informed; and
- Hyper-informed.

A concern was raised that the general public's understanding of oil sands reclamation and end land use options is low; therefore, there is a disconnect with their expectations. One must ensure stakeholders are adequately informed so that their input is valuable. The age of (internet) information has drastically changed who is aware of oil sands and individual projects, and what they *know* about it.

The role of the media was discussed. Media is a voice for the public, both good and bad. The media carries and amplifies public opinion. The risk with the media is passing on misinformation; therefore, one needs to be careful of sources used to poll public opinion.

In terms of participation, there are:

- The seen and heard (minority).
- The unseen and not heard, not vocal (majority).

One can learn from the forest industry that it is important to demonstrate to the public that they are being listened to through meaningful consultation and that their considerations are taken into account when making decisions. The public taught the forest industry that the forest is about more than just timber values.

4.2.2 What role should the public play in ELC and when should they be involved?

The roles and avenues for public participation are many and varied. The roles include influencing legislation, input into policy setting, participating in drafting regulations, comments on approvals (if directly affected by a particular project), and through consumer choices. It is imperative that all voices be heard, though not all will be happy with the decision.

Their views can and should be expressed through the media, their votes, the Lower Athabasca Regional Plan, their elected officials, and as investors or shareholders.

The public should be involved in the approval process, helping to define the outcomes. Many argued the public should be involved in the whole process, from feasibility to closure, from the beginning of ELC definition to the final expression of ELC, though some argued the public should be involved in setting targets and goals, but not in planning specific end land uses on a small scale. At the very least, the public should have a transparent view of the process, if not oversight of its outcomes.

End land use changes should be driven, but not solely determined, by the local population. Taxpayers should have a higher authority than non-voters. While the public has a voice, they have no veto. The public has a role to define the values that guide reclamation end points. Input into closure plans could be through the representatives of the people (i.e., AENV/ASRD) or through direct users of land. At the very least, the public should hold the government and industry accountable. The government is perceived to be representative of the public and should ensure end land use decisions are economically viable.

The response to individual public groups should not be based on the stridency of their voice, as extreme opinions are not normally held by the moderate majority. One group indicated the directly affected public should face the same scrutiny in their use of the land. The public is everyone, but stakeholders must meet a test of interest. One must confirm what the stakeholders need/want – don't make assumptions (e.g., First Nations may want roads left in place so don't assume roads have to be removed).

4.2.3 Is ELC for public land “different”?

While one might assume the approach to public land would be the same it may not be. Expectations are different in the public; they subscribe to different reclamation standards. The public's values are complex and different values and end land uses need to be considered. While

the private landowner has more of a say in a specific ELC affecting their land, expectations are high to take care of Alberta's public land and there should be the same level of vigilance on public land as there is by the landowner on private land.

Others argued that the approach to ELC on public land is pretty much the same; ELC should not be different. End land use decisions may be different. There may be a distinction between disturbed and undisturbed land, regardless of ownership.

There is no clear value system for public land. There should be equivalent transparency to public land use as there is to municipal zoning. It was argued there was distrust between government members and the public, and that stakeholders rights should be defined. Clarity is also required in certification and liability.

Ecological integrity needs a land base that functions, regardless of private/public boundaries.

4.2.4 *Are there public expectations that are outside ELC and if so, how do we incorporate them into the regulatory decision process (are they in addition to, or in place of ELC)?*

The public has a very high expectation, too many options, and desires for each hectare of land. This heightened expectation is partly the fault of industry, regulators, and commitments made in EIAs and other documents. In addition to these positive expectations, others of the public feel multinational industries come just to make money from the oil sands.

Regardless, it is imperative to keep the public informed and engaged. Industry wants political stability and to understand the expectations.

The public expectation appears to be restoration. The government must accept responsibility for clarifying roles and responsibilities and for conducting adequate monitoring/investigation of sites to instill public confidence (Vinge, pers. comm.). The government needs to explain how they are looking after the public's interest, and explain to the public the consequences of reclamation. There is a need to move the *uninformed public* to other categories through more and better information, but recognition that they may not be interested. There is a need to create a better understanding of the basics of reclamation and ELC.

5 REGULATORY PROCESS

Tanya Richens, Regulatory Approvals Coordinator with Alberta Environment, provided an overview of how Equivalent Land Capability is used within the regulatory system (the presentation is in [Appendix 2](#)).

5.1 Presentation Summary

Tanya referred the audience to some of the base documents (Alberta Environment 1998a,b) that defined the approach to oil sands reclamation. The priority will be reclamation to Natural and Conservation Areas and Commercial Forests. These areas should be re-established as early as possible, as productive natural ecosystems. This is for the purpose of meeting predisturbance productivity commitments for pre-existing land uses. There will also be significant flexibility for

human development types of end land uses on the remaining areas. The group was also referred to Alberta Environment (2010) where an oil sands reclamation indicator shows the extent of the active area – including forest clearing, site preparation, mining, plant sites, tailing ponds, and roads – and the area reclaimed for oil sands mines from 1987 to the end of 2008. New definitions for reclamation tracking were developed to provide the public with better context for the amount of land disturbed, reclaimed and certified ([Appendix 3](#)).

There is an iterative process moving from application to approval to implementation to certification. It is important to acknowledge we don't know everything at the application stage. Uncertainty exists on the certification process for oil sands. It was also noted that prescriptive approval requirements also pose a problem – who has the ultimate liability when prescriptive clauses fail?

Certification and ELC are linked – certification criteria should be a validation of ELC, which should be a prediction of performance (successional) trajectory. In spite of this linkage, one could meet ELC but miss a criterion; ELC may therefore be less onerous than criteria and one should make sure the certification process has common-sense built into it.

Regulators have ultimate accountability and therefore need to take on a greater role in reclamation and land use planning. A key role is for the regulators to establish guidelines and criteria. A common understanding of rules and expectations between government agencies is required. Industry wants government input, not direction with industry input. Industry and government need to work together in organizations such as CEMA. Yet industry is the driver starting with EIA, through approval, development and reclamation. Industry needs to help government succeed.

Industry needs social licence from stakeholders, and may require a culture change in terms of working with stakeholders. Stakeholders have an important role but they need more guidance on how to carry out that role. Social expectations drive end land use decisions and therefore ELC. A process for developing and documenting agreement on ELC is required. Regulations squash adaptive management unless regulations are also being adaptively managed.

5.2 Discussion

The participants were asked to discuss the following questions:

- How should ERCB Decision Reports, approvals and policy direct the selection and implementation of ELC?
- When should we measure achievement of ELC?
- What is the relationship between ELC and certification criteria?

5.2.1 How should ERCB Decision Reports, approvals and policy direct the selection and implementation of ELC?

The ERCB decision report² and subsequent approval are really an agreement of what to do, a rental agreement (to use Justin's analogy). The issue is some of the clauses in the ERCB approval are too generic to cover ELC criteria (in part because achieving ELC is not the ERCB's core responsibility). At the same time, the ERCB should insist the EIAs measure a stronger historical baseline, which would assist greatly in the subsequent development of ELC. The details for ELC are not known at this early approval stage. However, even at this stage, the decision should reflect the Government of Alberta policy. The government should provide policy clarification for the project for the ERCB on ELC. The regulatory responsibilities of the ERCB might conflict with subsequent approvals and guidelines. The AENV/ASRD supplemental data request allows some iteration in the process, and AENV/ASRD needs to be aligned on the process. The terms of reference for the EIA should include an expanded definition of ELC.

The ERCB has jurisdiction over tailings ponds and overburden dumps, while AENV/ASRD has jurisdiction over ELC. How tailings ponds and dumps are constructed and their location critically influences the final options for ELC.

In summary, good communication between the regulators is required³. There is no common understanding of what needs to be achieved; with each department working in exclusion of others⁴. With increasing federal oversight of the oil sands, it is critical Environment Canada cooperates with its co-regulators. Co-regulators need to be each other's *stakeholders*, therefore engendering a higher level of communication.

5.2.2 When should we measure achievement of ELC?

Consistently the group saw the measurement of ELC as an iterative process, started as early as possible with certification at the end. Measurements should be carried out all the way along, with benchmarking on the way. This will allow for continuous improvement. Because the process of reclamation is iterative, the key is to monitor often to define progress along the reclamation trajectory and intervene as necessary. This is especially true with tailings ponds, where there is no real reclamation history yet. The development of long term information is critical.

² See <http://www.osrin.ualberta.ca/Resources/WebsiteLinks/ERCBDecisionReports.aspx> for recent ERCB mineable oil sands Decision Reports

³ This may be accomplished in part by the proposed single regulator system (<http://www.energy.alberta.ca/Initiatives/RegulatoryEnhancement.asp>).

⁴ Government has many roles in this process: (1) Ensure that the plans are reasonable and attainable; (2) Ensure that the plans are delivered as promised; and (3) Ensure that the result is sustainable and that a reasonable number of ecological process are functioning correctly (Vinge, pers. comm.).

Others saw milestones, stages, or iterative steps being used and measured: after soil salvage, soil placement or revegetation, for instance. Soil replacement and revegetation are more important than soil salvage as a milestone. Milestones can also be set on a time-based cycle (e.g., every five years), or via different measurements, such as natural/harvest data, reclamation trials, and historical time for each reclamation site for each type (upland, wetland). ELC should be measured in iterative steps as well.

The best time to measure milestones is when you can make an effective intervention to fix the problem. The reclamation certificate is the final and formal signoff.

5.2.3 What is the relationship between ELC and certification criteria?

ELC and certification criteria are intimately tied together; certification is a reflection of ELC. Some argued that satisfying reclamation criteria satisfies ELC. ELC should be defined and then achievement should be measured all along the way. There should be aggressive benchmarks to meet along the way. Certification should occur at the end after meeting those benchmarks. The certification criteria should be the validation of meeting ELC, but one could meet ELC without meeting certification criteria. Meeting ELC criteria could be easier than meeting other established criteria, like productivity.

The goal posts for Equivalent Land Capacity and reclamation criteria are never defined; they change over time as values change. Reclamation criteria need more focus on science-based criteria (ecological processes) to set ecosystem capacities. One of the gaps is the lack of aquatic capability classes, and wetland function.

We should use a prescription / contract for the end state. It is a question of liability – who is on the hook when the prescription fails? If a clause does fail, there should be an adaptive management loop to ensure the ineffective practices are no longer in use (Vinge, pers. comm.).

Reclamation is different in the oil sands than in coal because the former is a large scale disturbance on the landscape level. Productivity is more about certainty of plant response to soil conditions and it might take 20 to 30 years to prove in forested ecosystems. Remember, only one site has been certified – Syncrude's Gateway Hill (S4 dump).

If we want an informed public, we must move them from uninformed to informed. How can this be done to elevate discussion on expectations? At a minimum, there needs to be more effort to engage them as the forest industry eventually did when confronted with similar public concerns. Maybe the government needs a document laying out what ELC means. We need to understand and agree on this because it is the foundation of reclamation.

6 OPEN DISCUSSION

The following questions were posed to the whole group of participants to stimulate the discussion:

- Now what does ELC mean to you?
- Can we (should we) measure ELC? If so, when?

- What should we do next?

The participants added another question – What are the roles of AENV/ASRD/ERCB?

6.1 Now what does ELC mean to you?

We shouldn't re-invent the wheel for oil sands. ELC needs to be consistent across the province. We will work to make ELC sustainable in the oil sands. There is a lot of work to do, but coal reclamation showed us it is possible. The approval is a contract and the company's responsibility is to meet the terms of the contract.

The Alberta public appears to have much higher expectations for oil sands reclamation than is being delivered in the Athabasca Boreal region. The public is translating reclamation to restoration. We need to explain the reality of reclamation and manage expectations. It is not possible to put it back the way it was (even with natural disturbances, the forest outcome is different) but it should be possible to kick-start the ecological succession processes by creating the appropriate landscape and soil conditions and planting appropriate starter vegetation. Industry advertisements using the term *restoration* instead of *reclamation* are a problem when we are trying to communicate expectations.

In a telephone opinion survey of 500 Albertans, conducted by Probe Research in April 2007, 88% of Albertans felt that new oil sands mines should only be approved if companies can demonstrate that they can return mined areas to the way they were before mining began. In January 2008, a survey of 1,303 Albertans rated the pace of reclamation as one of the top three value drivers important to Albertans' outlook on oil sands development. Similar findings were reported in the 2009 survey (Chapman and Das 2010). We need to know regional expectations in the Lower Athabasca Regional Plan⁵ so government can put them into day to day regulatory processes.

Given public confusion around reclamation and its end goals, there is an opportunity to clarify and renew the objective of ELC and the tools used to advance it. The public can assist in determining what the end uses are, and the process by which the public are engaged can serve as an opportunity to inform them as to what reclamation under EPEA actually means (Grant, pers. comm.). We should gather information from local stakeholders to see what is of value to them, but will need to exercise caution in ensuring their desires are defined with an awareness of the regional ecological and land management context.

ELC is a tool to focus reclamation objectives. ELC is different from capability assessment for a specific use (i.e., difference between a concept and a measure), and a professional judgment issue. ELC is about *potential* not *performance* or *proof*. The desire for a flexible system, open

⁵ See Draft Regional Plan (April 2011) at http://landuse.alberta.ca/RegionalPlans/LowerAthabasca/documents/DLARP%20Regional%20Plan_FINAL_March%2029%202011_1%2044%20pm.pdf

for interpretation and judgment, makes measurement much more difficult. We may be able to clarify what ELC is by confirming what it isn't.

It may be better to talk about “functions” instead of landuse; if function is in place the individual species could be different (e.g., as long as a forest can grow do we really care if it is a spruce or aspen or pine forest). Is this system functioning similar to before? What are the most important processes going on in the forest and what do we want to maintain? We need to get past land uses and focus on something that is sustainable. Will similar forests develop on similar sites? To expect the same forest to come back after natural disturbance is unrealistic. So ELC in the oil sands will be different ecologically too. One needs to broaden landscape to include fens, bogs, wildlife into the capability system.

