Calling Reclamation Practitioners: Draft Alberta Wellsite Certification Guidance Documents

Overview and Technical Q&A

May 5, 2022

InnoTech ALBERTA
A SUBSIDIARY OF ALBERTA INNOVATES

VERTEX

Enviro Q&A Services

NAIT

Outline

- Project Background
- Preparing Variance Justifications for Reclamation Certification of Wellsites and Associated Facilities on Forested Lands
- Certification of Mineral Soil Pads in the Boreal Region - Decision Framework and Support Tools (DSTs)

What's the Problem?

- Certification of upland and peatland wellsites
  - Legacy forested sites that have had natural vegetation establishment
  - Mineral soil pads in peatlands
- Recognized that sites can have developed functioning ecosystems and not require further disturbance/ reclamation to enhance ecological outcomes
- A consistent and standard method to define and address these circumstances is required

Objectives

- Document basis for current industry practices and regulatory decision for legacy sites
- Provide recommendations for an acceptable framework/ decision support tool(s), best practices to enable decisions regarding management and certification of legacy sites

The goal is to ensure that sites are on a trajectory towards functioning ecosystems with an appropriate level of activity

Project Team

VERTEX

Dean MacKenzie
Kevin Renkema
Heather Tokay

InnoTech ALBERTA
A SUBSIDIARY OF ALBERTA INNOVATES

Natalie Shelby-James
Bonnie Drozdowski
Simone Levy

Enviro Q&A Services

Chris Powter

NAIT

Bin Xu
Amanda Schoonmaker

Canadian Natural

Sonia Glubish

cenovus ENERGY

Lisa Warren
Jason Desilets

PADS Project

Alberta Energy Regulator

Nadia Cruickshank

Alberta

Shane Patterson
Susan McGillivary

Project Approach

3 stage project from 2018 to 2022

- Stage 1 – Desktop review
  - Literature and regulatory review
  - Outreach program
- Stage 2 – Site specific reviews
  - Guidance document for upland sites
  - Development of framework/decision support tool(s)
  - Case studies
  - Verification, feedback and revision
- Stage 3 – Research to address knowledge gaps

Stage 1 – Literature Review and Outreach

- Regulatory review of applicable legislation, authorizations, guidelines and policies with emphasis on:
  - Factors affecting ecosystem function for naturally revegetated upland forested sites
  - Factors affecting functional peatland ecosystems
- Reviewed assessment methods outside oil and gas
- Surveyed practitioners, industry & regulators/government

Tokay, H., C.B. Powter, B. Xu, B. Drozdowski, D. MacKenzie and S. Levy, 2019. Evaluation of Reclamation Practices on Upland and Peatland Wellsites. Prepared for the Petroleum Technology Alliance of Canada, Calgary, Alberta. 227 pp.

Drozdowski, B., C.B. Powter, H. Tokay, D. Mackenzie and B. Xu, 2020. Certification of Mineral Pads in the Boreal Region – A Path Forward. Working Session Summary. Prepared for the Petroleum Technology Alliance of Canada, Calgary, Alberta. Report 19-RRC-09_3. 47 pp.

Stage 1 Key Findings – Uplands

- AER approves majority of variance/justifications for reclamation certification
- AEP only involved in decision for an improvement left in place
- Overall there is good support for accepting variance to criteria providing rationale is properly justified (ecologically based)
- Poor quality justification with little back up information will result in rejected application

Approved variance for subsidence and Canada thistle

Stage 1 Key Findings – Pads in Peatlands

- Multiple government agencies involved in each decision:
  - Requires approval from **AEP** (effectively the "landowner") for a change in land use request
  - With this approval, **AER** certifies the site *if* it meets forested criteria (vegetation override)

Pads left in place with forest cover

Stage 1 Key Findings – Pads in Peatlands

- Ultimately there is a lack of clarity on the ***process*** to obtain approvals and the ***criteria*** for evaluating the requests
  - Likely why we found a diverse range in responses to leaving pads in place

