

Application Submission Requirements and Guidance for Reclamation Certificates for Well Sites and Associated Facilities

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Specified Enactment Direction 002: Application Submission Requirements and Guidance for
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1 Introduction

The Alberta Energy Regulator (AER) regulates energy resource activities as mandated by the *Responsible Energy Development Act (REDA)*. On March 29, 2014, the AER began accepting energy-related reclamation certificate applications under the *Environmental Protection and Enhancement Act (EPEA)*, as announced in *AER Bulletin 2014-08: AER Implementation Phase 3*.

Specified Enactment Direction 002: Application Submission Requirements and Guidance for Reclamation Certificates for Well Sites and Associated Facilities (SED 002) sets out the information requirements for reclamation certificate applications for upstream oil and gas operations, including associated facilities and pipelines under *EPEA*. This SED also provides guidance on how to comply with these requirements.

SED 002, which is in effect as of June 21, 2016, replaces and supersedes the Government of Alberta *2010 Reclamation Criteria for Wellsites and Associated Facilities: Application Guidelines*.

The reclamation certificate application requirements that were in the 2010 guidelines have not changed; however, the application submission process has been enhanced by the AER through an on-line submission system.¹ Consequently, some of the requirements have been restructured or consolidated to align with the on-line system.

This SED has been arranged as follows: Section 2 provides an overview of the regulatory framework for reclamation and the AER's role within it. Section 3 on provides important information for oil and gas operators applying for a reclamation certificate.

2 Regulatory Overview

2.1 Requirements

The AER is responsible for ensuring that land used for energy resource activities is reclaimed in an environmentally sound manner. This is directed under *EPEA* and the *Conservation and Reclamation Regulation (CRR)*. Under *EPEA*, after an upstream oil and gas facility has been decommissioned, operators must apply for a reclamation certificate.

Section 137 of *EPEA* sets out the requirement for an operator to conserve and to reclaim specified land,² which includes obtaining a reclamation certificate unless exempted by the *CRR*. Operators need to make sure that activities undertaken during the various project phases (e.g., construction, operation) are appropriate for ensuring that disturbed areas (see 3.3.1 below) will be reclaimed to an “equivalent land capability” as defined in the *CRR*. Reclamation certification is assessed against *EPEA*, *CRR*, *EPEA* approval terms and conditions, and other applicable regulatory requirements, including directions set by the AER.

¹ Available on the [AER website](#) through the Systems & Tools portal > Reclamation Certificate Application Tool.

² As defined under the *CRR*.

Section 138 of *EPEA* outlines that an application for a reclamation certificate must be made to the AER in accordance with the regulations. Regarding what a reclamation certificate application must contain, section 12(1) of the *CRR* states the following:

12(1) An application for a reclamation certificate must

- (a) contain the information in respect of the specified land that is required in a form provided by the Director for that purpose, or
- (b) contain the following information in respect of the specified land, where the Director does not provide a form under clause (a):...

This SED sets out the information required for a reclamation certificate application, submitted using the AER's on-line submission system, and guidance on how to adequately prepare the application.

The Government of Alberta, through Alberta Environment and Parks (EP), retains the responsibility to establish and set the reclamation standards, criteria, and guidelines for conservation and reclamation of specified land. The AER will review reclamation applications against the current standards, criteria, and guidelines to ensure that outcomes have been achieved. The current reclamation criteria are the *2010 Reclamation Criteria for Wellsites and Associated Facilities for Cultivated Lands, Forested Lands and Native Grasslands* and the *Reclamation Criteria for Wellsites and Associated Facilities for Peatlands*.

2.2 Regulatory Process and Decisions

Once the AER receives an application for a reclamation certification, a public notice of application is posted on the AER website, www.aer.ca. The AER expects the operator to provide a copy of the notice of application to landowners and occupants. A statement of concern on the application can be filed with the AER. The EnerFAQs *Expressing Your Concerns – How to File a Statement of Concern About an Energy Resource Project*, available on the AER website, provides information about how to file a statement of concern.

In accordance with section 33 of *REDA* and the *Alberta Energy Regulator Rules of Practice*, once the AER makes a decision on an application for a reclamation certificate, notice of the decision is provided to the operator, the registered owner of the land that was certified reclaimed, and any person whom the AER considers to have been directly and adversely affected by the prior activity on the land that was certified.