Future land use needs to be determined before you define ELC⁶. ELC is a values decision – use is something we agree on based on an understanding of basic building blocks (e.g., soil and landscape). One needs a mechanism to figure out ELC based on today's values but update expectations as values change. We need a system in place to allow for broad input into this decision. Note that the End Land Use Committee report (Alberta Environment 1998a) has some very valuable information in it and people should read it.

The argument needs to be framed in a cost-benefit terms. ELC may be a good example of the triple-bottom-line method – need a ledger of costs and benefits to help make and explain decisions. A Wal-Mart parking lot can be an ELC if we balance social and economic needs with environmental needs. It should be possible to create a system that acknowledges these three goals; all of which are required in some proportion. We need to know what impacts LARP will have on reclamation, especially end land use options/expectations.

Perhaps the label *Equivalent Land Capability* is a problem that diverts attention; on the other hand if we don't use ELC we will still have to have a goal or target and give it a “name” and then we will have to define “name”.

6.2 Can we (should we) measure ELC? If so, when?

ELC can be measured fairly early, but repeated measurement over time is needed.

Measurement depends on what's in your approval. It is difficult to know what and how to measure something when you can't define ELC (there is a chicken-and-egg problem here – setting clear targets gives you something to measure but the targets are defined in part by what we can measure). Functionality can't be measured confidently. We just have to go and try the best we can and collaborate with stakeholders.

⁶ In forestry we use a future forest concept. We take all of the public inputs in terms of their values, we consider all of the constraints that we have to face and we project a future forest landscape that meets ecological, economic and social needs. This is achieved by using a strong public advisory role in setting the objectives for the future forest. I think this future forest planning concept would be useful to consider for reclamation planning for the mines (Vinge, pers. comm.).

The flexibility of ELC is useful but confusing. How should we interpret it today? And how should we mold it as ideas and values change?

ELC means a productive potential and that is all. Is ELC a value choice? Is it a question of whether you have built the original blocks and then constituents decide what to do with it?

LCCS for forest productivity isn't needed, it is out dated.

To move forward we need to:

- Develop and communicate the ELC assessment system (or the individual assessment systems that make up the *whole*)
- Better define “success” for alternative reclamation schemes (e.g., what is success for Base Mine Lake (water-capped fine tailings) – this is needed quickly because it will help determine what needs to be monitored)
- Put in reclamation certificate applications to test the system
- Get proof of “success” to give people comfort that oil sands can be reclaimed
- Move ELC system into oil sands, building on previous coal experience
- Develop a capability system for wetlands and all the functions they support (the system should also address water quality)
- Identify the key steps in the development and reclamation process and show where land/mines are at and what progress is being made
- Determine how achievement of these milestones should be recognized (industry has raised the concept of a formal *signoff* at each milestone, with the intent that the operator would not have to do any further work on that milestone task – Puhlmann, pers. comm.)
- Communicate success – this isn't a task just for the regulators, it requires a joint effort

6.3 What are the roles of AENV/ASRD/ERCB?

Discussions focused on the roles of ASRD and AENV. Participations questioned the role of the ERCB in determining ELC.

Currently, there is a disconnect between governments, and between departments within governments. They interpret regulations differently and use different criteria. This makes it difficult for industry to know what to do⁷. From a regulatory standpoint, government needs to re-institute the old Development and Reclamation Review Committee. The Development and Reclamation Review Committee consisted of the key provincial departments and was chaired by

⁷ To be fair, the overall interaction process would also be helped by a common and consistent industry approach, both at the sector-level and within company “silos”.

AENV. It functioned at the EIA and approval stage as a forum for developing a clear and unified government decision. It provided a forum for industry to bring forward projects and get a clear sense of specific issues they may face. It also provided a forum for discussion and debate, in the boardroom and in the field, about specific regulatory interpretation issues.

Through some recent approval renewals, regulatory staff have undertaken to improve and harmonize policy and conditions to improve soil salvage, and reclamation practices at the mines, consistent with rest of the province. While the approvals provide some form of guidance in terms of reclamation expectations, they fail to address assessment, capability or specific criteria that align with the reclamation certification process⁸. We should put together approvals with broader language to provide more flexibility in reclamation; some are quite broad and others are very detailed.

Issues that need to be addressed include end land use expectations (forestry/wildlife values) and watershed expectations (quality – selenium (coal), naphthenic acids (oil sands), and sedimentation). As we are guided predominantly by a traditional reclamation focus (i.e., land and soils focus) the end land uses involving wildlife require greater planning and consideration in terms of design, planning and features that support a variety of species and distribution patterns. Opportunistically, this may be viewed as a chance to test or develop reclamation metrics and therefore criteria, that validate the success of reclamation in support of wildlife, as opposed to relying on the traditional premise of "build it and they will come" as is often asserted.

The process of transition of responsibilities from the mine operator to government after certification needs to be documented. It is the view and expectation of ASRD that lands will be returned to the public, such that they are immediately useable and not retained by the approval holder/operator as this prevents public use in most circumstances (i.e., MSL still in place preventing public access) (Puhlmann, pers. comm.).

7 WHAT SHOULD WE DO NEXT?

There was general agreement that government should develop a policy document on what ELC means today, and acknowledge that the vision may change in the future. The policy document should acknowledge that ELC is much broader than the regulatory definition. ELC is a province-wide issue not just oil sands – therefore the oil sands could be a chapter in a bigger policy document. The policy should clearly distinguish the concept from the practice (implementation, measurement, etc.).

External discussion papers could be also commissioned, with representation from all the publics. The compilation of these papers can act as a pre-policy paper – a synthesis of opinions meant to

⁸ See *Guidelines for Reclamation to Forest Vegetation in the Athabasca Oil Sands Region* (<http://environment.gov.ab.ca/info/library/8269.pdf>) as a good example of merging expectations and measurement systems. CEMA is also finalizing the *Alberta Regeneration Standards for Mineable Oil Sands*. These documents are a good place to start the dialogue.

inform policy. Contributors may need to be paid a stipend. It is not necessary to agree and there can be a diversity of opinions.

Additional recommendations that came out of the meeting are summarized below:

- Revisit 1998 End Land Use Committee Report.
- Re-institute the Development and Reclamation Review Committee as a tool to get better integration of government agency approaches and issues.
- Develop a vehicle for sharing information on ELC (e.g., an ELC Blog).
- Get more reclamation certificate applications in to test the system.
- Poll the public about reclamation expectations and land use options.

Additional ideas were submitted after the meeting (Bessie pers. comm.):

- Develop a flow chart that shows and explains the different reclamation stages: Define end use goals; Establish baseline inventories and long term monitoring plots; Reclamation planning; Reclamation implementation; Reclamation monitoring; and, Certification assessment.
- Provide an example of an ELC through the various stages to show its change as it is proposed by a proponent after stakeholder involvement, negotiated, and then approved by government.
- Define what other measurement tools there are – indicating where they are appropriate would help.

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9 GLOSSARY OF TERMS AND ACRONYMS IN THIS REPORT

9.1 Terms

Equivalent Land Capability

The ability of the land to support various land uses after conservation and reclamation is similar to the ability that existed prior to an activity being conducted on the land, but that the individual land uses will not necessarily be identical ([Conservation and Reclamation Regulation](#) s. 1(e)).

9.2 Acronyms

AENV	Alberta Environment
ASRD	Alberta Sustainable Resources Development
EC	Electrical Conductivity
ELU	End Land Use
ELUC	End Land Use Committee
FMA	Forest Management Agreement
GOA	Government of Alberta
LCCS	Land Capability Classification System
MSL	Miscellaneous Surface Lease
OSRIN	Oil Sands Research and Information Network
PDA	Pre-disturbance assessment
SEE	School of Energy and the Environment

APPENDIX 1: Workshop Workbook

The following materials were sent out to Workshop participants as background material.

OSRIN Equivalent Land Capability Workshop Information Package

November 26, 2010

0930 to 1530

Wildrose Room, Lister Hall

University of Alberta

87 Ave and 116 Street, Edmonton

Workshop Purpose and Agenda

Purpose of the Workshop

To develop a shared understanding of the concept and application of Equivalent Land Capability as it applies to oil sands mine reclamation.

The workshop will build on preliminary discussions held in June 2010 as part of the broader OSRIN project *Challenges and Timelines in Reclamation and the Feasibility of Alternative End Land Uses*.

Format

The workshop format will consist of a presentation and then discussion of the theme. At the end of the workshop we will have an open session to allow for discussion on Equivalent Land Capability.

Agenda

0930	Welcome and Introductions • Report Steering Committee	Chris Powter and David Chanasyk
1000	History and Intent of Equivalent Land Capability Session Questions: • What does ELC mean to you? • Is ELC an appropriate environmental management tool? • Can you separate ELC and productivity? • Can you separate ELC and function (land use)? • Do you think we can measure ELC?	Chris Powter
1100	Application to the Mining Sector	Cam Bateman

Session Questions:

- Does the concept of ELC change with the sector or just the expectations and measurement tools?
- What is the “right” scale for ELC assessment – region, mine site, landform?
- What role does industry play in determining ELC for a site?
- What can we learn from coal?

1200 Lunch (provided on site)

1230 Public Expectations Justin Straker

Session Questions:

- Who is “the public”?
- What role should the public play in ELC and when should they be involved?
- Is ELC for public land “different”?
- Are there public expectations that are outside ELC and if so, how do we incorporate them into the regulatory decision process (are they in addition to, or in place of ELC)?

1330 Regulatory Process (Act > Approval > Practice) Tanya Richens

Session Questions:

- How should ERCB Decision Reports, approvals and policy direct the selection and implementation of ELC?
- When should we measure achievement of ELC?
- What is the relationship between ELC and certification criteria?

1430 Open Discussion All

- Now what does ELC mean to you?
- Can we (should we) measure ELC? If so, when?
- What should we do next?

1530 Close Chanasyk/Powter

Legislation and Policy

Legislation and Approvals

Environmental Protection and Enhancement Act

Definitions

1 In this Act,

(ddd) “reclamation” means any or all of the following:

- (i) the removal of equipment or buildings or other structures or appurtenances;
- (ii) the decontamination of buildings or other structures or other appurtenances, or land or water;
- (iii) the stabilization, contouring, maintenance, conditioning or reconstruction of the surface of land;
- (iv) any other procedure, operation or requirement specified in the regulations;

Prohibition

60 No person shall knowingly commence or continue any activity that is designated by the regulations as requiring an approval or registration or that is redesignated under section 66.1 as requiring an approval unless that person holds the required approval or registration.

Prohibition

61 No person shall commence or continue any activity that is designated by the regulations as requiring an approval or registration or that is redesignated under section 66.1 as requiring an approval unless that person holds the required approval or registration.

Changes requiring approval

67(1) No person shall, with respect to an activity that is the subject of an approval, make any change to

- (a) the activity,
- (b) the manner in which the activity is carried on, or
- (c) any machinery, equipment or process that is related to the carrying on of the activity unless an approval or an amendment to an approval authorizing the change is issued by the Director.

Duty to reclaim

137(1) An operator must

- (a) conserve specified land,
- (b) reclaim specified land, and
- (c) unless exempted by the regulations, obtain a reclamation certificate in respect of the conservation and reclamation.

(2) Where this Act requires that specified land must be conserved and reclaimed, the conservation and reclamation must be carried out in accordance with

- (a) the terms and conditions in any applicable approval or code of practice,

- (b) the terms and conditions of any environmental protection order regarding conservation and reclamation that is issued under this Part,
- (c) the directions of an inspector or the Director, and
- (d) this Act.

Lieutenant Governor in Council regulations

146 The Lieutenant Governor in Council may make regulations

- (b) respecting the establishment of standards or criteria to be used to determine whether conservation and reclamation have been completed in a satisfactory manner, including, without limitation, the standard of reclamation of specified land to its equivalent capability;

Conservation and Reclamation Regulation

Definitions

1 In this Regulation, and, in the case of clause (t), for the purposes of Part 6 of the Act,

- (e) “equivalent land capability” means that the ability of the land to support various land uses after conservation and reclamation is similar to the ability that existed prior to an activity being conducted on the land, but that the individual land uses will not necessarily be identical;
- (j) “land” means terrestrial, semi-aquatic and aquatic landscapes when the term is used in the definitions of “land capability” and “equivalent land capability”;
- (k) “land capability” means the ability of land to support a given land use, based on an evaluation of the physical, chemical and biological characteristics of the land, including topography, drainage, hydrology, soils and vegetation;

Objective

2 The objective of conservation and reclamation of specified land is to return the specified land to an equivalent land capability.

Approval Conditions

The following clauses are taken from the Suncor Approval (example of requirements related to reclamation and capability)

1.1.2 In all PARTS of this approval:

- (n) "commercial forest" means land characterized by all of the following:
 - (i) forest stands stocked with trees to meet the standards of a commercial forest as defined in the Alberta Timber Harvest Planning and Operating Groundrules, 2000, as amended;
 - (ii) forest stands stocked with native tree species as defined by the Timber Management Regulations AR 60-73 (144.2), 2000 as amended that may include White Spruce, Black Spruce, Jack Pine, Aspen Poplar, Balsam Poplar, Balsam Fir, White Birch and Larch;

- (iii) forest stands not limited by operating restrictions such as slopes steeper than 45 percent, with the exception of tailing sand structures with slopes over 20 percent; stream buffers; potential recreational lakes; stand size; arrangement or accessibility as identified in the Alberta ALPAC Timber Harvest Planning and Operating Groundrules, 2000 as amended; and
- (iv) other characteristics specified in writing by the Director;
- (z) "disturbed land" means any land disturbed by the approval holder in any manner in association with the activity which is the subject of this approval;
- (jj) "forest ecosystem" means the sum of the plants, animals, environmental influences, and their interactions within a plant community predominantly of trees and other woody vegetation, growing more or less closely together;
- (bbbb) "reclamation" means the stabilization, contouring, maintenance, conditioning, reconstruction, and revegetation of the surface of the land to a state that permanently returns the land to a land capability equivalent to its pre-disturbed state;
- (hhhh) "self-sustaining" means able to support various land uses after land conservation and reclamation is complete without requiring the use of fertilizers or any other special management;

6.1.6 The approval holder shall reclaim the land so that the reclaimed soils and landforms are capable of supporting a self-sustaining, locally common boreal forest, regardless of the end land use.