Offsite impacts from access road pad material

Stage 2 – Divergent Paths Forward

Forested Upland Sites

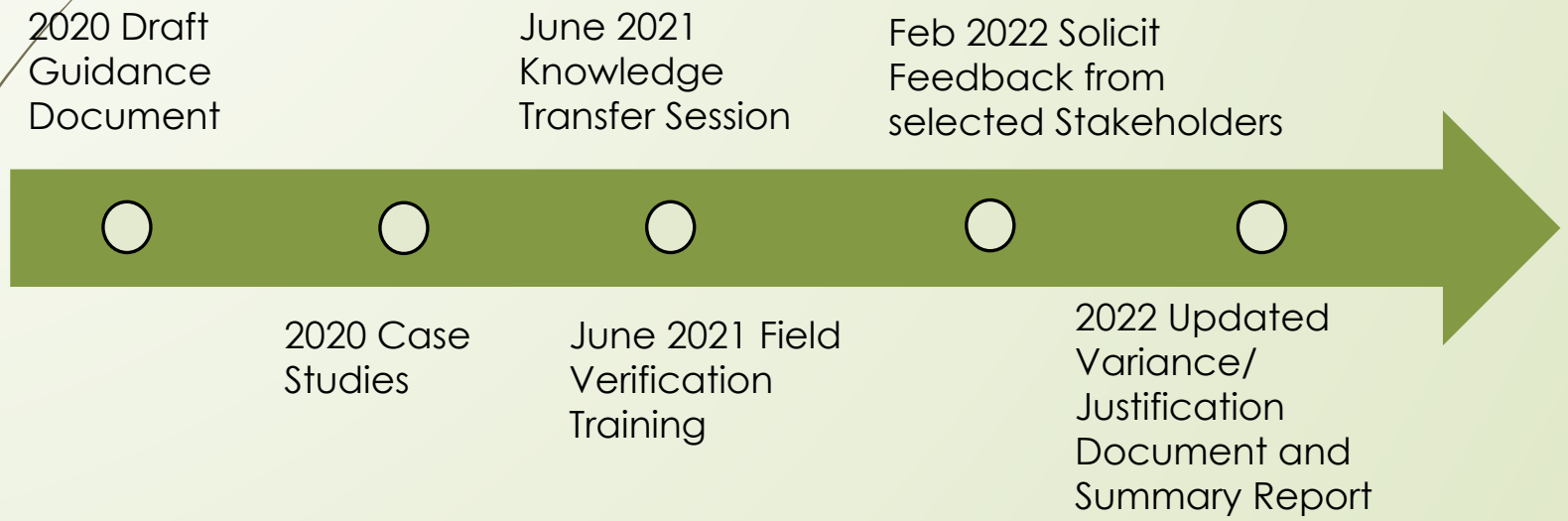
- Preparation of complete and comprehensive variance requests to streamline for rec cert applications under **Forested Criteria**
- Emphasis on achieving best possible ecological outcomes (net environmental benefits)
- Detailed information for common variances (Landscape – cut/fill, subsidence; woody debris; Soils – topsoil depth/distribution; Vegetation – weeds, species)

Forested Pad within a Peatland

- Decision support tool(s) for:
  - Considerations to assess ***when*** it would be ***acceptable*** for a mineral pad to remain in place (including the ecological cost/benefits of removal)
  - ***Acceptable site conditions*** to ***meet ELC*** and Rec Cert applications (including deficiencies for Forested Criteria)
  - ***Process*** (i.e., Land Use Change) recommendations

Document Development Process

- 128 people participated in knowledge transfer session
- Solicited selected industry, regulatory and practitioner feedback to improve original draft(35 industry/practitioner and 18 AEP and AER)
- Twenty-nine nominated sites for verification trial



PREPARING VARIANCE JUSTIFICATIONS FOR RECLAMATION CERTIFICATION OF WELLSITES AND ASSOCIATED FACILITIES ON FORESTED LAND

2022 UPDATE

Heather Tokay, Kevin Renkema, and Dean MacKenzie, Vertex Professional Services Ltd.

Chris Powter, Enviro Q&A Services

Bonnie Drozdowski, InnoTech Alberta Inc.

REPORT PREPARED FOR
PETROLEUM TECHNOLOGY ALLIANCE CANADA
Reclamation Remediation Research Committee

CONFIDENTIAL

20– RRRC – 05_3b

April 2022

Preparing Variance Justifications

- Second version of the document
- Revised based on stakeholder feedback from 2021 and 2022
- Key changes include:
  - New Title
  - List of Caveats (Section 1.2)
  - Section 3.0 to emphasize achieving best possible ecological outcome (net environmental benefit)
  - Justification form to reduce redundancy and focus on key information to include

Updated Document

- Section 1.0 – Purpose and Introduction
- Section 2.0 – Overview of rec cert application process
- Section 3.0 – Considerations prior to proceeding with a variance request
  - Alternatives to variance request/net environmental benefit
- Section 4.0 – Preparing professional justifications (overview of how to fill out proposed justification form)