Under *REDA*, an eligible person may appeal decisions that meet certain criteria. “Eligible person” and “appealable decision” are defined in section 36 of *REDA* and section 3.1 of the *Responsible Energy Development Act General Regulation*. A request for regulatory appeal must be submitted in accordance with the AER's requirements. Filing requirements and forms can be found on the AER website under Applications & Notices > Appeals.

For reclamation certificate applications, the AER has two levels of review:

- **Baseline**—The baseline review ensures that the application is complete. All applications go through this process, and a notice of application is posted for 30 days. If no statements of concern are received, then the certificate will be automatically issued after the 30-day period.
- **Additional review**—Applications that have unresolved landowner complaints, filed statements of concern, requests for variances from the standard criteria that have not been preapproved by the AER, or are more complex are sent for additional review. AER staff will undertake a more detailed review of the application, which may include conducting field inspections, before issuing a decision.

The on-line submission system assigns applications to the applicable stream based on assessment rules, available on the AER website under [Reclamation & Remediation > Reclamation > Reclamation Certificate Application & Submissions](#).

2.3 Environmental Assurance Following Certification

The AER conducts audits of certified sites to verify compliance with legislation, standards, criteria, guidelines, and policy. Audits are separate from the complaint process. Sites are either randomly selected for audit or targeted for audit based on risk. Audit types include the following:

- 1) **Desktop audit**—This type of audit is to ensure that the correct information was available to support reclamation certification. Any risk factors identified may result in a more comprehensive desktop audit. This may include a review of the Phase 1 environmental site assessment (ESA), Phase 2 ESA, Phase 3 ESA, or the detailed site assessment. Based on the findings from the desktop audit, a certified site may be sent for a surface or subsurface field audit.
- 2) **Surface reclamation field audit**—This type of audit includes a file review and site visit to assess if the site is compliant with the criteria. The assessment includes vegetation quality and quantity, soil quality and quantity, site topography and landscape, evidence of remaining facilities, visual indicators of contamination, and any other parameters identified by the landowner or flagged by the desktop audit or in a statement of concern.
- 3) **Subsurface contamination field audit**—This type of audit includes a file review and site visit to collect soil samples for lab analyses. At some sites, electromagnetic survey and groundwater sampling may also be included.

Certificates may be upheld or cancelled at any audit step. Reasons for cancellations may include

- application was incomplete and inaccurate or contained inconsistent information,
- the site was not assessed for contamination where required, or
- the site was not compliant with the remediation guidelines or reclamation criteria and no adequate justification was provided within the application.

3 Application Submission Requirements

This section describes what information needs to be included in the reclamation certificate application.

The application is available through the AER Digital Data Submission (DDS) system on the AER website. The *Reclamation Certificate Application Tool: User Guide* explains how to use the on-line tool to submit the application.

The on-line submission technology was built around the AER's approach to regulating energy development in an efficient and effective manner and was founded on five main principles: integrated decision-making, standard risk-based process, life-cycle approach, performance monitoring, and communication. The AER approach to energy-development activities considers all aspects of development, from initiation and construction through to operation and closure.

3.1 Asset Information

Common authorized assets include wells, facilities, and pipelines, and dispositions and registrations for compressor stations and sweet gas plants. Common associated facilities and infrastructure may include access roads, log decks, remote sumps, campsites, borrow pits, or land treatment areas.

3.2 Assets

In the on-line submission system, all AER-authorized activities located on the specified lands to be certified will be listed in the asset table.

3.2.1 Asset/Authorization Reference Number

In the geographic information system (GIS) map, when selecting assets to be certified, certain information will be prepopulated into the application screens. The AER authorization number for all assets (e.g., the well, facility, or pipeline licence number) is required. Be sure to include the public land disposition number or the *EPEA* code of practice registration number for compressor stations and sweet gas plants.

Prepopulated information cannot be edited through the on-line submission system. Any discrepancy must be corrected at the data source. For example, if a well has been abandoned but the well licence status is not "surface abandoned," the applicant must submit the surface abandonment information data through the DDS system before submitting the reclamation certificate application.

3.2.2 Primary Asset

A primary asset must be identified from the list of assets. Generally, the primary asset is the well or any physical asset for which the reclamation certification is being requested. The primary asset will be used to prepopulate fields in the site information tab. In some cases, the area being reclaimed will not have a licensed asset.