6.1.7 The approval holder shall revegetate disturbed land to target the establishment of a self-sustaining, locally common, boreal forest integrated with the surrounding area, unless otherwise authorized in writing by the Director.

6.1.11 The Mine Reclamation Plan referred to in subsection 6.1.10 shall provide the detailed operational plan for development and reclamation for a specified period of operation. The plan shall:

- (d) detail the procedures that will be used to ensure reclamation to an equivalent land capability;

6.1.24 The approval holder shall return disturbed land at a minimum post-disturbance area of land capability class illustrated in TABLE 6.1-A, or as otherwise authorized in writing by the Director.

TABLE 6.1-A: LAND CAPABILITY CLASS

LAND CAPABILITY CLASS	PRE-DISTURBANCE AREA (HECTARES)*
1	0
2	2,564
3	1,808
4	4,451

5	10,535
Total	19,358

*as amended from time to time

Policy

There are a variety of government policy documents that reference reclamation objectives, Equivalent Land Capability and land use.

Fort McMurray-Athabasca Oil Sands Subregional Integrated Resource Plan

Surface disturbances resulting from mineral exploration and development will be progressively reclaimed. Sites will be reclaimed to a level of capability equivalent to the pre-disturbance level, optimizing the values of watershed, timber, wildlife, fish, recreation or other resources.

Alternative reclamation approaches may be considered (e.g., reclamation of borrow pits or cooling ponds to waterfowl nesting or stocked fishing sites). See the Landscape Reclamation Strategy in Subsection 4.4 for suggestions regarding site-specific reclamation.

The merits of agricultural development on reclaimed lands, or on other suitable sites, will be considered on a site-specific basis.

Public land within the Green Area is typically reclaimed to a condition that will produce forest growth similar to that which existed before development. In an effort toward achieving economic diversification, the potential exists to explore alternative reclamation approaches, particularly for those lands where oil sands extraction has occurred.

Mildred-Kearl Lakes Resource Management Area

Landscape Reclamation Strategy

Objectives:

1. To develop a reclaimed land base of capability equivalent to a boreal forest environment and that will support a range of activities, including timber harvesting, wildlife and fisheries habitat, extensive recreation and traditional Aboriginal uses.
2. To develop a reclaimed land base that will encourage and support a diversity of wildlife species (e.g., waterfowl, shorebirds, furbearers, ungulates and others).

Guidelines:

1. Disturbed forested lands shall be reclaimed to a level of capability equivalent to that which existed before disturbance. Where commercial forest is the reclamation objective, the capability will be measured in terms of meeting reforestation standards.
2. Commercial timber harvesting potential will normally be replaced on a project basis.
3. Following surface disturbance, the land should be reclaimed in a manner that re-establishes a watershed that resembles and functions as a natural system. The restructured soil profile shall be capable of supporting a variety of native vegetation.

4. Revegetation to a mixedwood boreal forest, using native species, will be the primary means by which the land base is reclaimed. The reclaimed land base will be capable of supporting a variety of uses, including timber harvesting, extensive recreation, traditional native activities, wildlife habitat (including fisheries and waterfowl) and watersheds.

Reclamation shall:

- (a) ensure that areas reforested for commercial timber harvesting are situated on lands that will maintain this capacity on a sustainable basis;
 - (b) recognize the importance of the river valleys in the Athabasca-Clearwater RMA and re-establish ecosystem connections between reclaimed areas and the river valleys;
 - (c) use a wide variety of native tree species and understory vegetation; leave small openings throughout revegetated areas; and
 - (d) encourage the development of permanent ponds, sloughs and small lakes, with and without connecting streams and with and without the ascent meadows.
5. Future uses of reclaimed land, should also be compatible with existing and planned uses for adjacent lands.
 - (a) The final alignment for any permanent road constructed through reclaimed land should attempt to link existing and planned resource/land use development opportunities and also take advantage of opportunities such as scenic views of lakes/wetlands, river valleys and upland areas. Reclamation activity adjacent to permanent roads should also consider maintenance or enhancement of wildlife habitat and scenic values.
 - (b) Alternative land uses such as agriculture (e.g., market gardening, wild rice, tree farming), commercial recreation (e.g., golf courses, OHV parks) and secondary industry (e.g., sawmill, cement plant) may be considered, provided that suitable access to provincial highways, local markets and suitable soil conditions are evident. In addition, other related concerns identified by the Development and Reclamation Review Committee (coordinated by Alberta Environmental Protection) and the Municipality of Wood Buffalo should have been addressed.
 - (c) Areas within approximately 1.5 km of a permanent road, may be reclaimed to a variety of landforms to accommodate a range of potential alternative land uses.

During reclamation planning, landform provisions should be made to consider the following land use activities:

Agriculture:

To accommodate potential agricultural activities (e.g., grazing, bison ranching, wild rice, berry production), varied soil and drainage conditions should be considered.

Commercial Recreation:

To accommodate commercial recreation activities, flat, well-drained sites near infrastructure should be considered.

Some activities may require sites in proximity to populated areas and/or natural or man-made attractions (e.g., lakes, river valleys, and wildlife-viewing, historic or interpretive sites).

Secondary Industry:

To accommodate secondary industry development, flat, well-drained sites near infrastructure and population centres should be considered. Although the planning of industrial sites may vary according to the type of activity, a visual screen should be put in place between the industrial site and the highway.

Country Residential:

To accommodate country residential development, residential sites should be considered on areas with rolling topography and panoramic views within a treed landscape that avoids high-water tables, and that are buffered from adjacent adverse conditions (e.g., highway noise, and resource extraction).

6. Developers of larger projects should continue to contribute to research and development in land reclamation technology, that will reduce disturbances and protect the environment. Such contributions may either be on an individual or a shared basis (e.g., Alberta Oil Sands Technology and Research Authority, Reclamation Research Technical Advisory Committee).

Guidelines for the Preparation of Applications and Reports for Coal and Oil Sands Operations

With respect to land capability, the Council defines this term as the ability (i.e., ability unaltered by any level of future management inputs, activities or alterations) of land resources to support a given land use on a sustained basis. Land capability refers to an evaluation of the chemical and physical characteristics of land and the determination of inherent or natural abilities of land resources to provide for use. It includes any existing abilities and conditions which are the result of alterations or management practices prior to the development.

As ordinarily used, land capability is an expression of the ability of land to support various uses such as agriculture, forestry, wildlife and recreation. The return of equivalent land capability does not imply that the various types of land capability will be identical to pre-disturbance conditions. Rather, it provides for flexibility such that individual land capabilities may change but overall land capability will be equivalent to pre-disturbance capability. In some instances, land capability can be improved; the Council encourages the development of reclamation plans and technology to this end.

Land Capability Classification System

The goal of reclamation in Alberta is to achieve land capability equivalent to that which existed prior to disturbance. The *Land Capability Classification System for Forest Ecosystems* manual (LCCS) is a working document intended to facilitate evaluation of land capabilities for forest ecosystems on natural and reclaimed lands in the Athabasca oil sands region, as required by Alberta's *Environmental Protection and Enhancement Act* (EPEA) approvals, and by current Alberta Environment terms of reference for Environmental Impact Assessments.

Because the link between LCCS rating and forest productivity is currently undemonstrated, the LCCS should be considered as one in a suite of tools for site evaluation and reclamation planning, rather than a comprehensive system that alone will ensure replacement and documentation of equivalent land capabilities. Reclamation certification (e.g., for a commercial forest use site) will ultimately be evaluated based on above-ground measures of site productivity as well as on the LCCS rating, and on other landscape characteristics

Oil Sands Mining End Land Use Committee Report and Recommendations

Each of the three major land use categories of natural and conservation areas, human development and forestry will accommodate associated multiple land uses.

Over time, as new or unique associated land uses are identified, they may be considered subject to consultation with Alberta Environmental Protection, the Regional Municipality of Wood Buffalo and all stakeholders in the Region.

Reclamation should ensure the evolution of productive natural ecosystems with the objective of re-establishing a diversity and abundance of wildlife habitat types and qualities consistent with pre-disturbance levels. Oil sands reclamation shall comply with the wildlife objectives of the Fort McMurray-Athabasca Oil Sands Subregional Integrated Resource Plan. Relevant objectives of the Plan, including wildlife habitat and population objectives for black bear, deer, moose, bird game and furbearers, shall be incorporated into all reclamation planning.

Pre-disturbance fish bearing capability will be re-established.

Oil sands operations will return forested areas to a productivity equal to or better than pre-disturbance levels, with at least an equal land area. To maintain biodiversity, the forested areas will be planted to a similar species mix as existed at pre-disturbance. These forest stands are to be developed in contiguous blocks as appropriate for efficient forestry operation.

Where oil sands mining has displaced pre-disturbance land uses, priority will be given to reestablishment of these land uses.

The Oil Sands Industry and interested stakeholders will work with Métis and First Nations people, within the Regional Municipality of Wood Buffalo, to develop reclamation guidelines for replacement of traditional land uses.

Stakeholder Comments from Reclamation Challenge Dialogue

The following information was taken from the report

Jones, R.K. and D. Forrest, 2010. [*Oil Sands Mining Reclamation Challenge Dialogue – Report and Appendices*](#). Oil Sands Research and Information Network, University of Alberta, School of Energy and the Environment, Edmonton, Alberta. OSRIN Report No. TR-4. 258 pp.

Equivalent Land Capability Session – Workshop Summary

Alberta legislation is absolutely clear in stating that the end objective of reclamation of lands disturbed by mining is “equivalent land capability”. What is far from unambiguous, and less clear, is what “equivalent land capability” means. It was clear from both the feedback to the initial Challenge Paper and Progress Report, and from the discussion at the workshop, that there are many interpretations of what “equivalent land capability” does mean and what it “should” mean. There is confusion about the origins and application of the concept and many people equate the concept of capability with the measurement of capability. It is critical that regulators, planners and practitioners thoroughly understand what it means and what it implies.

The concept of capability was used in the Canadian Land Inventory (CLI) series of reports as a way of describing the potential of landscape/soil units to support agriculture, forestry, recreation, or wildlife. Capability was assessed using 7 classes. Class 1 denoted the highest suitability for the intended use with essentially no limitations. Class 7 denoted landscapes on which the

intended use was not possible. Subclasses are used to describe the nature of the limitation that causes the land to be downgraded from the maximum value that the climate and soil would allow.

Capability is not an intrinsic property; rather capability is an attempt to describe potential or suitability for a particular intended use. For example, a site with characteristics that would make it Class 1 land for alpine skiing recreation would make it Class 7 for an airport to service commercial jet aircraft, and vice versa. In oil sands Land Capability Classification System (LCCS)(CEMA 2006) terms, Class 5 may be poor forest land but could be Class 1 for wetlands.

Capability is also not about productivity; rather it focuses on potential for the land to produce, given appropriate management. The historic language “capability equal to or better than” is not about capability; rather it is about a focus on a particular land use. For example, if an undisturbed site was originally Class 5 (wetness) for forestry, it might be made better for forestry by reclaiming it to avoid ponding. Thus, the site would have a higher capability for forestry. But that same site might have been Class 1 for moose habitat prior to disturbance and be reduced to a much lower class through removal of the ponds.

In attempting to provide guidance for practitioners with respect to reclaiming to and determining whether a site had been reclaimed to “equivalent land capability”, the Reclamation Working Group of CEMA developed the LCCS. This system, which focuses on capability for forestry, seeks to establish objective, quantifiable criteria for classifying the capability of land for a specific purpose.

Discussion at the workshop highlighted numerous issues and concerns with the effectiveness of the LCCS as a predictor of performance of forests built on reclaimed landscapes. Considerable discussion focused on modifications to the existing framework that would strengthen it. Others suggested alternative approaches that would replace the LCCS altogether. Still others clearly equated the concept of Equivalent Land Capability with the practice of the LCCS and on that basis rejected outright the concept of capability as having any relevance to managing reclamation.

Even though Equivalent Land Capability doesn't mean “the same as before” many people believe it should. Growing expectations that are shifting “reclamation” to “restoration” may also affect the concept and the practice. We need to manage expectations by speaking of trajectories, expected end points and key measurement and certification points in time. Regarding spatial scales, it is easier to define and measure Equivalent Land Capability on a smaller scale than at the landscape level or higher.

In short, the conclusion of the dialogue was that there is a high need for more conversation on this topic/issue before we can achieve alignment on the use of “equivalent capability” as an effective tool.

Equivalent Land Capability Recommendations

Recommendation 3: Develop a “capability manual” to better define what Equivalent Land Capability means and relate that to certification criteria.

Recommendation 4: Conduct a dialogue and workshop focused solely on Equivalent Land Capability in the fall to flesh out ideas for developing policy, practice and communication options.

Stakeholder Comments

The following comments were received from stakeholders responding to the various stages of the Reclamation Challenge Dialog. They are provided here to show the wide range of opinions and understanding related to Equivalent Land Capability.

General Comments

Equivalent land capability is a poorly understood term which is so vague as to mean many different things to different people.

The bounds of equivalent capability need to be carefully discussed and guidelines of how far afield reclamation may stray and still receive credit for reclaiming need to be put forward. Classic jokes exist about bison pastures and artificial eskers, and inland salt marshes. It is like calling someone an expert marksman because they shoot a hole in the paper THEN draw concentric circles around the hole showing that every shot is a bullseye.

This is the regulatory definition; what is missing in the definition is the way it is implemented in real life. Specifically, the definition suggests that alternative uses are allowed if the reclaimed land still has the ability to support the original uses. In fact, the original intent was to allow alternate uses **in place of** the original uses. There is flexibility (and lots of examples) in the application of this reclamation objective to allow a completely different use – e.g., an end pit lake, leave a road, or transform a gravel pit into a residential development. Many people in discussing oil sands reclamation seem to feel that the only way an alternate use should be allowed is if the soils and landscape are replaced with the “right” use in mind and then allow the alternate use to exist on top of the “right” building blocks. These two different interpretations can lead to vastly different costs for industry and a general avoidance of any discussions of alternate uses.