Updated Document

- Appendix A – Detailed information on common deficiencies
- Appendix B – Checklist for common deficiencies
- Appendix C – Additional information
- Appendix D – Variance justification form

Use and Caveats

Document is intended to support preparation of **complete and comprehensive variance requests** to allow for consistent decisions resulting in the **best possible ecological outcomes**

- Variance requests should be avoided by using all possible reclamation techniques used to meet forested land criteria
- Following this document does not guarantee approval of variance
- Information from this document must not be copied and pasted – site specific information is required
- This document does not contain regulatory guidance and does not replace the current SED 002 submission requirements

Net Environmental Benefit

- **Gains in value of environmental services or other ecological properties attained by remediation or [reclamation] minus the value of adverse environmental effects caused by [reclamation] (Efroymson et al., 2004).**
  - Consider alternatives to justification – full site reclamation, partial or small-scale (hand) reclamation
  - If determined that justification results in net environmental benefit, only then should a variance request be submitted
  - Considered at a decades timeframe not a few years

Preparing Justifications

Summarize:

- relevant background information,
- rationale or evidence that a variance request will result in the best ecological outcome,
- explanation of why the deficiency is not expected to have adverse environmental impacts, and
- demonstration of equivalent land capability and ecosystem




Preparing Justifications

Recommended to Include:

- Detailed description of the deficiency
- Pre-existing/pre-disturbance biophysical information
- Surrounding area land use and biophysical information
- Construction/reclamation limitations
- Actions taken to address deficiency
- Alternatives to justification considered
- Annual monitoring results
- Limitations or hazards caused by deficiency
- Photographs

Professional Justification

Facility(ies):
Deficiency Type(s):
Description of Deficiency (including location and extent/dimensions of the deficiency)
Pre-existing Conditions and Pre-disturbance Biophysical Information (summarize causal factors/natural analogs)
Surrounding Area - Land Use(s) and Biophysical Description (summarize causal factors/natural analogs)
Construction/Reclamation Limitations (summarize causal factors – e.g. soil salvage/replacement limitations)
Actions Taken to Address Deficiency (e.g. low-impact reclamation work, herbicide application)
Alternatives to Justification Considered
Annual Monitoring Results (e.g. current state of the site, vegetation trajectory, trends in weed population size)
Limitations or Hazards Caused by Deficiency
Rationale for Variance (summary of all available information and demonstrate equivalent land capability)

Information Sheets

- Subsided areas
- Hill cuts
- Soil stockpiles
- Woody debris piles
- Topsoil depth and distribution
- Sparse desirable herbaceous vegetation cover
- Problematic vegetation

Each of the 'Information Sheets' presents a single deficiency and the factors that may be used to justify a variance request

SUBSIDED AREAS

Before proceeding through this Information Sheet, refer to Sections 1 and 3. Variances should only be used if they result in the best possible ecological outcome.

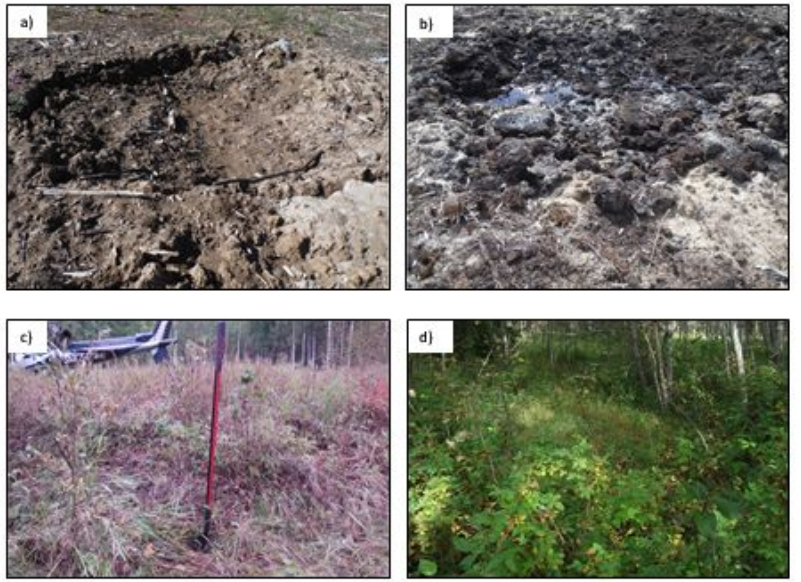


Figure 1. Examples of subsided areas. Requirements and factors presented in this Information Sheet are used to determine if these are eligible to be left in place.
a) and b) before vegetation encroachment; c) and d) after vegetation encroachment.