3.2.3 Activity Type

Activities covered under upstream oil and gas can fall under several categories, including the following:

- prepared well site (built not drilled)—site where soil was salvaged and preparation for drilling was completed, but drilling at the site did not occur.
- drilled and abandoned well site—site that was drilled, never put into production, and abandoned.
- oil well site—site with well “that produces primarily liquid hydrocarbons from a pool or portion of a pool” (*Oil and Gas Conservation Rules*, section 1.020(12)(i)).
- sweet gas well site—site with well producing natural gas that does not need to be purified to remove sulphur-bearing compounds such as hydrogen sulphide (H₂S).
- sour gas well site—well producing natural gas that contains measurable amounts of H₂S.
- coal exploration program (CEP)—a site used for coal exploration activities regulated under the *Code of Practice for Exploration Operations*. On public lands, these are dispositioned as CEP.
- oil sands exploration (OSE) program—a site used for oil sands exploration activities regulated under the *Code of Practice for Exploration Operations*. On public lands, these are dispositioned as OSE.
- disposal well—site with a well used for injecting fluids for purposes other than enhanced recovery or gas storage.
- battery site—a site with “a system or arrangement of tanks or other surface equipment, together with associated infrastructure, for receiving or holding the effluent of one or more wells” (*CCR*, section 1(b)).

It is possible that a well that originally produced one type of resource switches to producing another type of resource during its life (e.g., producing oil well from 1981 to 1986, producing gas well 1986 to 1988, injection well from 1988 to 1991). The current activity type of a well must be identified in the application form. If production on a well changes, all activity types conducted on the lease during the history of the well must be identified and a more detailed history must be provided in the Phase 1 ESA section (attach additional pages as necessary).

For well sites that have not been entered (surveyed only), a reclamation certificate is not required as the land has not been entered or used in any way and is therefore not considered specified land. For sites located on public land, an application for “no entry” is required to cancel the disposition.

No entry means that the land has not been used **in any way, even for a temporary purpose**, for construction, operation, or reclamation of a well site.

The on-line submission system for reclamation certificates cannot be used for submitting a no-entry application.

3.3 Associated Activities

Any facilities and infrastructure associated with an asset require a reclamation certificate and must be included in the reclamation certificate application for the well site. Associated facilities and infrastructure may include

- access roads,
- temporary access roads,
- pipelines,
- temporary work space,
- borrow site,
- campsite,
- remote sump,
- remote cement return pit,
- log deck / storage area, or
- land treatment area.

Single remote sumps and land treatment areas must be included in the application for the affiliated well site. Multiwell sumps must be tied to one of the well sites that contributed drilling waste to the sump.

When applying for a reclamation certificate for an associated facility or infrastructure, it is important to complete all applicable assessments. For example, a land treatment facility or a remote sump will require the same information and level of detail as a well site, including a Phase 1 ESA or compliance option checklist for drilling waste disposal, a detailed site assessment completed in accordance with the reclamation criteria, and if applicable, a Phase 2 ESA. If images of the well site do not capture the associated facility, a separate image of the associated facility must be provided (e.g., aerial, satellite, and site photos). See section 10.6 for further information.

Pipelines are associated infrastructure (as are remote sumps, batteries, etc.) since they are used in connection with the operation of the well and therefore are considered an integral part of the well for reclamation certification purposes.

If the associated facility or infrastructure is located away from the well site and is not covered on the survey plan, a separate survey plan of the associated facility or infrastructure must be submitted if available. If a survey plan for the associated facility or infrastructure is not available, the following must be provided:

- a detailed and accurate drawing, including facility or infrastructure dimensions; and
- distances in relation to the quarter section or legal boundaries and other features such as roads, buildings, or water bodies.

On public land, all facilities or infrastructure approved through the Enhanced Approval Process and documented in Schedule D or historically documented in the environmental field report must be acknowledged in the application and assessed as required. Documentation indicating if the facilities or infrastructure was used and reclaimed, prepared but not drilled, or not used at all must be submitted in the application package.

To ensure that operators have all available historical information about a site and its associated facilities and infrastructure, the AER offers a search service of its files. Submit an information request, as outlined at www1.aer.ca/ProductCatalogue/ordering.html, to InformationRequest@er.ca. The AER strongly encourages requesting the information well in advance. A fee may be charged for the service.

3.3.1 Construction Practice (Degree of Disturbance)

Operators are legally responsible for the reclamation of specified land, which means any and all land that is being or has been used or held for or in connection with the construction, operation, or reclamation of a well or battery, among other things. Operators must clearly indicate what areas of the site have been disturbed and to what extent, however minor.

Operators must provide information on the type of access built and used in order to access the site. Trails or roads where soil was not stripped may still be affected by traffic causing compaction.