We are very far from “achieving a functional boreal ecosystem”. Having equivalent as a statement is useful to set some very high-level direction. However, it seems that this stops short of providing real directions since the common criticism is that no one knows what this means. Thus, at this time, equivalent capability does not achieve much. It needs to be defined – not only in words, but in terms of empirical knowledge. The LCCS does not come close to achieving the stated goal.

The “equivalent capability” or “good-as-new!” approach. This approach holds that we will be able to return post-mining landscapes to a state that is not identical to the pre-disturbance setting, but one that will be virtually indiscernible from the pre-disturbance state, at least in its capacity to support ecological functions, goods, and services. Related concepts in approvals, such as “locally common, self-sustaining boreal forest communities” take this concept even further, suggesting that the *form* of the post-mining landscape will be similar to pre-disturbance, in addition to the *function*. Equivalent capability clauses are generally careful to not give the

impression that conditions will be *restored* to a pre-disturbance state, but leave the overall impression that they will be “as good” as that state. Although sincere and well-meaning, these clauses may create unrealistic expectations in regulators, industrial operators, and stakeholders. They also support the premise of “sustainable” mining, particularly among perhaps less-informed members of the public whose land is being managed by regulators and treated by operators. This premise holds that mining is a short-term land-use, and that land will be returned to the Crown (public) in as good a state as it was lent in.

The blended requirements are needed because of requirements of the act to meet equivalent capability suitable for pre-existing land use capabilities incorporate a bit of reclamation and restoration: landform design plus soil and vegetation.

I have trouble reconciling the idea that reclamation does not need to consider ecological integrity. Especially given that reclaiming to equivalent land capability means land uses that are “similar to the ability that existed prior to an activity being conducted on the land”. If reclaimed land only needs to be of “some” form that is useful to humans, how do we decide which humans they should most support?

“Reclamation” in the oil sands is not interpreted as ‘returning to some form’ – for example, it is no longer acceptable to reclaim to a monoculture of mercantile timber. Stakeholders and Albertans are pushing for reclamation that resembles restoration.

We need to recognize that the goal of oil sands reclamation is to reclaim the land such that the reclaimed soils and landforms are **capable** of supporting a self-sustaining, locally common boreal forest, regardless of end land use. The post mining landscape is going to look different than the pre-disturbance boreal landscape. There will not be the same proportions of uplands, wetlands and lakes than existed previously; nor, will there be the same types of wetlands.

The ecosystem when reclaimed should provide comparable ecosystem goods and services as prior to disturbances. The *Environmental Protection and Enhancement Act* that the land should be reclaimed to a condition similar to pre-disturbed conditions. Why are we deviating from the legislation?

For example, we can show that white spruce and aspen poplar grow and have a closure of canopy in about 20 years, but does not support the biodiversity values, aboriginal values, wildlife habitat values as prior to disturbances. Yippie, we can grow trees, but what about the rest of the values. Canadians expect more.

Is it “capability” that is the target, or the actual functioning landscape? If an operator turns a pond back into a trafficable surface that is “suitable” for upland forests, does it need to be reclaimed to a forest?

Site has equivalent land capability if has similar attributes to natural, healthy, similar seral-stage ecosites. Also the proportion of ecosystems on the landscape is similar to pre-disturbance conditions.

Ultimately nature will decide what thrives within a specific locale, regardless of what Aspen density or benthic species distribution targets we decide on. Perhaps letting nature take over is the better plan.

The summary of the major regulatory changes clearly demonstrates that reclamation and its regulation is based on an agricultural model which is in my opinion a major stumbling block in the development of reclamation standards and approaches on disturbed lands especially in forested systems. This continues to drive the reclamation strategies.

Care needs to be taken to ensure that land capability and capacity is not related solely to human expectations but rather incorporates a diversity of ecological functions. Also – why is the definition of reclamation human-centric? This removes a set of end land uses particular to wildlife habitat and other ecosystem services that have little to do with human use.

‘Similar to pre-disturbance’ is a good concept and should be supported. However somewhere it should be noted that the definition of ‘similar’ can be a real sticking point in these instances. As we recently emphasised when reviewing the 2007 Wetland Reclamation Guidance, at the next level of detail (i.e., marshes vs. fens vs. bogs) it may not be possible to match pre- and post-mining areas of wetland types even on a relatively large scale due to uncertainties with regards to the extent to which some types can be successfully established.

Act, Regulation, Approvals

The law requires companies to return lands that they are reclaimed to ‘equivalent land capability’. Section 4.3 point 10 reads... “companies are required to reclaim and remediate land to a state capable of supporting the same kind of land uses as before disturbance”. Yet section 4.2 point 6 says that “the individual land uses will not necessarily be identical”. The latter statement is correct: the former is not.

Equivalent land capability doesn’t necessarily mean it was similar to before disturbance and this is what the current regulations state.

The EPEA legislation and its Regulations only require reclamation – not restoration, and AENV clearly communicates this fact to stakeholders.

Approvals dictate the requirement to reclaim to equivalent land capability and it is being done.

Relationship to Land Use

I believe that ecological sustainability is more important than achieving specific human use benefits. The definition of productive use is important – this must not just be focuses on human use; ecological productivity is more important.

Remember overlapping end land uses ... they are not independent of each other. Wildlife, recreation, First Nations use, forestry, all can occur at the same location.

The most important challenge is developing the understanding that acceptable or desired end land uses will not all be achievable at every site. Achievement of some uses will mean others cannot be achieved. The important decision is how are the defined uses for an area going to be

selected (defined); who is going to make the final decision? A key factor is to remember that defining the exact use for an area, needs to be decided early in the process as the initial mining operation may establish a landform type that narrows the range of available end land uses. This becomes very important when defining specific end lands uses for existing developments. The range of options is unlikely to be a great as what can exist for an area prior to development.

I wonder how much difference there is between what can be considered “equivalent capability” and an “alternative desirable end land use”? I think each of these phrases will mean something different to different stakeholders. My current understanding of equivalent capability is that it is intended to mean a mix of boreal upland and wetland rather than true fidelity to historic ecosystems (which is what I would personally consider to be equivalent capability).

From the last sentence “... a state capable of supporting the same kinds of land uses as before disturbance” is too limiting as land use has frequently changed (wetlands to forested lands; change in land characteristic which support different veg regimes; real change in land use e.g., forested to recreational; etc.). The reclamation requirement is equivalent land capability, a term which provides necessary latitude to permit a change in land use that has equivalent perceived benefit.

How about generating a discussion around alternative habitat creation, and alternative land uses aside from the boreal forest. What about commercial agriculture or forestry operations. If this area was just a bit further south, we would be clearing it, draining the muskeg, and looking for “equivalent” use that did not involve the forest at all. Let’s explore this opportunity to create something rather than maintain the status quo. It is no intellectual challenge to put it back the way it was.....why not make something better.

End land use capabilities are local and regional opportunities made up of a spatially diverse mix of land resources. Having more of one opportunity on a reclaimed mine site as compared to another would be acceptable depending on the starting point. The suitability of a closed mine site for multiple land uses will be dependent on the predevelopment resources of soil, the amount and area of chemically challenging materials left on or near surface that affect the soil and the landform designs that promote sustainable and functional landforms.

If an area had been upland boreal and had provided recreational opportunities, you could consider a lake as an equivalent capability as it too can offer recreational opportunities.

Nevertheless, I think the primary end land uses that should be considered for the reclaimed landscape are wildlife habitat and traditional use, which are probably inseparable and highly related. I think that what has been the primary end land use guiding reclamation, commercial forestry, is of little interest, except that it allows application of standards (stocking, growth rates) that provide proxy measures of Net Primary Productivity.

It is possible that these reclaimed plant communities will evolve into “novel ecosystems”, rather than resembling adjacent/pre-disturbance non-industrial communities.

Creating alternative end land uses will be a lot easier than reclaiming to equivalent capability (or something that looks natural).

Stakeholders may choose different land uses than were there before mining – is this then not reclamation?

Boreal Forest is Goal

The current overarching goal is return to locally common boreal forest.

“Similar to pre-disturbance boreal landscapes”: Another meaningless statement. How similar? What is the spatial extent of the pre-disturbance landscape? Over what time scale?

I agree with these outcomes but at the same time I think that these outcomes are somewhat limiting by specifying that oil sands development will be reclaimed to functional boreal ecosystems. Yes I am aware that the term “boreal ecosystem” is quite open-ended but, considering reclamation challenges encountered to date, maybe we should consider just creating functioning ecosystems instead of “boreal ecosystems”.

While some of these end uses are attractive, the primary focus continues to be for the return of boreal forest ecosystems. These ecosystems are then compared to the pre-existing ecosystems, which provide a measure for the success of the reclamation. We believe the return of Boreal forest ecosystems on our reclaimed lands is a reasonable and prudent end land use.

Implications of Working in Green Area

The Fort McMurray Athabasca Oil Sands IRP 2002 says: "all public land in the Fort McMurray planning area is within the Green Area. The Green Area was established by Order in Council in 1948, to be managed primarily for forest production, watershed protection, recreation and other uses." So alternative end land use options within the forest context would be appropriate. Many stakeholders would be affected by a change away from the Green Area approach. The forest industry is a long-term source of jobs which relies on staple forest land base. Traditional Use stakeholders rely on the non-timber values of the forest as does the public for similar uses.

We should make it clear that we are operating in the green zone and practitioners should use the term restoration more often than reclamation. Reclamation by itself does not mean much. Restoration is a science and an art, making it more challenging. Reclamation is the easy way out.

On public land there should be no discussion or confusion about the issue we need to restore the ecosystems to functional systems resilient to disturbance as we cannot separate those from the surrounding natural systems which will continue be driven by natural disturbance regimes.

The most appropriate use of the reclaimed oil sand mines post-closure is a multiple land-use strategy of a Forest matrix managed for clean water quality, timber, non-timber values and traditional land uses. Intensive management of the forest landbase in partnership with the non-timber values would promote the highest value end uses for the next economy. Forestry and recreational tourism may be the most sustainable and fiscally attractive alternatives available in the oil sands closure landscape.

Wetlands

If peatlands cannot be developed on oil sands mine reclamation areas, other wetlands will be, and those wetlands have very valuable ecological outcomes. While I agree that research on the potential for developing reclaimed wetlands is valid; developing a reclamation and closure plan that requires development of a component that likely has a low probability for ecological resilience is not a good path forward.

Natural boreal wetlands implies peat lands. Peat lands tend not to be good habitats for waterfowl like diving ducks that need larger open water areas such as lakes, swamps or marshes. This distinction is important as the reclamation wetlands, which may always be primarily swamps or marshes, not peat lands, still provide viable habitats for wildlife.

The LCCS should not be used alone to determine equivalent capability of boreal ecosystems. The LCCS only addresses upland landscapes and so it is biased against wetlands (which have lower tree production). Wetlands comprise at least half of the pre-disturbance landscape and need their own value based classification for equivalent capability.

A Landscape Capability Classification System for Wetlands would bring significantly better integrity to the Equivalent Capability discussion.

Wetland success criteria are badly needed. A debate is emerging as to whether peatlands should be considered separately from the broader category of wetlands.

Measuring Equivalent Land Capability

We all have a broad sense of what they key land uses could be (i.e., traditional use, wildlife habitat, forestry, recreation etc.) on a reclaimed landscape, but more discussion needs to take place on how you know you have succeeded in reclaiming land to a particular land use.

There are generally two ways of dealing with the question of land capability in multiple land use natural systems such as this. 'Keep it general' as this seems to suggest, or get very specific resulting in great detail in expectations, certification criteria, and verification methods to show criteria have been met. Whilst the general approach provides less specific guidance in relation to expectations, it is usually preferable to the latter approach which is potentially fraught with difficulty, does not readily address differences between sites and offers little opportunity or incentive for companies to develop creative rehabilitation solutions.

It is important that the public realizes that the reclaimed areas will look different than what existed prior to disturbance, because the reclaimed sites are on an early successional trajectory. The public also need to recognize that even in a natural boreal forest there are disturbances such as fire, that cause the forest to not always look the same. As a result of this constant change the site will look different from year to year, which makes it a little bit more difficult to define success parameters and measure progress.

I am not convinced that long-term productivity will be achieved or maintained on reclaimed sites.

Equivalent Land Capacity: The definition, as presented, is meaningless. This is probably the most important issue in reclamation. Currently, there is no agreed-upon definition. EC could be defined in 3 ways: Structural EC, Functional EC, and in terms of the goods and services that ecosystems provide. Furthermore, most consider EC to be defined at the stand-level. This is simply false. EC can only be meaningfully defined at the landscape level.

The LCCS is really only appropriate as a tool to ensure minimum soil handling practices are within accepted limits and standards, and that there are no contamination issues in reclaimed material.

It should be noted that the LCCS was developed to assess the capability of natural and reclaimed lands to support upland forest productivity. Since its acceptance by the GOA; it has been applied to undeveloped wetlands, resulting LCCS classes 4 & 5 because wet areas do not grow upland forests very well. Salinity or droughty soil is most often the reason a reclaimed area would have an LCCS class of 4 or 5. The LCCS system would more appropriately assess the comparison of predisturbance to post disturbance land capability if it were not used to assess wetlands.

A complete set of targets, criteria, indicators and regulatory thresholds for oil sands mine reclamation needs to be established that support the reclamation certification process.

I believe that we should work towards development of targets, criteria and indicators, but do so with humility, recognizing that we will be primarily limited by our own knowledge and certainty, rather than by a reluctance to develop “hard targets”.

Now is the time to build an index of suitable reclamation rates. Forestry has this in the form of site index, LAI, Stand quality, basal area, and stocking rates. Non-commercial sites may use species richness, cover, biomass, organic matter accumulation, soil horizons, lack of invasive exotics etc.

The absence of targets, indicators and thresholds for reclamation is another area of investor uncertainty and risk. If companies are creating impacts without clarity about what the end state must be, it is impossible to assess the scale of reclamation liabilities and obligations.