Subsidence is defined as "lowering of the soil surface due to a reduction in volume through settling or other means" (Powter, 2002) and occurs in localized areas where soil settling occurs unevenly (e.g., at well centre, or in association with cut and fill construction practices). Subsidence may result from settling of uncompacted fill materials, improper fill material placement during reclamation and/or the presence of snow mixed in with fill materials. Subsided areas (Figure 1) form as the result of subsidence; the amount of time over which a subsided area may continue to subside (i.e., becoming deeper or

Forested Upland Sites

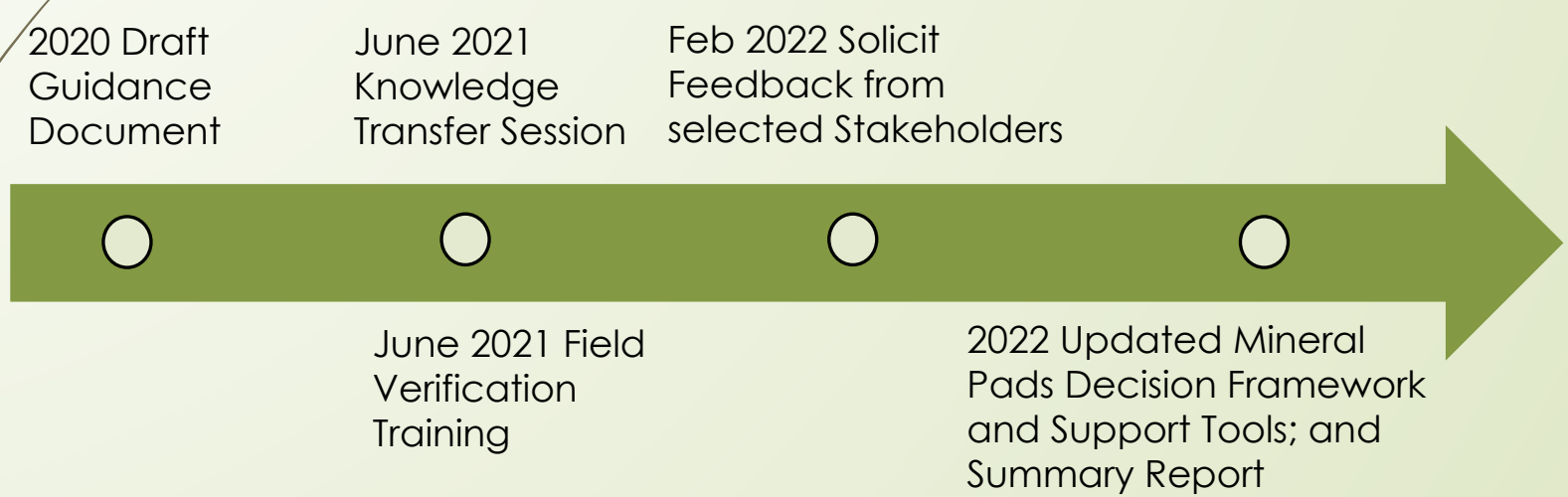
- Preparation of complete and comprehensive variance requests to streamline for rec cert applications under **Forested Criteria**
- Emphasis on achieving best possible ecological outcomes (net environmental benefits)
- Detailed information for common variances (Landscape – cut/fill, subsidence; woody debris; Soils – topsoil depth/distribution; Vegetation – weeds, species)