Disturbed areas: Areas of the lease or access that have undergone soil disturbance (e.g., stripping or storage and including points like well centre and flare pits and longitudinal effects like ruts). In some minimum or zero disturbance cases (e.g., soils that were not frozen), even though soil was not stripped, traffic may have caused compaction, pulverized soil, rutting, or clodding to the extent that the native community (i.e., species and/or layers) has been altered or removed.

Operators must indicate whether the site has experienced full disturbance, minimum disturbance, zero disturbance, or staged/progressive reclamation, defined as follows:

- **Full disturbance:** Site where the soil has been disturbed across the entire site.
- **Minimum disturbance:** Site where construction practices were used that minimized the level of disturbance on the lease resulting in two different management zones (i.e., undisturbed and disturbed).
- **Zero disturbance:** Site that has had no soil disturbances (e.g., stripping, compaction [such as due to equipment storage], or rutting).
- **Staged/progressive reclamation:** Site with areas that have been previously reclaimed following construction (i.e., areas outside of the teardrop). These areas must not have been redisturbed during the final reclamation in order to qualify for a different reclamation date, as per the criteria.

3.4 Related Submission

The on-line system will access previously submitted information related to the assets for which a reclamation certificate is being applied.

Examples of related submissions include

- Phase 1 ESA,
- drilling waste disposal information,
- Phase 2 ESA,
- Phase 3 ESA (remediation report), and
- variance requests (professional justification).

A reclamation certificate application that includes a variance request in response to assessment parameters failing to meet the applicable criteria or guidelines may still be submitted if the application is accompanied by professional justification. Professional justification may be submitted for regulatory approval prior to applying for a reclamation certificate. Reclamation certificate applications containing professional justification for failed parameters will result in additional review by the AER unless approval of the variance is provided before application submission.

3.5 Disposition Cancellation for Public Lands

Indicate whether the public land disposition should be cancelled upon issuance of a reclamation certificate. A disposition will not be cancelled in the event of partial reclamation certification. Refer to section 2.5.2.

4 Site Information

4.1 Jurisdiction

There are several administrative jurisdictions within the province. These include public lands, parks and protected areas, special areas, and private lands.

If the site or some of the associated facilities cross multiple jurisdictions, check the appropriate boxes.

The AER issues reclamation certificates for sites where the right of entry is administered under the *Surface Rights Act* for both private and public land.

4.1.1 Public Land

Public land is Crown land administered under the *Public Lands Act*.

For public lands within Special Area No. 2, 3, or 4, the landowner is considered the Special Areas Board and all other parties are considered the occupant.

The applicant must provide proof of application delivery to all applicable occupants (grazing reserve or grazing leaseholder).

Note: Do not send EP or AER regional offices or field centres copies of the application package unless they are listed as the managers of the grazing reserve.

4.1.2 Parks and Protected Areas – Alberta Environment and Parks

Parks and protected areas are Crown lands administered under the *Provincial Parks Act*, *Wilderness Areas*, *Ecological Reserves*, *Natural Areas and Heritage Rangelands Act*, and *Willmore Wilderness Park Act*.

To identify which category of protected area, check the *Land Reference Manual* on the Alberta Parks Division website.

EP's Parks Division staff must be contacted prior to developing the reclamation plan to determine the desired end state for the reclamation within the park or protected area (e.g. natural state versus perennial park facility development).

The applicant must send a copy of the application to ppa.referrals@gov.ab.ca or to Parks Land Use and Dispositions, 2nd Floor, Oxbridge Place, 9820 – 106 Street, Edmonton, AB T5K 2J6.

Sites located within the jurisdiction of Alberta Parks will require a site visit by Parks Division staff to ensure compliance with Parks Division's approval conditions. Therefore, the 30-day preapplication submission requirement may be extended at the request of Parks Division staff.

4.1.3 Special Area 2, 3, or 4 – Special Areas Board

Special Areas is Crown land administered under the *Special Areas Act* and *Public Lands Act* within Special Area 2, 3, or 4.

The applicant must provide proof of application delivery to the Special Areas Board and the occupant.

4.1.4 Private Land

Private land is primarily governed by the *Municipal Government Act*. Private land includes land administered by municipal governments, Métis settlements, and land privately owned.

The applicant must provide proof of application delivery to landowners, designates, and occupants.

If the site is located in a Métis settlement, the applicant must complete a registry search and maintain a record of contact and discussion with landowners and occupants, as well as provide a copy of the application to the settlement office and the landowners and occupants.