Aboriginal Interests

A couple of thoughts from an aboriginal community’s perspective:

1. Critical wetland features to date cannot be recreated – bogs, fens, muskeg – this is where critical medicinal plants are collected (e.g., rat root).
2. There is skepticism that recreated lakes (either compensation lakes, or water capped tailings ponds, end pit lakes) will ever be productive and will likely never be used by aboriginal peoples for fishing
3. Reclamation is too slow, need to move all companies’ closure and reclamation plans to progressive reclamation and consideration should be given to “no net loss” to reclamation – can only disturb so much and then have to reclaim before any further disturbance

4. Aboriginal groups (and other stakeholders) should be part of determining reclamation certification of a piece of land

It is Fort McKay's position that, as a long-standing and long-term occupant in the region, that that community should have direct input into setting certification objectives and direct participation and influence in certification decisions.

Define the values of end land users that comprise a functional and healthy ecosystem (for example, water may meet water quality objectives but not be perceived to be of a quality to drink untreated; a man-made lake can be viable (functioning) for fish habitation but key consumption species may not be present; certain traditionally used berries may not be present in a functioning reclaimed landscape; animal movement corridors may be relocated or not present).

Traditional Use stakeholders rely on the non-timber values of the forest as does the public for similar uses.

"Muskeg" is certainly a critical element of the pre-industrial landscapes that supported/supports traditional use by aboriginal peoples.

I was of the thought from experience that the elders and aboriginal communities want the land to be the way it was prior to oil sands development.

The Key Challenge is based on the current reclamation standard of "equivalent land capability". Do all relevant stakeholders understand and accept this standard? Is it consistent with Aboriginal treaty rights to hunt, trap and fish?

Again, I think these miss the social/spiritual aspects of effective restoration. There is too much emphasis on the technical and not enough (none as far as I can see) on the social and spiritual aspects of restoration.

Alternate end land uses needs to have stakeholder (first nation) involvement.

In aboriginal culture, are sites (which include location, plants and surroundings) rather than only plants more important in terms of traditional ecological knowledge? Will an aboriginal community use a reclaimed site even if its newly established ecosystem is similar to a natural one?

Challenge Dialog Workshop Results

Equivalent land capability (ELC) is the cornerstone around which much of current reclamation practice is built. It is critical that regulators, planners and practitioners thoroughly understand what it means and what it implies. There continues to be considerable variance in the interpretation of the concept and its application. Phrases like "Equivalent Land Capability looks like ..." rather than "Equivalent Land Capability is ..." might be more in keeping with the idea that ELC is a concept rather than something that is measureable. Even though ELC doesn't mean "the same as before" many people believe it should. Growing expectations that are shifting "reclamation" to "restoration" may also affect the concept and the practice. We need to manage expectations by speaking of trajectories, expected end points and key measurement and

certification points in time. Regarding spatial scales, it is easier to define and measure ELC on a smaller scale than at the landscape level or higher.

ELC contains value judgments which change with time. The Land Capability Classification System (LCCS) assigns capability based on one value – e.g., upland forest is “good” – but this previous value has changed because wetlands are now also “good”, but are Class 5 “bad” using the LCCS. We should be referencing ranges of acceptable conditions that are based on current values. The LCCS clouds the ELC challenge because the classification system and the ELC concept are not the same thing; LCCS is but one part of a larger set of ELC assessment tools.

There is a need for a tool to compare reference areas to reclaimed areas that is consistent and can be easily applied. However, ELC cannot be indexed in “one” number or be measured universally. Many factors and requirements determine how ELC is measured such as approval conditions, vegetation performance expectations, land use, etc. But ELC should be about confirming that the basic components of a functioning and useful ecosystem are in place. Further, there is a need to understand how contamination and remediation fit into ELC. It is important to note that Alberta’s regulatory approach focuses on capability not productivity.

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APPENDIX 2: Workshop Presentations

This Appendix contains the following presentations made at the workshop:

- Chris Powter, OSRIN – Equivalent Land Capability History and Intent
- Cam Bateman, SilverBirch Energy – Equivalent Land Capability For Agriculture on Plains Coal Mines
- Justin Straker, Public Citizen – Equivalent Land Capability, Reclamation, and Perspectives on Public Expectations
- Tanya Richens, Alberta Environment – Equivalent Land Capability for Oil Sands Mines

Note – the slides on each page are read in the following order

Slide 1	Slide 3
Slide 2	Slide 4

Chris Powter, OSRIN – Equivalent Land Capability History and Intent

Equivalent Land Capability History and Intent

Chris Powter
Executive Director
Oil Sands Research and Information Network
School of Energy and the Environment
University of Alberta



OSRIN *Creating and Sharing Knowledge* 3

My bias

[ELC] is like calling someone an expert marksman because they shoot a hole in the paper THEN draw concentric circles around the hole showing that every shot is a bulls eye.

OSRIN *Creating and Sharing Knowledge* 3

Outline

- ▣ My bias
- ▣ History of ELC
- ▣ Legislation and ELC constraints
- ▣ Context for ELC
- ▣ ELC terminology
- ▣ Measuring ELC
- ▣ What I would change

OSRIN *Creating and Sharing Knowledge* 2

History



OSRIN *Creating and Sharing Knowledge* 4

History - 1963 to 1970s

- 1963 - *Surface Reclamation Act*
- Safe and secure site
 - Remove debris and level grade



OSRD
Creating and Sharing Knowledge

History - 1980 - 1983

- 1980 and 1982 - Minimum Reclamation Standards
- Soil salvage and replacement required for all activities



OSRD
Creating and Sharing Knowledge

History - 1970s

- 1973 - *Land Surface Conservation and Reclamation Act*
- Emphasis on productivity/performance



OSRD
Creating and Sharing Knowledge

History - 1983 - 1993

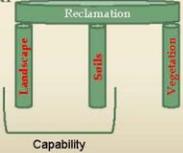
- Capability starts to be the goal
- 1984 gov/ind/ENGO capability workshop
- LCCS for coal mines (agriculture)
 - Maryk (1987)
 - Leskiw (1993)



OSRD
Capability

History - 1993 to present

- ▣ 1993 - EPEA/CRR
 - ELC enshrined in regulation as reclamation objective
- ▣ Reclamation criteria appear
- ▣ Oil sands LCCS
 - 1996 - First edition
 - 1998 - Second edition
 - 2006 - Third edition
- ▣ Reveg Manual
 - 1998 - First edition
 - 2009 - Second edition



Reclamation

Landscape Soils Vegetation

Capability

OSRIN Creating and Sharing Knowledge 9

Environmental Protection and Enhancement Act

- ▣ EPEA does NOT require reclamation to ELC
 - Does require conservation, reclamation and certification
 - Does provide for Regulation of *standards and criteria including, without limitation, the standard of reclamation of specified land to its equivalent capability*
- ▣ Reclamation definition doesn't mention revegetation
 - Consistent with capability concept, revegetation is a land management issue

OSRIN Creating and Sharing Knowledge 11

Legislation and ELC Constraints

OSRIN Creating and Sharing Knowledge 10

Conservation and Reclamation Reg

- ▣ CRR provides a definition of ELC
 - (e) "equivalent land capability" means that the ability of the land to support various land uses after conservation and reclamation is **similar** to the ability that existed prior to an activity being conducted on the land, but that the individual land uses **will not necessarily be identical**;
- ▣ But does NOT require reclamation to ELC - it states the **OBJECTIVE** of reclamation is ELC
 - Goal, target, vision

OSRIN Creating and Sharing Knowledge 12

Constraints

- Other legislation and policy (e.g., ASRD, ERCE, LARP)
- Approvals
- Criteria, standards, guidelines, etc.
- Technology
- Economics
- Company proposals
- Historical performance
- Stakeholder desires

OSRD Creating and Sharing Knowledge 15

Relationship to function (Land Use)

- Can't speak about capability unless there is a context for it
 - Capability for what - usually a land use (forestry, agriculture, recreation) or a function (watershed protection, fish or wildlife habitat)
 - Can be multiple capabilities for a given piece of land but we often speak of and measure the primary one (e.g., commercial forestry) and assume the others will fit in (e.g., wildlife habitat and recreation)
- Capability for what is a VALUES decision, not a technical one

OSRD Creating and Sharing Knowledge 16

Context for ELC

OSRD Creating and Sharing Knowledge 17

What the ELC Words Mean

OSRD Creating and Sharing Knowledge 18

ELC - Land

- CRR definition says land includes terrestrial, semi-aquatic and aquatic landscapes

OS2010 Creating and Sharing Knowledge 16

ELC - Capability

- Capability chosen for two main reasons:
 - Avoids 'productivity' problems
 - Limited field season
 - Impact of weather
 - Impact of management factors like fertilisers
 - Landowner interference
 - Allows for easier certification, especially when the ultimate goal is an ecological function or the desired vegetation is long-lived
 - Requires comfort that our understanding of response is 'right' or at least 'acceptable'
- Vegetation is used as confirmation

OS2010 Creating and Sharing Knowledge 17

ELC - Equivalent

- Not equal or same as
- Not better than
- Often goes back to same function BUT
- Provides flexibility for alternative functions (e.g., roads, lakes, industrial, commercial, residential, recreation)
 - Requires making a choice
 - Retain all materials necessary to support primary function and superimpose temporary function OR
 - Reclaim to new function characteristics (restricts future options)

OS2010 Creating and Sharing Knowledge 18

Measuring ELC

OS2010 Creating and Sharing Knowledge 20

Measuring ELC

- LCCS is an example of a measurement tool for capability
 - So is professional judgement!
- Given likelihood of multiple uses/functions in a boreal forest there is a need for:
 - Multiple measurement tools and/or
 - A super tool that aggregates the individual measures
- Reclamation certificate is confirmation of ELC
 - Wellsites - 21,068 Pipelines - 78
 - Pits - 285 Railways - 15
 - Coal - 19 Other - 17

21,432 RCs since 1993

OS2010 Creating and Sharing Knowledge 21

What I would change

OS2010 Creating and Sharing Knowledge 22

Clarify legislation and policy

- Change ELC definition to read ELC means
 - Providing the ability to support similar functions on a site OR
 - Providing the ability to support different, but agreed upon, functions, OR
 - Meeting reclamation certification criteria
- Publish a policy that clearly describes how the decisions of 'equivalent' and 'capability for what' are made, when they are made and by whom
- Decide if ELC is an "objective" or a statutory requirement

OS2010 Creating and Sharing Knowledge 23

Cam Bateman, SilverBirch Energy – Equivalent Land Capability For Agriculture on Plains Coal Mines



Equivalent Land Capability For Agriculture on Plains Coal Mines

Cam Bateman
Once and always a coal miner.
Now Oilsands – SilverBirch Energy (nee UTS)



Side 2 SilverBirch

The Plains Coal Experience

- Reclaimed and certified areas sold to private ownership and managed as part of existing farms.
- Reclaimed land renters attend the Reclamation Certificate Inspection and participate fully in the discussion.
- Complete home constructed on reclaimed land with own water well for potable water supply.
- Reclamation certificate applications for new reclaimed areas routine and at nearly at pace with areas being disturbed.



Side 3 SilverBirch

The Plains Coal Experience

- Thousands and thousands of hectares of reclaimed land certified using LCCS based certificate applications.
- Reclaimed land managed by private local producers as part of existing farms prior to certification.
- End pit lakes and surrounding areas reclaimed to productive fisheries and wildlife habitat and returned to Alberta Conservation Association for public fishing and hunting areas.



Side 2 SilverBirch

The Plains Coal Experience

- Social licence to operate supported by local community environmental advisory groups
- Local agricultural producers competing against each other to acquire more reclaimed land to support their agricultural operations.
- Coal Ash waste dumps reclaimed, certified, groundwater monitoring systems removed and land sold to private land owners.
- Alberta Conservation Association lobbying company to provide more reclaimed land to be used as wildlife conservation areas.



Side 4 SilverBirch

The Plains Coal Experience

- Local stakeholder concern regarding ability to reclaim to equivalent land capability? – none!
- Local stakeholder concern regarding reclaimed lands ability to support wildlife and waterfowl? – none!
- Local stakeholder concern related to surface water quality of wetlands and surface water bodies for livestock and aquatic life on reclaimed land? – none!
- Local stakeholder concern regarding surface water quality runoff from reclaimed lands to natural surface waterbodies? – none!

Slide 5 SilverBirch

The Plains Coal Experience

Why does the LCCS for reclaimed land on plains mines work?

- Long history of agricultural production records for original pre-mine soils under normal management
 - pre-mine productivity plots on all major map units – 10 year record for Class 3,4,5 and 6 landscapes.
- Detailed soil characterization at each site – land capability classification of modal sites (rooting, structure, consistence, bulk density, infiltration rates).
- Program firmly established validity of soil map for project site and land capability classification interpretations for permit area.
- Permanent forestry sample plots present in Oilsands

Slide 7 SilverBirch

The Plains Coal Experience

What planet did you say we were on?

Slide 6 SilverBirch

The Plains Coal Experience

Why does the LCCS for reclaimed land on plains mines work?

- A single regulator
 - AENV approved soil handling concepts and use of the LCCS in the application
 - AENV inspected reclamation progress
 - AENV received Rec Cert Application
 - AENV field truthed Rec Cert Application
 - AENV issued Reclamation Certificate
- Consistency in expectations.
- Qualified soil professionals on both sides
- Don't have a single regulator in the Oilsands.

Slide 8 SilverBirch

The Plains Coal Experience

Why does the LCCS for reclaimed land on plains mines work?

- Direct hands on active management of both premine soils and landscapes and reclaimed soils and landscapes – seeding/fertilizers/harvest.
- Same folks managing both premine and post mine landscapes with same equipment and practices.
- Provided direct comparison of pre and post mine performance.
- Developed a gut sense of performance/limitations/responses.
- If it looks like a premine Class 3, feels like a premine Class 3 and responds like a premine Class 3 – perhaps it is!
- Another set of goal posts in which to judge.
- Don't have an immediate a feedback mechanism in Oilsands

Slide 9 SilverBirch

The Plains Coal Experience

Why does the LCCS for reclaimed land on plains mines work?