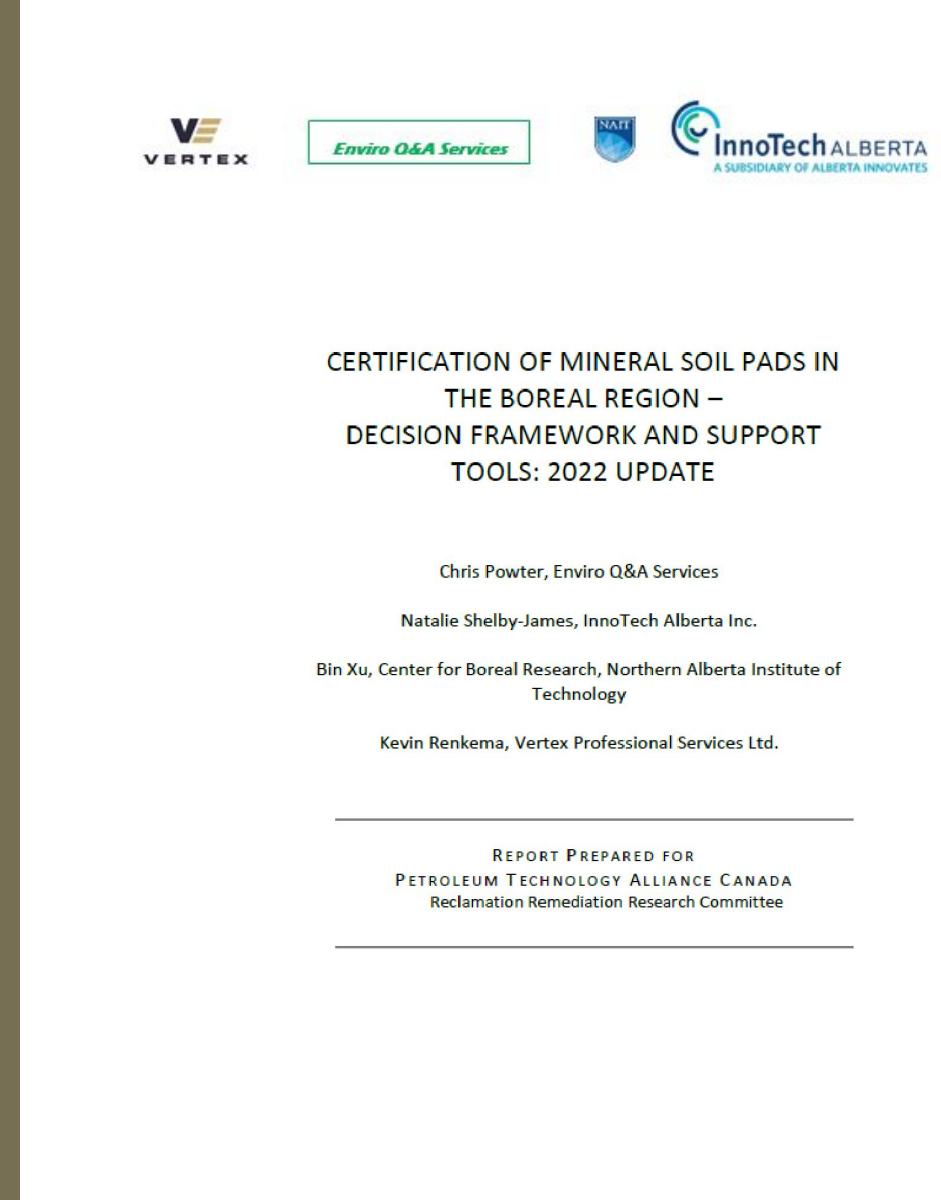
Forested Pad within a Peatland

- Decision support tool(s) for:
  - Considerations to assess ***when*** it would be ***acceptable*** for a mineral pad to remain in place (including the ecological cost/benefits of removal)
  - ***Acceptable site conditions*** to ***meet ELC*** and Rec Cert applications (including deficiencies for Forested Criteria)
  - ***Process*** (i.e., Land Use Change) recommendations

Document Development Process

- 128 people participated in knowledge transfer session
- Workshops with selected industry, regulatory and practitioner was help to solicit feedback (35 industry/practitioner and 18 AEP and AER)
- 122 nominated sites for verification trial





Decision Framework and Support Tools

- Second version of the document
- Revised based on stakeholder feedback from 2021 and 2022
- Key changes include:
  - List of caveats
  - Pre-screening tool
  - Added detailed description(terminology and explanation) to decision framework and support tools
  - Updated tables and support tools
  - Added section on back up documentation required