4.2 Site Identification

Site identification refers to the physical location and size of the site for which the reclamation certificate application is being applied.

4.2.1 County / Municipal District / Improvement District / Special Area

Identify the county, municipal district, improvement district, or special area on which the primary asset is located.

4.2.2 Total Land to Be Certified (Hectares or Acres)

Identify the entire area to be certified, including all associated facilities and infrastructure that are being certified in conjunction with the application.

4.2.3 Total Wetland Disturbed and Area Reclaimed to Wetland

Include the area of the wetland disturbed and the area that was reclaimed to a wetland. This information needs to align with the *Alberta Wetland Policy*.

4.2.4 Legal Land Description

Provide all surface legal land descriptions for the site. Include the surface locations for the assets and the associated facilities or infrastructure that are being certified.

4.3 Additional Certificates

Other certificates (e.g., reclamation or remediation) may have been issued for the well site or associated facilities or infrastructure. If this is the case, provide the certificate number and date in the application package. The Environmental Site Assessment Repository (ESAR) (www.esar.alberta.ca) can be searched to determine whether EP has previously issued a reclamation certificate for the site. ESAR may not contain reclamation certificates for sites on public land issued by EP. For sites on public land and certificates issued by the AER, contact [InformationRequest@aer.ca](mailto:InformationRequest@ aer.ca).

If a reclamation certificate has been previously issued, the current application should provide all required documentation and information for the area disturbed by the new activity. Any cumulative reclamation or remediation impacts due to the overlapping activities must be addressed in this application.

4.4 Previously Refused Applications or Cancelled Certificate

Applications may have been refused or cancelled for administrative reasons (incomplete application) or technical reasons (deficient reclamation). If a previously submitted application was deficient or contained contradictory information, operators must provide detailed information on how the deficiencies noted in the previous application were corrected, including the work conducted at the site and results of site assessments.

Operators must exercise due diligence in finding the appropriate files and checking with all available information sources. ESAR can be searched to determine whether EP has previously cancelled a reclamation certificate or refused a reclamation certificate application for the site or a portion of the site. For sites on public land and applications refused by the AER, inquiries can be made to [InformationRequest@aer.ca](mailto:InformationRequest@ aer.ca).

4.5 Partial Reclamation or Overlapping Exemption

When a portion of the site is overlapped by another activity and the remaining site is certified, this is considered partial reclamation if on public land. On private land, it is referred to as an overlapping exemption.

4.5.1 Partial Reclamation Certification on Public Land

Pipelines: Pipelines that end at the well site or edge of the well site lease are considered “dead ended” and must be reclaimed and certified as part of the well. Such pipelines are associated infrastructure as they are used in connection with the operation of the well and are therefore considered an integral part of the well for reclamation certification purposes.

Well sites: On public land (including parks and protected areas), well sites cannot be left without access, and access routes cannot be left dead-ending.

In some cases, the access road or portion of the access road runs through the well site and is required for another disposition. The portion that runs through the well site must be covered under a licence of occupation (LOC). This can be done by making an amendment or applying for a new LOC disposition.

Access roads: When a well site and a portion of the access road are certified, an amendment must be made under the *Public Lands Act* or *Parks Act* to delete the certified portion of the road on the disposition. The remaining portion of the access road must be held under the appropriate disposition type.

The amendment must clearly show the location of the overlapping activity on the survey, diagram, or map and reference the facilities associated with the activity. If an amendment to the disposition has not been submitted with the reclamation certificate application, the disposition will remain active until the amendment that includes the remainder of the well site under the access road is completed.

In some cases, an access road needs to be assigned to a holder of non-specified land (e.g., forestry company). This involves transferring the disposition from specified land to non-specified land. The specified landholder must obtain reclamation certification prior to the disposition transfer. Consent from EP is required to waive the reclamation criteria for this feature (i.e., the access road) to be left in place.

4.5.2 Overlapping Exemption on Private Land

In most cases, activities of one operator should not adversely affect another operator. If there have been no adverse impacts, both operators may apply for a reclamation certificate after their respective sites have been assessed for contamination, all contamination has been remediated (if required), and the sites meet the reclamation criteria.

Overlapping exemptions may be used in situations where there are two or more specified-land activities on an area of land. For example,

- two operators sharing a portion of an access road,
- a pit or a mine going through a well site,
- a re-entry well where the lease area is slightly different, or
- overlapping well site leases.