- Continuous supply of newly reclaimed lands.
 - Lessons learned on last reclaimed land capability classification survey not forgotten between applications – if it was a class 3 last time it's gotta be this time too.
 - Consistency and agreement over time on use and application of deductions for those more objective soil parameters – consistence, rooting restrictions etc. – both on premine and postmine.
 - Eventually the company and regulator run out of things to argue over.
 - Not yet happening in Oilsands.

Slide 11 SilverBirch

The Plains Coal Experience

Why does the LCCS for reclaimed land on plains mines work?

- Ongoing inventory of Land Capability Classification maps – in annual reports to AENV.
 - Post mine land capability mapping conducted for each new reclaimed piece - preliminary.
 - Field performance and limitations of land monitored over several years after reclamation.
 - Reclaimed land soil survey and land capability assessment conducted to verify and revise preliminary map and then used as basis for certificate application.
 - Reduces the number of surprises.

Slide 10 SilverBirch

The Plains Coal Experience

Is the system perfect?

- Requires Professional judgement, willingness of both Industry and Regulator to meet half way.
- Requires recognition that the system is not perfect.
- Requires that regulator on behalf of the people provide flexibility in interpretation of the trade offs in both land use and land capability classes that can occur.
- Requires focus on a primary land use and recognition that lower land classes for primary use provide enhancement opportunities for secondary land uses.

Slide 12 SilverBirch

The Plains Coal Experience

What do we need to do to make it work in the oilsands?

- Proof is in the pudding – need more reclaimed areas on which to practice – corporate commitment.
- Confident regulator – proponents responsibility.
- Need more certificate applications.
- Alignment of reclaimed land capability expectations between departments.
- Focus on primary land use – forestry - and recognize that lower forest capability classes provide a great opportunity for enhanced wildlife/wetland/waterfowl capability.

Slide 13 SilverBirch

The Plains Coal Experience

What do we need to do to make it work in the oilsands?

- Patience and persistence!

Slide 15 SilverBirch

The Plains Coal Experience

What do we need to do to make it work in the oilsands?

- Equivalently qualified soil/forestry professionals on both sides.
- Open and transparent certification process.
- Agreement and cooperation with the next land tenant!

Slide 14 SilverBirch

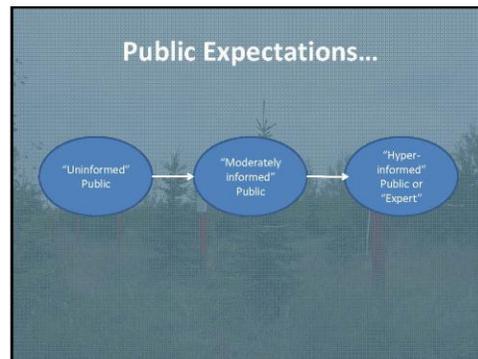
Justin Straker, Public Citizen – Equivalent Land Capability, Reclamation, and Perspectives on Public Expectations

Equivalent Land Capability, Reclamation, and Perspectives on Public Expectations

Justin Straker, Public Citizen

OSRIN Equivalent Land Capability Workshop
Edmonton, AB, Nov. 26, 2010

Photo courtesy Synchrade Canada



Public Expectations...

Two questions:

1. What does "the public" expect from reclamation and equivalent land capability?
2. What *should* "the public" expect from reclamation and equivalent land capability?

Industrial Use of Public Land ...as "renting"

Some similarities to the owner/tenant model:

- There is a resource (land, oil), owned by the public
- There is a tenant
- There is a "damage deposit"
- There is a contract

```
graph LR; A["Uninformed Public"] --> B["Moderately informed Public"]; B --> C["Hyper-informed Public or 'Expert'"]
```

Industrial Use of Public Land ...as "renting"

There are some dissimilarities, too...

- But there is an underlying principle:
- The landlord expects that when the tenant is done, the rental property will be in *about* as good shape as when it was rented.

```

    graph LR
      A("Uninformed  
Public") --> B("Moderately  
informed  
Public")
      B --> C("Hyper-  
informed  
Public or  
Expert")
  
```

Approvals

- e.g.:
 - “land reclamation’ means the stabilization, contouring, maintenance, conditioning, reconstruction, and revegetation of the surface of the land to a state that permanently returns the plant to a land capability equivalent to its pre-disturbed state”

Industrial Use of Public Land ...as "renting"

There is a lot of support for this point of view/expectation:

- EPEA’s CR Reg.
- Approvals
- EIAs
- Documents like MAC’s *Towards Sustainable Mining*

```

    graph LR
      A("Uninformed  
Public") --> B("Moderately  
informed  
Public")
      B --> C("Hyper-  
informed  
Public or  
Expert")
  
```

Regulations

The EPEA Conservation and Reclamation Regulation says:

- “ ‘equivalent land capability’ means that the ability of the land to support various land uses after conservation and reclamation is similar to the ability that existed prior to an activity being conducted on the land, but that the individual land uses will not necessarily be identical”

MAC's Towards Sustainable Mining:

Guiding Principles discuss "a demonstrated commitment to sustainable development", where sustainable development is defined following Brundtland, 1987:

"Development that meets the needs of the present without compromising the ability of future generations to meet their own needs."

Public Expectations...

Public polling indicates:

- 88% of Albertans felt that new oil sands mines should only be approved if companies can demonstrate that they can return mined areas to the way they were before mining began (Probe Research, 2007)
- This is the landlord/tenant model in action.

Public Expectations...

Two questions:

1. What *should* "the public" expect from reclamation and equivalent land capability?
2. What *does* "the public" expect from reclamation and equivalent land capability?

"Uninformed"
Public

"Moderately
informed"
Public

For these groups,
1=2

Industrial Use of Public Land ...as "renting"

This is a great model, underlain by excellent intentions, but, I would argue, fundamentally not real, and maybe not "grown-up".

Public Expectations...

Two questions:

1. What *should* "the public" expect from reclamation and equivalent land capability?
2. What *does* "the public" expect from reclamation and equivalent land capability?

"Hyper-informed" Public or "Expert"

For this group,
 $1 \neq 2$

An Alternative Model of Industrial Use of Public Land

In this case, Equivalent Land Capability is tacitly acknowledged as an "objective", but treated publicly as a statutory requirement.

In other words, it is used as a "lever", by different people/groups, for different purposes

"Hyper-informed" Public or "Expert"

ELC =



An Alternative Model of Industrial Use of Public Land

Mutual benefit, mutual cost

- Public and industry both extract massive benefits (\$, jobs, etc.)
- Attendant costs are assumed, and ELC is more about minimizing these costs while maximizing benefits

"Hyper-informed" Public or "Expert"

3 Challenges with Equivalent Capability

1. Potential disconnect between policy/expectations and reality;
2. Difficulties in defining, assessing, and documenting achievement of; and
3. The "hubris" of future land-use selection.

1. The "ELC Disconnect"

- Although likely not intentionally, ELC can perpetuate false expectations, or a disconnect between what "the public" might expect and what "we" might be able to deliver.

3. The "hubris" of future land-use selection

- a) the problem of selecting a single or primary land use;
- b) the problem of selecting future land uses; and
- c) the problem of who gets to select.

2. Difficulties in defining, assessing, and documenting achievement of

- Chris said ELC could mean:
 - Providing the ability to support similar functions on a site OR
 - Providing the ability to support different, but agreed upon, functions, OR
 - Meeting reclamation certification criteria
- But from my perspective those could be *very* different things

What I would change...

What *does* "the public" expect from reclamation and equivalent land capability?

=

What *should* "the public" expect from reclamation and equivalent land capability?
Accomplished through a careful articulation of ELC meaning and process, and matching expectation to ability



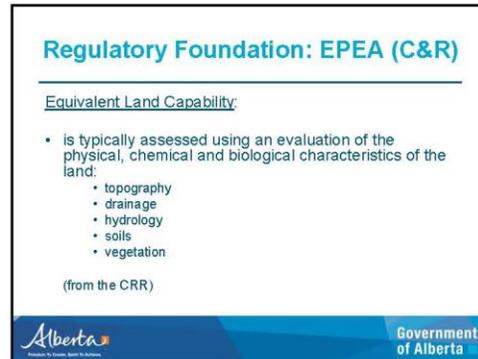
Alberta
Pursuing the Dream, Right to Achieve.

Equivalent Land Capability for Oil Sands Mines Workshop - OSRIN

November 26, 2010

Presented by:
Tanya Richens, P.Ag.
Reclamation Approvals Specialist
Northern Region, Alberta Environment, Edmonton

Government
of Alberta



Regulatory Foundation: EPEA (C&R)

Equivalent Land Capability:

- is typically assessed using an evaluation of the physical, chemical and biological characteristics of the land:
 - topography
 - drainage
 - hydrology
 - soils
 - vegetation

(from the CRR)

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Regulatory Foundation: EPEA (C&R)

Environmental Protection and Enhancement Act (EPEA)

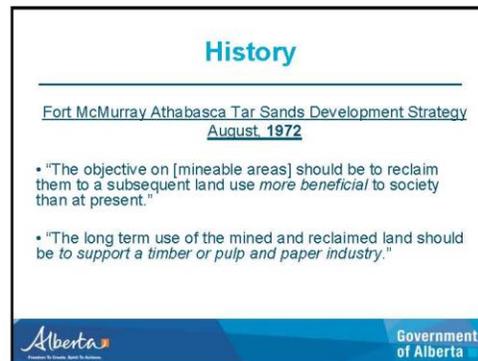
- **Duty to Reclaim:** an operator must conserve & reclaim, and obtain a reclamation certificate

Conservation & Reclamation Regulation

- **Objective** of C&R is to return land to equivalent land capability

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History

Fort McMurray Athabasca Tar Sands Development Strategy
August 1972

- "The objective on [mineable areas] should be to reclaim them to a subsequent land use *more beneficial* to society than at present."
- "The long term use of the mined and reclaimed land should be to support a timber or pulp and paper industry."

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Government
of Alberta

History

A Guide to the Preparation of Applications and Reports for Coal and Oil Sands Operations. March, 1991.

... "ELC does not imply that various types of land capability will be identical to pre-disturbance conditions"...

... "it provides for *flexibility*" ...

... "individual land capabilities may change but overall land capability will be equivalent to pre-disturbance capability".

Regulatory Foundation: EIA TORs

- Provide a conceptual conservation and reclamation plan for the Project considering:
 - **existing information** with respect to *land capability*, vegetation, commercial forest land base by commercialism class, *forest productivity*, recreation, wildlife, aquatic resources, aesthetics, traditional land uses and land use resources;

History

Oil Sands Mining End Land Use Committee Report & Recommendations. 1998.

A regional advisory body should be established as a forum for coordination of reclamation plans to ensure:

- Continuity of land forms & watershed systems across lease boundaries
- *Productive capability* of the landscape, *equal to or better than pre-disturbance*, is returned on a regional basis
- Land uses are located in areas or on land forms that make physical, biological, social & economic sense and *productivity objectives* are met regionally

Regulatory Foundation: EIA TORs

- **post-development land capability** with respect to:
 - i) self-sustaining topography, drainage and surface watercourses *representative of the surrounding area*,
 - ii) existing traditional use with consideration for traditional vegetation and wildlife species in the reclaimed landscape,
 - iii) pit lakes,
 - iv) wetlands,
 - v) self-sustaining vegetation communities *representative of the surrounding area*, and
 - vi) reforestation and forest productivity;

Regulatory Foundation: Decision Making

- **How is the ELC decision determined?**
 - Consultation by company with stakeholders pre-app
 - GOA, ERCB, stakeholders review EIA/application
 - ERCB makes public interest decision based upon project as proposed by company
 - Approvals issued can provide some influence on ELC
 - Significant landscape decisions are often driven by mine & tailings plan (e.g. where to locate facilities)
 - Changes to reflect regulator direction, new Government policy, or research & development can be integrated over time, through updates to plans


Government of Alberta

Regulatory Foundation: C&R Approvals

EPEA Approvals Provide:

- specific requirements related to C&R (e.g. soils)
- links to other guidance documents such as:
 - LCCS, Wetlands Manual, Revegetation Manual to use in the development of plans (they themselves are not the "standards")
- targets such as LCCS Table and TPR Table
- requirements to submit updated detailed 10 year reclamation plans & conceptual life of mine closure plans


Government of Alberta

Regulatory Foundation: C&R Approvals

EPEA Approvals
The approval holder shall:

- ... "reclaim the land so that the reclaimed soils and landforms are capable of supporting a self-sustaining, locally common boreal forest, regardless of the end land use"
- ... "revegetate disturbed land to target the establishment of a self-sustaining, locally common, boreal forest"....
- ... "design all landforms to have self-sustaining and integrated surface drainage" ... and "have natural appearances characteristic of the region" ...


Government of Alberta

Regulatory Foundation: Guidelines

- Land Capability Classification System (LCCS) for Forest Ecosystems in the Athabasca Oil Sands, 3rd Edition, 2006
- Guideline for Wetland Establishment on Reclaimed Oil Sands Leases, 2nd Edition, 2008
- Guidelines for Reclamation to Forest Vegetation in the Athabasca Oil Sands Region, 2nd Edition, 2009
- Best Management Practices for Soil Salvage & Placement, DRAFT, 2011


Government of Alberta

Regulatory Foundation: Time for Change

Challenges with Measuring Capability - LCCS:

- an evaluation of the relationship between the LCCS rating and site index (commercial forest productivity) was completed
 - LCCS is NOT effective in predicting site index on reclaimed sites
 - not pursuing an improved correlation between LCCS ratings and measured site indices
 - recognize other capability systems are required (e.g. wetlands, land use, etc.)
- developing a new *Reclamation Classification System* based on soil moisture and terrain – reflect site characteristics for targeting relevant ecological units, not site productivity




Regulatory Foundation: Challenges

What was there before?

- Issues with:
 - Naturally occurring hydrocarbons in soils vs. contaminated soils guidelines for reclamation
 - Naturally occurring saline/sodic overburden vs. management of material to minimize impacts to soil and water in reclamation
 - A flat landscape with shallow groundwater pre-development vs. a dryer, hillier landscape at closure




Regulatory Foundation: Time for Change

Challenges with Measuring Capability –
Timber Productivity Rating:

- Current TPR based on pre-disturbance site index - not species specific
- Develop TPR system based on individual species by ecosite phase as identified in the reclamation plans for commercial & non-commercial forestry end land uses
- Also, develop broader tools for assessment of capability beyond LCCS and TPR (e.g., plant community, etc...)