Use and Caveats

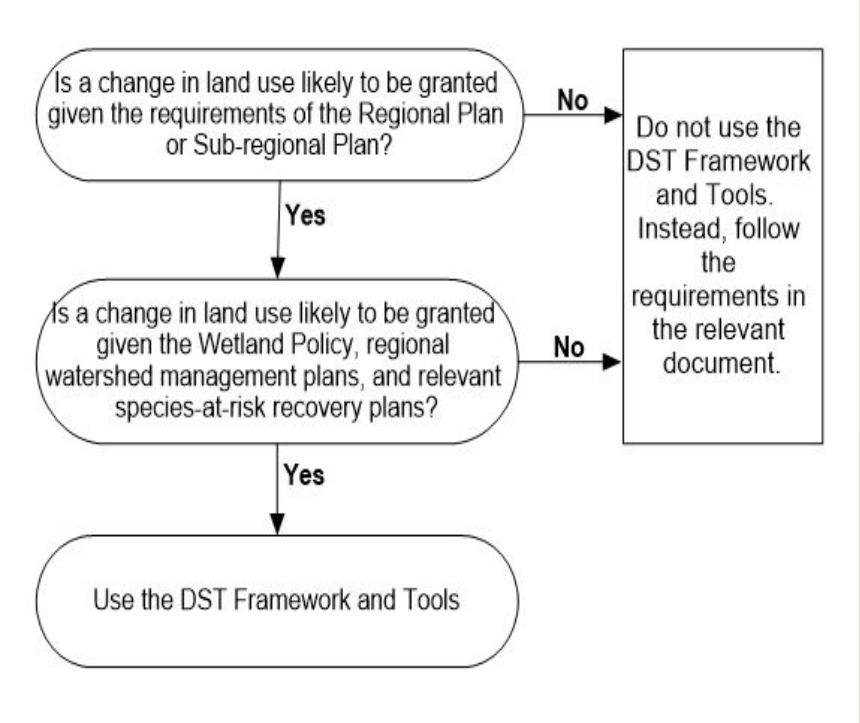
Reclaim to peatland
>
Reclaim part of pad/access to peatland
>
Reclaim to upland

Change in land use applications should only be submitted after careful review of reclamation options

- Consider if partial or full reclamation will result in better outcomes even if sets site back several years
- Following this document does not guarantee acceptance in change in land use or reclamation certificate – document provides recommendations not decisions
- Approval may require conditions for additional work
- This document does not contain regulatory guidance