Where overlapping activities prevent successful reclamation of a site, the operator whose area has been affected can request an overlapping exemption, which excludes the area still in use by the overlapping activity. The last remaining operator agrees that once the facility is abandoned, it will assume responsibility for obtaining a reclamation certificate on the remaining overlapping area.

An overlapping exemption form³ is only required with an application for a reclamation certificate when a portion of a lease is to be excluded for a different operator's specified land activity. Do not submit the overlapping exemption form when the exempted area is being retained by the same operator. The applicant must clearly demonstrate the reason for retaining the area.

When applying for an overlapping exemption on a portion of the lease, the overlapping exemption form should be completed by both operators and accompany the reclamation certificate application for the remainder of the site. The form must include one copy of the survey plan that clearly highlights the area excluded from the reclamation certificate. When submitting the reclamation certificate application for the remainder of the site, ensure that the survey plan in the application outlines in yellow only the area to be certified. DO NOT include the area exempted.

Complete overlapping exemptions may be used when one company wishes to remove the AER liability assessment for a well licence that is located on the same surface holding of another company's well. The second company must have its own well licence on the same surface holding. The first company holding the abandoned wellbore has the option of either having its wellbore added to the reclamation certificate application (if it knows when or that it is being applied for) or the company can use the overlapping exemption form to have the requirements for a reclamation certificate waived for its well licence.

³ Application for Exemption from Requirement to Obtain a Reclamation Certificate Due to Presence of an Overlapping Activity.

For further information on overlapping exemptions, refer to the Government of Alberta *Guide to Certification for Site Reductions, Additions, Overlaps, Multi-Well Facilities, and Forced Lease Boundary Changes*.

5 Environmental Site Assessment

An ESA is an investigation to determine the environmental condition of a site.

Phase 1 and Phase 2 ESAs have been developed as separate submission requirements. The intent is for operators to submit these ESAs throughout the life cycle of the activity as they are conducted (e.g., Phase 1 ESA conducted at abandonment of the wellbore should be submitted on line at that time rather than at the time of reclamation).

Operators are required to submit Phase 1 ESAs and, if necessary, Phase 2 ESAs prior to the on-line submission of the reclamation certificate application. The Government of Alberta *Alberta Environmental Site Assessment Standard* should be used when preparing ESAs. Refer to sections 10 and 11 below for further details on Phase 1 and 2 ESA submission requirements.

5.1 Phase 1 ESA Summary

The primary objective of a Phase 1 ESA is to determine whether a site is or may be contaminated.

The Phase 1 ESA information in the application is prepopulated from the Phase 1 ESA submission unless a Phase 1 is not required. A Phase 1 ESA is not required for sites that were prepared but not drilled, log decks, access roads submitted as a standalone application, pipeline right-of-way if the pipeline was not constructed, and borrow pits. No Phase 1 is required for portions of the site where there is known contamination, remediation has been completed, and a Phase 3 ESA has been completed. For OSE programs and CEPs, there will be only a single Phase 1 ESA, which includes all core holes and, at a minimum, the drilling waste disposal location and associated dispositions, as well as a search for any incidents or spills associated with the program.

The system will prepopulate the date and results of the Phase 1 ESA into the application. If more than one Phase 1 ESA was completed, applicants should enter the reference number for the most current report.

5.2 Phase 2/3 ESA Summary

Where a site contamination status is not known, a complete Phase 1 is critical for a successful Phase 2 ESA. However, when contamination is known for a particular area of a site, a Phase 1 is not necessary prior to a Phase 2/3 ESA being completed for that area of the site. A Phase 2/3 ESA provides information on the initial intrusive site investigation through to confirmatory data analysis. The Phase 2/3 ESA information in the application is prepopulated from the Phase 2/3 ESA submission unless a Phase 2/3 is not required.

5.3 Drilling Waste Disposal Information

The drilling waste management information required in the application will be populated from the Phase 1 ESA previously submitted.

6 Stakeholder Information

6.1 Operator, Applicant, and Consultant

6.1.1 Name of Operator for Certificate

Confirm the full, legal registered name of the company that is to appear on the reclamation certificate. In most situations this will be the applicant. However, in some cases applicants may be applying on behalf of a defunct operator.

The applicant's name (operator) listed in the application must be the registered corporate legal name and the registered holder of the public land disposition, if applicable. Do not use any abbreviations in the applicant's name unless registered with the abbreviation. Ensure that the contact information for direct correspondence is provided.