Reclamation Certification

- How is the ELC decision assessed?
 - Commitments made in:
 - EIA/application
 - updated reclamation & closure plans
 - operations
 - Requirements of:
 - approval conditions
 - approved plans which become extensions of approvals (and other Director authorizations) which often reference Guidelines
 - Inspector and supporting regulatory review team – professional judgement considering everything above




APPENDIX 3: New Reclamation Reporting Definitions

Contact: Tanya Richens, Reclamation Approvals Specialist, Northern Region,

780-415-9630

In 2009 Alberta Environment worked with Alberta Sustainable Resource Development and the oil sands mine operators to review the way that disturbance and reclamation information was historically reported to the Government through annual reports. It was understood that there were challenges and inconsistencies in how disturbance and reclamation were defined by the operators, and clear direction from the Government was required.

Alberta's State of the Environment previously reported on the categories: active, reclaimed, and certified, with little clarity on what the active and reclaimed categories represented.

The following definitions represent a clear, concise, and consistent way for information to be provided to Alberta Environment for tracking and public reporting. The data provided gives a clear snapshot of the status of the land, at the time of reporting. In order to better fit with field activities for soil salvage and placement, the period for reporting ends September 30 (the annual reporting period now runs October 1 to September 30 to coincide with soil salvage and placement plans).

The new definitions provide a better system for tracking the level of disturbance associated with oil sands mining, and the reclamation progress that the companies are making. Progressive reclamation activities are better represented, and a clear definition of each ensures better accuracy in reporting.

Due to the significant shift in definitions used for reporting, the new data cannot be compared to previously reported data. The new data is meant to provide a true State of the Environment for the mineable oil sands region as of September 30 of each year, and it will be updated on an annual basis using data provided by the operators in the Annual Reclamation Progress Tracking reports submitted to Alberta Environment.

Definitions:

EPEA Approved Footprint - is the total project area approved under the Environmental Protection and Enhancement Act approval issued to the company by Alberta Environment.

Mine Site Footprint - includes associated facilities. Includes all areas cleared, disturbed or reclaimed that do not fall within the definition of the Plant Site Footprint. For the purposes of annual C&R reporting, it includes tailings ponds and tailings related structures.

Plant Site Footprint - includes associated facilities. Plant Site is defined as the industrial plant site footprint (i.e. plant site proper). For the purposes of annual C&R reporting, it does NOT include tailings ponds and tailings related structures.

Total Active Footprint - represents the (cumulative) total area of land cleared plus disturbed plus temporary and permanently reclaimed, including land where reclamation material has been

placed but where the land does not yet meet the definition of permanent reclamation (e.g. is not yet revegetated).

Cleared – areas where vegetation has been removed for the purposes of preparing the land for drainage, soil removal, overburden removal, mining, etc. but where soil has been left mostly intact and relatively undisturbed.

Disturbed: Used for Mine or Plant Purposes – areas where at a minimum, soil has been removed or covered by other materials and soil would be required for reclamation purposes. This category includes all areas where soil removal, overburden removal, active mining, discard placement, material storage, etc. has occurred. End Pit Lakes are reported in the disturbed category.

Ready for Reclamation: No Longer Used for Mine or Plant Purposes - areas that are no longer required for mine or plant purposes and are available for reclamation but where reclamation activities have not yet commenced.

Soils Placed (Terrestrial & Wetlands & Aquatics) - areas where reclamation material has been placed, reporting for both terrestrial and wetlands & aquatics permanent reclamation combined. Land moves from the Disturbed category to the Soils Placed category once reclamation material is placed as per the approved Reclamation and Soil Placement Plans.

Permanent Reclamation (Terrestrial & Wetlands & Aquatics) – land is considered permanently reclaimed when landform construction and contouring, clean material placement (as required), reclamation material placement and revegetation has taken place. Land cannot be listed under permanent reclamation until revegetation has occurred which is reflective of the approved Reclamation and Revegetation Plans.

Temporary Reclamation (Terrestrial) – areas being managed where vegetation has been seeded, planted, or ingressed, where there is an expectation that future disturbance may occur at that location.

Certified - areas that have received a reclamation certificate under the Environmental Protection and Enhancement Act. These areas are not counted in the Total Active Footprint calculation because they are no longer active (they are returned to the Crown).

Age of Reclamation – the age is calculated based on the year that the area was considered permanently reclaimed. If previously reclaimed land is re-disturbed, the number of hectares is removed based on the year it was reclaimed so that the total amount of land at any given age is accurately reflected.

APPENDIX 4: Workshop Notes

The following notes were taken from the flip charts from each table. The notes from the tables have been combined and consolidated into themes.

SESSION 1: HISTORY AND INTENT OF EQUIVALENT LAND CAPABILITY

WHAT DOES EQUIVALENT LAND CAPABILITY (ELC) MEAN TO YOU?

Function

- So many uses, it is best described in terms of function
- It means that the soil can support something
 - Function of soils first, and
 - Goods and services second
- The function of ELC has to be addressed – re: desired end land use
- Function centric
- Functions to provide return of most impacted (compromised/limited) aspect of ecological services
- Need to define function
- Is not a function

Concerns

- Oil sands doesn't have solid base for measuring ELC
- Timeframes – set criteria around dates (3 years for agricultural?, 15 years for boreal?)
- Time gap between disturbance and ELC
- Context
- Large developments
- Separate science from regulatory
- Liability concerns:
 - AENV? Industry?
 - Mines – government 100% liability upon reclamation certification
- Remediation – lifetime liability?
- Can we reclaim a small area well? (disconnect)
- Is it useful for planning?
- Undefined use
- In the oil sands it isn't clear that ELC-based reclamation certification is resulting in desirable vegetation succession pathways
- Reclamation is constrained by engineering (e.g., wetlands and peatlands)
- Need new definitions due to new knowledge
- ELC definition needs work in regulations

Questions

- Focused on land?
- Should it be a decision or agreement as to what equivalent land capability is?

- Should presence of system components be measured?
- Overall plan for development is missing at times (neighbours)
 - e.g., in-situ
- Canadian Research Institute for Social Policy (CRISP - <http://www.unb.ca/crisp/index.php>) January 2011?
- Landuse Framework?
- Time scale?
- Measure ELC? Yes, soils, vegetation and water
 - Criteria indicators

General Comments

- It's a goal at the start and a measurement tool at the end
- Not restricted to soils
- A human value
- Must consider
 - Choices – end use
 - Value
- Social science/values
- Based on decision
 - What does society want, willing to accept
 - Acceptable = equivalent
- The objective for end land use plan should be first – then ELC used for planning and end measurements
- End use drives reclamation depending on reasonableness and values
- Planning for max future uses allows for preservation of most system components and land uses
- Re: native prairie, undisturbed controls are identified as desirable objectives and range health assessments used to measure “equivalence”
- Forest productivity-centric
- Area centric – concept to return to pre-disturbance
- Big picture: pre-disturbance but work at site level
- Dolphin factory: Kmart for Moose!
- Market driven – economic trade off
- Public perception ELC = Restoration
- Not restoration
 - Site A returned to site A
 - Or site A not returned to site A, but site B is returned to site A
- Value-based ELC system a blessing and a curse
 - Flexibility good because our values have changed over time
 - Flexibility is confusing – why we are here
- Capability and productivity
 - Definition?
 - Tool – only land cover classification system now
- Balance between regional landscape (20,000 ha) vs. local definition of LCC (1 ha)
- Spatial scale very important

- Return to equivalent land use values
- Farmland standard vs. forests
- Progressive reclamation
- Agreed upon goal
- ELC as an objective? It is needed
- Productivity is key to land use
- Acts as a closure mechanism
- Change to Agreed Land Capability or Agreed Land Use
- Need a process to determine how to agree upon the “end land use”
- A system to take into account the “agreed upon” end land use
- Two paths
 - Designated land use
 - Recreation area etc.
- End land use, end land use plan – scale
- ELC and landuse
- Restored so looks/functions are returned in the context of surrounding area
- Equivalent land capability vs. equivalent capability
- The building blocks are in place
- Evolved past landscape and soils
 - Land use involved
 - Trajectory to get there
- Focused on individual site
- Capability is to SUPPORT land use
- Equivalent:
 - Similar
 - Same
 - Values – problems, challenges

IS ELC AN APPROPRIATE ENVIRONMENTAL MANAGEMENT TOOL?

Yes

- Yes, tool can be interchanged with goal
- Yes, like it because it is flexible
- Yes, need something to work towards agreement on
- Only if the definition is agreed to
- Yes, need common stakeholders understanding of definitions
- Yes, in its absence, would industry do nothing?

No

- No, meaningless because so vague and flexible
- Not an appropriate tool – too broad
- No, it's clearly not clear
- No, not everyone understands

- No, in absence of ELC, legislation still requires reclamation
 - Reclamation goals need to be defined
- No, because focussed on use not environmental values

Suggestions

- Needs to provide clarity and certainty
- Word ‘land’ muddies the question
 - ELC vs. EC
- Acceptable Land Capability
 - Equivalent is a nuisance
- Rehabilitation should replace reclamation
- Needs very strong baseline data
- Need a ‘systems’ approach
 - To include water bodies, wetlands etc. and terrestrial systems
- Needs review and update every 5 years to adapt to change value
- Needs to be supported by measurable tools of ELC
- Need approvals requirements to be flexible to adapt
 - Somewhat are – renewals

General Comments

- Underlying ability to support a particular land use
- Requirements change
- LCCS
- If ELC is an objective, can it also be a tool?
 - It is an appropriate objective
 - The supporting tools are inadequate
- Planning tool – but plans change (long timelines, regulations)
- If not an appropriate tool what would be better?
 - It’s a component?
 - Traditional land use – basically restoration

CAN YOU SEPARATE ELC AND PRODUCTIVITY?

- Are closely and theoretically linked
- Yes, related and correlated
- Productivity equals the measure of success of ELC
- Better understanding of land use
- Productivity is driven by ELC
- Productivity is different for different land uses
- No, but care must be taken
- Productivity – what is result?
- Capability – what can result?
- Management inputs

- What is productivity?
 - Of what?
- Can take away from ecological side of things
- Classification
- Increase scope

CAN YOU SEPARATE ELC AND FUNCTION (LAND USE)?

- Need to understand functions first and know what is happening between the start (ELC) to the end (function)
- No, if we choose a land use the functions follow
- One is predicated on the other

DO YOU THINK WE CAN MEASURE ELC?

- Cannot measure ELC until it is defined
- Who is we? – should be many players with one decision maker. ERCB impacts concept
- We depends on scale
 - Regulators
 - Science
 - Industry
 - Public

SESSION 2: APPLICATION TO MINING

DOES THE CONCEPT OF ELC CHANGE WITH THE SECTOR OR JUST THE EXPECTATIONS AND MEASUREMENT TOOLS?

Yes

- Yes, e.g., different expectations in coal vs. oil sands
 - But it shouldn't change with the sector
LCCS ≠ ELC
- Yes, regulators view forest as providing for multiple uses
 - It changes depending on circumstances
- Definitely, expectations change with sector
- Yes, the concept changes with sector (complexity, perspective, expectations change, government regulatory players are different and public view vs. global view)
- Yes, definition of ELC changes with sector (concepts may not change?)
 - Function of land use decisions
 - Agencies – monoculture
 - Oil sands – unknown, complex
 - Therefore measurement tools – different in oil sands

- Agricultural wetlands – did work based on knowledge and natural
 - Did work due to micro scale
 - Need basic fundamentals to drive goal
- It shouldn't, but it does. The question is why?
 - Evaluation of excess
 - Weight of evidence
 - Higher expectation for oil sands
 - Deeper pockets??
- Yes, the expectation and measurement tools change
 - Land use changes region to region. ELC still works social expectation for ELU drives application of ECL
- Yes to expectations and tools

No

- No, because it's used in planning to rate chosen objectives
But it doesn't have common understanding across sectors
- Sector is not the main game-changer for ELC in oil sands
 - More landscape context
 - Scale of disturbance
 - First Nations – local stakeholders, land users
 - International interest stakeholders global
 - Who are the end users?
 - Public of Alberta
 - Forestry – simple, easy like agriculture
 - Oil sands clumped, multiple companies, brand names, spotlight on us
 - Public vs. private land – everyone has a say/interest in end land use
- Mining is constrained by the Act (Act needs to be updated)
- Mining is a catastrophic change (not good or bad – just is)
 - Adaptive capacity
- Wetlands – conserving
 - Lack of knowledge, technology
- No, it is the same for all
 - Tools are different
- No, just the decisions made
 - The approach changes
- No, fundamentally the concept of ELC does not change
- No to concept

Undecided

- Not applicable
 - Not a useful tool
 - Therefore need more emphasis on sector and expectations
- Comes down to definition of ELC
- Means different things to different people

- ELC is dependent on end land use (ELU)
 - At the beginning need an agreement between the regulator, stakeholder and applicant on the ELU and how that is measured.

Questions

- What parameters looking at a 15 yr forest that will/can be extrapolated to 50 yr forest?
- Words to productivity, capability may not work in oil sands context e.g., Carbon cycling
 - Confused, generational evolution
- Know the trajectories to set direction?

WHAT IS THE “RIGHT” SCALE FOR ELC ASSESSMENT – REGION, MINE SITE, LANDFORM?