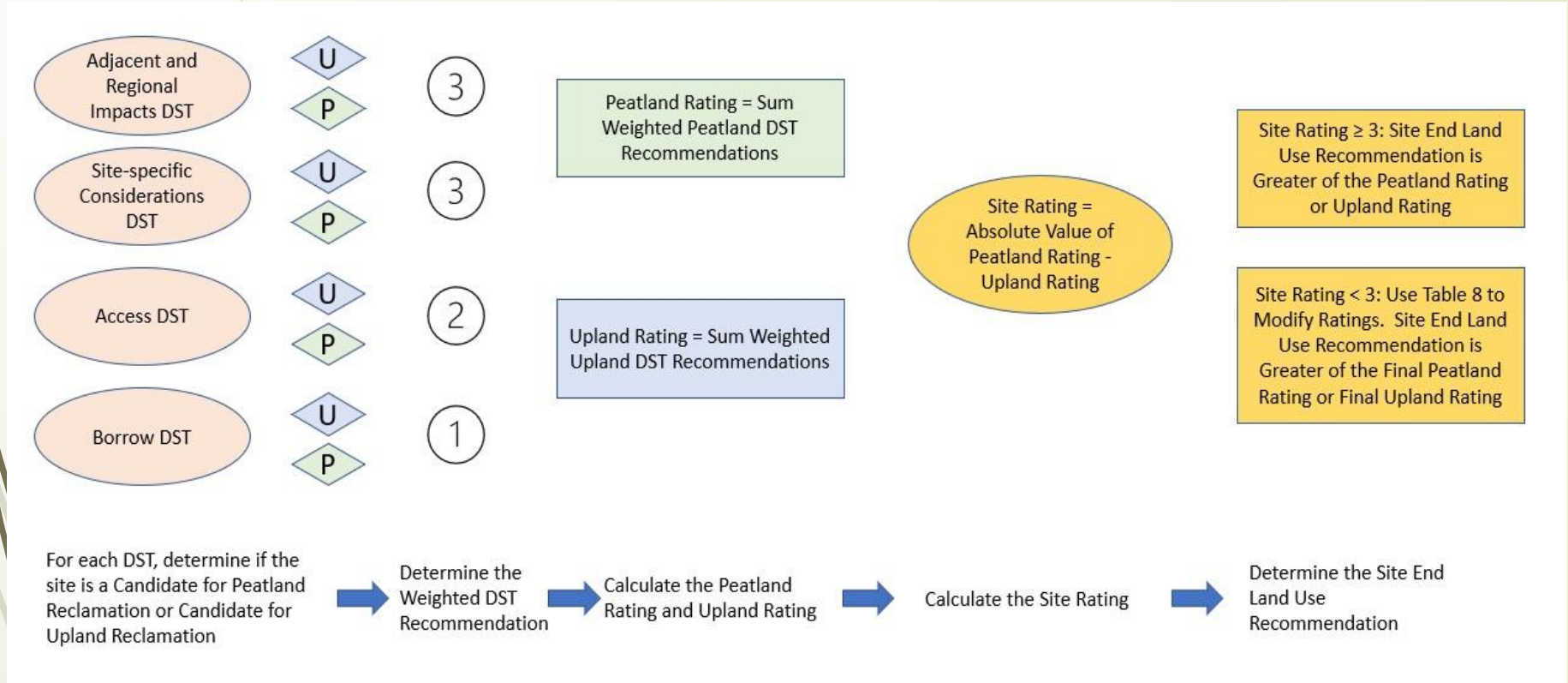
Decision Framework – Screening Tool

- Provides a process to decide if the DST should be used
- Provides supporting information for the request to AEP for the change in land use (usually referred to as a justification, or professional judgement; Alberta Environment and Parks, 2017).



Decision Framework

- Framework consists of 4 decision support tools

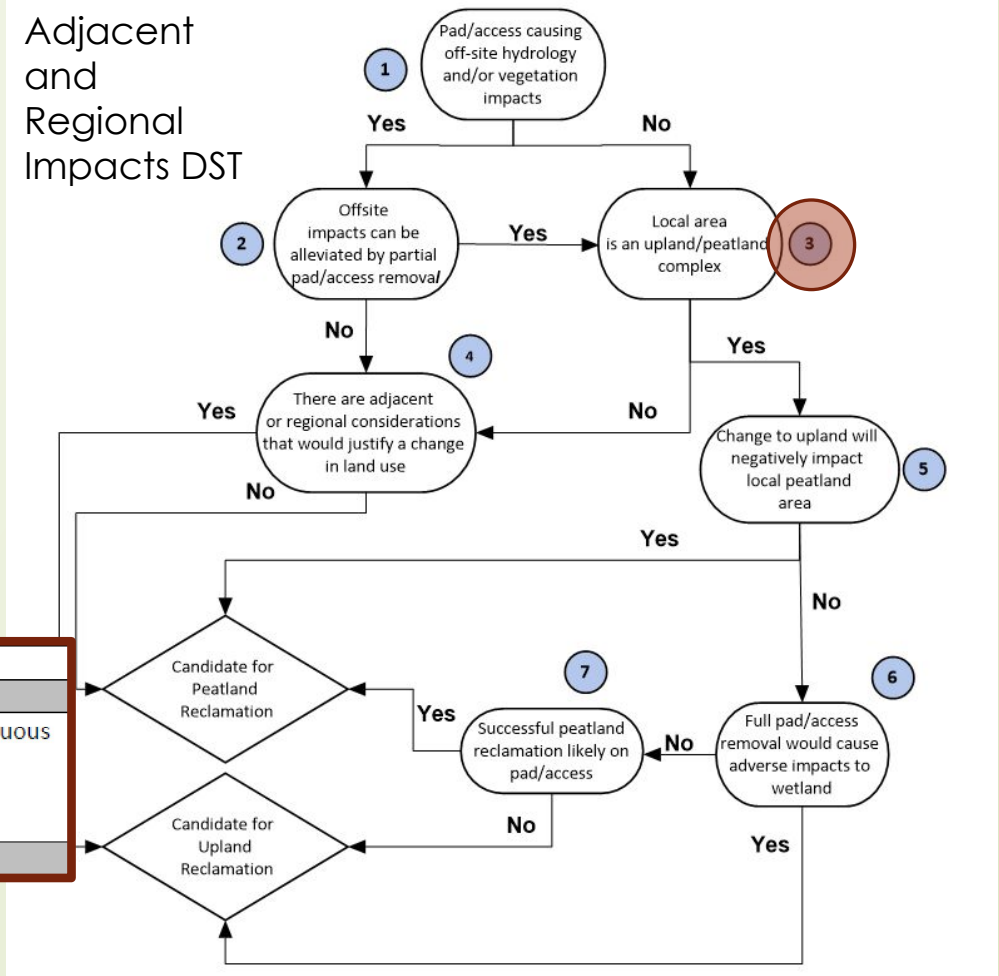


Decision Support Tool – Close up

- Glossary for each support tool
- Decision flow chart
- Supporting table describing additional factors when answering yes or no
- List of research gaps

Factor	Yes	No
3: Is the local area in an upland/peatland complex?		
Peatland/upland composition	Local area is a mosaic of upland forests, bogs and fens OR a transitional area between upland and peatland	Local area is a large, continuous fen or bog
4: Are there adjacent/regional considerations that would justify a change in land use?		