6.1.2 Consultant

The legal registered name of the consulting company must be provided. The consultant listed in this section does not necessarily have to be the same individual as the environmental professional that signs the professional declaration.

6.2 Landowners & Occupants

6.2.1 Landowners

On private land, "landowner" refers to all parties listed on the registered land title. Operators must ensure that the current landowners' names, addresses, and phone numbers are provided. Land titles should be current and dated within the last 60 days of the date of submission of the application to the AER.

In some cases, a landowner may legally designate another party to act on its behalf. In the case where a life estate or absentee landowner is involved, documentation must demonstrate that the relevant party was contacted and the application package was sent to them. Should the operator be made aware of any changes to the land title after the application is submitted and prior to the reclamation certificate being issued, it must forward the new information to the AER.

On public lands within Special Area No. 2, 3, or 4, the landowner is considered the Special Areas Board and all other parties are considered the occupant.

On public land outside of the special areas, the landowner is the Crown, with the exception of sites located within a provincial park, wildland park, provincial recreational area, natural area, ecological

reserve, or heritage rangeland. In these cases, EP's Parks Division must be listed as the landowner and a copy of the application package must be forwarded to its office.

If the site is located in a Métis settlement, the applicant must complete a registry search and maintain a record of contact and discussion with the landowners and occupants, and provide a copy of the application to the settlement office and the landowners and occupants.

Operators must ensure that the landowner (or designate) is interviewed, that their concerns are addressed, and that they are sent a copy of the application package 30 calendar days before the application for certification is submitted.

6.2.2 Occupants

On private land, "occupant" typically refers to the person who is renting or working the land and is not registered on the land title. On public land, "occupant" typically refers to the grazing leaseholder or grazing reserve manager. Forest management agreement holders and trappers are not considered occupants of public lands. On public lands that are within Special Area No. 2, 3, or 4, the landowner is considered the Special Areas Board and all other parties are considered the occupant. Operators should ensure that the occupant is interviewed, that their concerns are addressed, and that they are sent a copy of the application package 30 calendar days before the application for certification is submitted. The current occupant's name, address, and phone number must be provided in the application. On public land, **do not** send Public Lands and Forests district offices copies of the application package unless they are listed as the managers of the grazing reserve.

For land located within a provincial park, wildland park, provincial recreational area, natural area, ecological reserve, or heritage rangeland, staff from the Parks Division must be contacted prior to developing the reclamation plan to confirm the desired end state. Parks Division staff must be given a growing season to inspect, prior to the AER receiving the reclamation application.

6.2.3 Presubmission Requirements / Landowner Contact

Operators must ensure that **all** landowners and occupants have been sent an identical copy of the application package a minimum of 30 calendar days before they intend to submit to the AER. Operators must also ensure that information regarding the procedure for submitting a statement of concern (SOC) is provided to the landowner and occupant (if applicable) with the application package.

Operators must provide all affected parties with a copy of the following documents:

- *EnerFAQs Expressing Your Concern – How to File a Statement of Concern About an Energy Resource Project,*
- the Statement of Concern About an Energy Resource Project form, and

- once an application has been submitted to the AER, a copy of the public notice of application from the AER website.

Operators do not include a complaint form in the application package that they provide to affected parties.

An application is considered incomplete if there is no indication that the landowner and occupant were contacted before the application was submitted or if they did not receive a copy of the application. The material can be either hand delivered or mailed to the landowner and occupant.

The AER strongly encourages operators to meet with any landowners and occupants in person to explain the contents of the package. This process improves communications between operators and landowners and allows landowners to better understand the work done on their land. If there are unresolved landowner or occupant concerns and the operator intends to continue with the reclamation certificate application submission to the AER, the landowner or occupant has the ability to file an SOC. If the operator is aware of any unresolved landowner concerns, it must indicate that in the application.

7 Reclamation Information

Reclamation information includes the dates of survey, construction, reclamation, and assessment; the land-use criteria used to assess the site; the revegetation approach, including fertilization, herbicide use, amendments, and soil additions; any written acceptances obtained as part of the reclamation; and the detailed site assessment information. The following is a summary of the information that is to be included.

7.1 Dates – Survey, Construction

Enter the most recent survey date. Review the surveys to ensure that any features, such as former access roads, have not been overlooked.

If the site has additional areas that were constructed during different time periods, include the construction date for each of the individual assets or associated facility. For example, a temporary workspace may be constructed for remediation purposes after the well is abandoned.

For sites with more than one wellbore, enter the abandonment date of the last well.