- All three are important
 - All of them but focused on the landform
- Multiple scales:
 - Regional – need to integrate functions
 - Regional – not functional for individual developers
 - Depends on size of development
- All scales and levels are important
 - Need to be integrated
- Multi-scale: to manage all uses, need to look across scales
- Hierarchical system needs to be developed to get to end land use
- Region → Cumulative
- Regional: need to establish vision for the region
- Natural sub-region
 - Watersheds
 - Administration units (Regional Municipality of Wood Buffalo)
- Multi-mine – regional
- Mine – landscape scale. Still in the works, way too big too quick
- Landscape should be the scale
- The scale is the project. Within the project all needs are met.
- Regulatory scale is approval, however need regional evaluation – problem at border of mines
- Right scale, start at landform but connected to mine site → region
- Landform – working level for ELC, building block
- Site: difficult to measure at larger scales
- Not-regional: stakeholders set regional goals independent of ELC definitions
- One regulator – each regulator clearly defines needs, objectives and measures

Questions

- At what scale does input not matter?
- Bigger than mine site, but??
- ‘Assessment’
- ‘Right’ = value

WHAT ROLE DOES INDUSTRY PLAY IN DETERMINING ELC FOR A SITE?

- Industry to provide site-specific data and rationale
- Industries role is to define predisturbance ELC
- Industry drives ELC
 - EIA → PDA → dps → Reclamation
- Operator proposes ELU standard to GOA and stakeholders, based on values, economics, technical. If no agreement then project is no go
- Limited industry role to initially determine ELC (data provision/technical)
- Consults with stakeholders and government to determine proposed
 - End land use
 - Function
 - ELC goals
- Industry defines what is possible and seeks social license to proceed, monitor
- Industry facilitates development of targets
- Industry must get ‘buy in’ into plan from regulators and stakeholders
- Public interest perspective, regulator define goal → acceptable incomes at reclamation (ELC)
- Assuming stakeholders identify goals, industry writes the plan to achieve ELC, regulator reviews/approves
- Government has responsibility to set targets
 - Recognize industry has input as stakeholder, but once rules established, industry complies
- Ideally regulator sets ELC, industry complies
- In reality, government isn’t setting clear end use goals and there aren’t clear expectations for oil sands
 - Industry has more input thru adaptive management
 - Provides information on what is physically possible
- Lead innovation
- Chance for innovation – adaptive management
 - e.g., D074 (ERCB) provided a stimulus for tailings innovation
- Participate in multi-stakeholder conversations
- Lots but not final decision
- Weight of evidence
- Assesses pre-development equivalency
- ELC – ‘site’ what scale?
- ELC has been sold or accepted by the public as the measure
- Should outline process for ELC – too far in future to be very descriptive
- Rigid in requirements and methods but flexible in methods
- Stringent requirements up front without known/guaranteed outcomes
- Risk adverse and conservative

WHAT CAN WE LEARN FROM COAL?

- Thanks for the advice but we have a more complex problem

- Lots to learn from
- Everything
- A mine is a mine
- Be miners, not oil companies
- Follow your approval
- Need increased coordination from regulators
- They are lucky that they have only one regulator
- One regulator approach
- Deep understanding of landscape predisturbance
- More challenges in defining the final land uses and ELC's
- Economic value of end land use
- Agreed primary (or secondary) end land use, but far simpler system in coal (in an agricultural context)
- Oil sands are 30 years behind coal (only)
- Plants (grasses) are as complex as trees
- Agreed to criteria (oil sands mining is more complex)
- Integrate environment planning and mine planning
- Progressive reclamation
- Clear system
- Persistence works
- Their approach
- Successful reclamation approach
- Simplify the regulatory system
- Culture change
- Social acceptability
- Reclaim, reclaim, reclaim
- Research important but it's application is paramount
- Legislation provide the impetus for research and application in the coal industry

SESSION 3: PUBLIC PERCEPTIONS

WHO IS THE PUBLIC?

- Local, provincial, national, international, press (world), customers of oil (some are more 'entitled' to have a say based on regulations or position of power)
- Entire province – ELC largely affects Albertans
- Everyone?
- Everyone, therefore need to be careful of sources used to poll public opinion
- Hear everyone's perspective, but not everyone is going to be happy
- Different scales of public
 - Global public – do we owe them anything?
 - Directly affected – economic impact, liability
 - Backyardigans

- Two types of public (maybe gradient, not categorical)
 - Directly affected
 - Indirectly affected
- The public
 - The seen and heard
 - The unseen and not heard, not vocal
- People of Alberta including First Nations and Métis people
- People in Fort McMurray
- Those who are directly affected by the proposed activity
- Prioritize ‘public’ to local level
- Aboriginal Groups
- First Nation rights
- Taxpayers/voters
- Not-public – hyper uninformed public
- Matter of scale
- Associated interests on a given issue
- Age of information changes who is aware
- Public should be involved through the whole process – more involvement for directly affected
- Operator perspective: end land use decisions are made by local public
- Even local, directly impacted parties should have to go through similar due processes to set new land uses
- Special interest groups have louder voices, try to influence the public
- Degree of impacts should dictate voice/vote
 - First Nations higher impact
 - Albertans, Canadians, world next
- Should public be defined to include those who are misinformed?
- Base of public depends on need/purpose
- Moderates/majority of public opinion – don’t lead based on extreme opinions
- Can’t assume ‘status quo’
- Everyone but media
- Media – drawn to conflict, can pass along misinformation, voice of the public for good or bad
- What we hear from the media
 - Anyone who has an opinion
 - Media carries/amplifies public opinion

WHAT ROLE SHOULD THE PUBLIC PLAY IN ELC AND WHEN SHOULD THEY BE INVOLVED?

- When are the public involved?
 - Process
 - Defining the outcomes
 - Transparency vs. oversight

- Maybe at evaluation (but not sure how)
- Agreeing on overall process
 - How?
- Need to be involved throughout life of project
 - Legislation (as much as possible)
 - Regulations (public servants)
 - Approvals (directly affected)
- Multi-stakeholder
- Many subsets of public
- Media
- Investors
- Shareholders
- Elected officials
- Government is perceived to be representative of public
- Government represents their jurisdiction
- Could be through representatives of people (AENV/ASRD) or directly (direct users of land) in closure planning
- Public should be informed
 - Has input through democracy
 - Stakeholders give further input to government decisions
 - Government is accountable to voters
- The public forum through the landuse forum and through the Government of Alberta (GOA)
- Articulate the value set (direct) i.e., intrinsic values
- Consumer voice (indirect)
- Hold the GOA/industry accountable
- Land use decisions
- Have no veto
- Do they have a voice?
- Not sure how “Joe Public” gets view
- General public’s understanding is low, therefore there is a disconnect with their expectations
- Stakeholders should be involved in further defining ELC
- Stakeholders should be involved from the beginning of ELC definition
 - Need to ensure stakeholders are adequately informed so that their input is valuable
- Stakeholders should be involved in setting targets/end land use goals, but not in planning 10% land x and 50% land y
- Help determine/provide input into end land use
- End land use changes should be driven, but not solely determined by local populations
- Regulators should work to ensure that these ELU decisions are ecologically “viable”
- Define the values that guide reclamation endpoints
- Stakeholders involved with government during policy setting and industry during planning
- Public is everyone but stakeholders meet a test of interest

IS ELC FOR PUBLIC LAND “DIFFERENT”?

Yes

- Expectations are different
- Previous suggestion that expectations higher for “Albertan’s” land
- Different reclamation standards
- Yes, more complex, different values and end land uses need to be considered
- Should be the same but may not be
- Private landowner has more of a say in ELC is to some extent

No

- Pretty much the same (more issues of scale)
- No, should not be ELC different for public land? Fundamentally, conceptually no, but ELU decisions get made differently
- No, it’s the same. End land uses may be different
- No, ecological integrity needs land base that functions, regardless of private/public boundaries
- Shouldn’t be different
- Public/private distinction not appropriate
 - Should be between disturbed and undisturbed land i.e., cultivated land: different expectations than native/undisturbed
 - Regardless of private landowner at compensation

Undecided/General Comments

- *Public Lands Act*
- Transparency (private) – municipal zoning
- Liability → certification
- Distrust between government members and public
- No clear value system for public land
- Owner-interest – lease/rent
- Based on landuse and function
- Stakeholders rights need to be defined
- Should ensure enough habitat recovered so ecosystem capability not lost

ARE THERE PUBLIC EXPECTATIONS THAT ARE OUTSIDE ELC AND IF SO, HOW DO WE INCORPORATE THEM INTO THE REGULATORY DECISION PROCESS (ARE THEY IN ADDITION TO, OR IN PLACE OF ELC?)

Yes

- In addition to
- Try to integrate into the process and do what you can

- Education is greater than historically (knowledge)
- Keep them informed and engaged
- Pressure from more active/influential NGOs
- Pressure from public
- Because they don't know what it means, just like us
- Too many options and desires
- Public acceptability, too much on each hectare of land
- Some of it is our fault (industry/regulators) as we promise too much during EIA process
- Public expectation is restoration
- Progressive reclamation!
- Need to accept that productivity may come much later
- Certification for capability and productivity (in later years)
- For public land does GOA = the public?
- Industry wants political stability and to understand the expectations
- Multi-national industries come to make \$\$ in oil sands

No

- No, public expects restoration – ELC could be very different – capability
- No, who is the public?
- Different stakes in equity
- Informed democracy
- Increase public understanding of consequences
- Government must accept responsibility for clarifying roles and responsibilities
- Government remains silent when they need to step up and explain how they are looking after the public's interests
- Standard of living influence
- Tradeoff

Problem is we are trying to regulate everything including dialogue. Regulations squash adaptive management unless regulations are being adaptively managed.

SESSION 4: REGULATORY PROCESS

HOW SHOULD ERCB DECISION REPORTS, APPROVALS AND POLICY DIRECT THE SELECTION AND IMPLEMENTATION OF ELC?

- GOA should provide policy clarification for the project for the ERCB on ELC
- ERCB issue the first decision report following the hearing
- ERCB jurisdiction over tailings ponds, overburden dumps
 - How to construct and where to locate them is critical influence to final options for ELC
- ERCB have mines approval capacity and responsibility
- ELC is AENV and ASRD jurisdiction

- AENV/ASRD supplemental data request (ELC shows up in the AENV approval)
- Conflicting regulatory responsibilities
- Problem – no common understanding of what we want to achieve
 - How much production
 - Unfortunately, still far too much ‘siloining’ in government
- Co-regulators not each others’ stakeholders therefore require a higher level of communication
- Need very good communications between regulators
 - Currently there is not
- Need alignment with AE & ASRD on ELC definition
- What about Environment Canada?
- Iterative process
- Details not all known at approval stage
- Approval is contract
 - Agreement to do
 - Rental agreement
- Issue is some clauses are too generic
- Would reflect GOA policy, land use framework, regional plans and other land use policy to clarify ELC
- Be influenced by affected stakeholder testimony and company arguments
- Use reclamation not restoration and forget redemption (you need rehab!)
- Questions of their influence on ELC
- Operations increase/decrease = ELC
- TOR should include expanded definition of ELC based on stakeholder input
 - EIAs don’t measure historical baseline
 - Alberta Environment

WHEN SHOULD WE MEASURE ACHIEVEMENT OF ELC?

- Iterative and progressive
- As soon as possible
- Benchmarking along the way
- All the way along
- Over and over again until we are satisfied
- Ongoing, use adaptive management
- Don’t know the trajectories yet, but getting there
- In stages at milestones e.g. soil placements, decision points (no turn back), etc.
- After soil salvage, soil placement and revegetation
- Soil replacement and revegetation is more important than soil salvage as milestone
- Every 5 years: reasonable milestones
 - Don’t want surprises at rec. cert. application
- Time according to management intervention
- Continuous improvement
- Continuous (annually – publicly available)

- Certification at the end
- What scale?
- What age of site?
- Depends on definition
- Long term information is beneficial
- Determine correct trajectory
 - Use history to understand what the trajectory is
- Key – determine trajectory for each type (upland, wetland...)
- Graph: time to certify on y-axis vs. number of reclaimed projects on x-axis
- Look at natural/harvest data
- Informed by trials/rec. cert. attempts
- No real history for things like tailing ponds

PLENARY

NOW WHAT DOES ELC MEAN TO YOU?

- Joint decision with ASRD and AENV
- Question the validity of ERCB involvement

CAN WE (SHOULD WE) MEASURE ELC? IF SO, WHEN?

- Depends on end land use
- When on the appropriate trajectory towards ELC
- Can be measured fairly early, but repeated measurement over time needed (Forces land capability)

WHAT SHOULD WE DO NEXT?

- Capability tool measured by an inappropriate metric (productivity)

APPENDIX 5: Workshop Attendees

Name	Org Type
Andy Etmanski	Consultant
Anne Naeth	Researcher
Audrey Lanoue	Industry
Barb Logan	Consultant
Bonnie Drozdowski	Researcher
Brent Hartley	Industry
Brett Purdy	Government
Cam Bateman	Industry
Chi Chen	Government
Chris Hale	Government
Colleen St. Clair	Researcher
Danielle Cobbaert	Government
David Langor	Researcher
David Westworth	Consultant
Don Watson	Government
Elizabeth Grilo	Government
Fred Kuzmic	Industry
Haneef Mian	Researcher
Ivan Whitson	Consultant
Jan Ciborowski	Researcher
Jan Volney	Researcher
Jay Woosaree	Researcher
Jennifer Barker	Consultant
Jennifer Grant	ENGO
Jim Herbers	Consultant
John Begg	Government
John Hastie	Industry
Jon Hornung	Industry
Justin Straker	ENGO
Karen Cresine	Industry
Kate Lindsay	Government
Kathryn Bessie	Consultant
Kelly Williams	Government
Kim Young	Consultant
Kyle Harrietha	ENGO
Kyle Jones	Government
Larry Nikiforuk	Consultant
Laura Hickman	Government
Leanne Erickson	Consultant
Len Leskiw	Consultant
Leon Marciak	Consultant
Lori Neufeld	Industry

Name	Org Type
Lynette Esak	Consultant
Margwyn Zacaruk	Industry
Maria Teresa Fernandez de Castro	Researcher
Mel Zweirink	Consultant
Michelle Cotton	Consultant
Mike Morden	Industry
Ralph Dyer	Consultant
Rod Hazewinkel	Government
Ron Lewko	Industry
Paul Martin	Consultant
Ryan Puhlmann	Government
Simon Landhausser	Researcher
Steve Tuttle	Industry
Susy Cote	Consultant
Tanya Richens	Government
Terry Macyk	Researcher
Theo Charette	ENGO
Tim Vinge	Government