Adjacent and Regional Impacts DST



Example Calculation

- Where the Site Rating is ≥3 the final site end land use recommendation is the greater of the Peatland Rating or the Upland Rating
- Modify peatland and upland ratings when site rating is <3

Decision Support Tool*	Candidate for Peatland Reclamation	Candidate for Upland Reclamation	Candidate for Peatland Reclamation	Candidate for Upland Reclamation
	Site 1		Site 2	
Adjacent and Regional Impacts	3		3	
Site-specific Considerations		3		3
Access	2			2
Borrow		1		1
Peatland Rating	5		3	
Upland Rating		4		6
Site Rating [Peatland Rating – Upland Rating]	1		3	

Example Calculation

- Table 8. Modifications to the Initial Site Rating
- All factors must be assessed

Factor [1]	Modification to Peatland Rating	Modification to Upland Rating
More than two variances will be required for pad/access to be certified under the Forested Land Criteria	+1	
Dugout borrow is a shallow open water wetland	+1	
Small portion of well pad is in peatland		+1
Access/pad being used by third parties or wildlife		+1
Desirable trees / woody species are at least 8 years old AND meeting growth expectations		+1

Recommended Information to Provide in Support of Change in Land Use Application

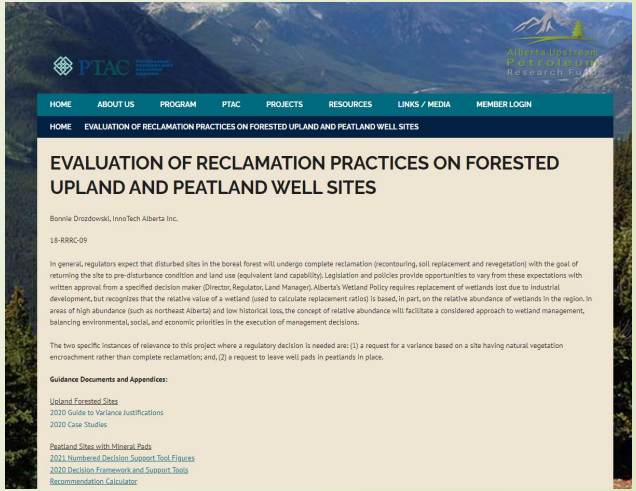
- Rationale for not removing pad
- Site background information
- Results from DST recommendation calculator
- Adjacent and regional DST information
- Site specific considerations DST information
- Access DST information
- Borrow DST information
- Additional supporting information

Next Steps & Where to Find Documents

- Need additional field trials and feedback on both documents
- PTAC will post future announcements including revised documents

Renkema, K., H. Tokay, D. MacKenzie, N. Shelby-James and C.B. Powter. 2022. *Guide to Variance Justifications for Reclamation Certification of Wellsites and Associated Facilities: Stakeholder Review and Field Verification*. Prepared for the Petroleum Technology Alliance of Canada, Calgary, Alberta. Report 20 – RRRC – 05_3a. 47 pp.

Powter, C.B., N. Shelby-James, B. Xu and K. Renkema, 2022. Certification of Mineral Soil Pads in the Boreal Region – Decision Framework and Support Tools: 2022 Update. Prepared for the Petroleum Technology Alliance of Canada, Calgary, Alberta. Report 19-RRRC-09_4. 35 pp.



https://auprf.ptac.org/evaluation-of-reclamation-practices-on-forested-upland-and-peatland-well-sites-2/

Thank you

Dean MacKenzie

Vice President – Environment

Vertex Resource Group Ltd.
ph. 780-668-4519
e-mail: dmackenzie@vertex.ca

Natalie Shelby Jaimes

Sr. Researcher – Environmental Impacts

InnoTech Alberta
ph. 587-777-0101
e-mail: Natalie.Shelby-James@innotechalberta.ca

Acknowledgements

- **PTAC – Tannis Such, Lorie Mayes, Lauren Arthur**
- **RRRC and Technical Steering Committee**
- **AEP participation**
- **AER participation**
- **Enviro Q&A Services – Chris Powter**
- **Vertex – Kevin Renkema and Heather Tokay**
- **NAIT – Bin Xu**
- **InnoTech – Simone Levy & Bonnie Drozdowski**

Everyone who has participated in the consultation process and workshops