Where progressive reclamation occurs or more than one reclamation assessment is done, enter the date for the final reclamation or assessment.

7.2 Criteria Category Used

The intended land use of a site will determine the applicable reclamation criteria used to assess the site (e.g., cultivated lands, native grasslands, forested lands, or peatlands).

In some cases, a change of land use at a site from the original use may require the applicant to apply using different assessment criteria from the original pre-existing conditions to the current surrounding or adjacent end land use (e.g., from forested lands to cultivated lands).

This does not refer to a change in end land use with regard to the remediation guidelines (i.e., agricultural, residential/parkland, commercial/industrial, or natural area), but to a change from the predisturbance or off-site plant community as it relates to the reclamation criteria. Municipal zoning requirements and changes are the jurisdiction of the municipality. Zoning will affect the remediation guidelines used to assess the site.

Requests for changes to the assessment criteria must be approved in advance by the AER. A copy of the written acceptance must be submitted with the application. Documentation demonstrating discussions with the landowner, land manager, or occupant about the implications of this assessment criteria change must be included, along with signed acceptance of the criteria changes by the landowner, land manager, or occupant.

On public land, EP is the land manager following reclamation certification and thus must be in agreement with any criteria use change. Approval by EP is required. Additionally, where there is an occupant on public land, their consent must be received as well. A copy of the approval from EP and the occupant must be submitted with the application.

Operators may provide the following information to support an assessment criteria change:

- topography relative to adjacent developed land;
- predisturbance or off-site community type (e.g., eco-site phase, ecological range site, agronomic community, or Alberta wetland classification);
- current vegetation community type and site photos;
- adjacent land use: distance to cultivation, grassland, Green Area boundary (as relevant);
- access: distance, topography, presence or absence of impact to hydrology and off-site vegetation;
- soil: A horizon, subsoil, texture, stoniness;
- climate class;
- agricultural capability class for cultivated lands (as appropriate); or
- development plan for alternative development (e.g., recreational site).

7.3 Preconstruction Assessment

Preconstruction assessments are beneficial to planning construction and reclamation activities and are strongly recommended on private land and all native grasslands. A preconstruction assessment report must be dated and include the name of the company and the person who completed the report. For new developments within parks and protected areas, operators must consult with the Parks Division for requirements.

Submit any preconstruction assessments with the application to the AER as part of the predisturbance information specific to the site. Predisturbance information may be especially relevant if the historical environmental field report (EFR) or preconstruction assessment showed anomalies or variations within the lease area prior to construction. (e.g., pre-existing trails, pre-existing disturbance, topsoil depth or texture variability). The presence of weeds, regardless of their classification under the *Weed Control Act*, must be noted on the EFR or preconstruction assessment, as well as any anticipated weed control measures.

If more than one preconstruction assessment has been completed, enter the date of the most recent assessment.

On public land, do not submit a copy of the EFR with the application for reclamation certification.

7.4 Revegetation, Fertilizer, Herbicides, and Sterilants

7.4.1 Revegetation Approach

Indicate if natural recovery was used. Natural recovery involves long-term re-establishment of diverse native ecosystems (e.g., prairie, forest) by establishment in the short term of early successional species. This involves revegetation from soil seedbank or natural encroachment and no seeding of non-native agronomic species. Documents such as *Sites Reclaimed Using Natural Recovery Methods (R&R 03-6)* and the *Recovery Strategies for Industrial Development on Native Prairie* by subregion provide direction on natural recovery.

Provide the date on which the site was seeded, if applicable. For sites that have been seeded to pasture or other perennial vegetation, attach a copy of the species mix approval, seed certificates, and the date seeded if known. If this information is unavailable, provide a list of the species composition found on site. If the site is being farmed by the landowner or occupant and is in annual vegetation, indicate “annual crop.”

Refer to *Problem Introduced Forages on Prairie and Parkland Reclamation Sites: Guidance for Non-Cultivated Lands (R&R 03-5)*, for guidance on allowable cut-off dates for sites seeded on prairie or parkland areas. Each jurisdiction may have different cut-off dates for seeding of non-native species. Ensure that the landowner or land manager has been consulted prior to submitting an application to ensure

that the plant species present on site are acceptable. All seed mixes within parks and protected areas must be preapproved by Parks Division staff.

7.4.2 Fertilizer

If fertilizer was applied to the site, provide the date of application and type of fertilizer. If fertilizer is applied on lease and the controls are not similarly amended, the vegetation assessment must be completed a minimum of two years after the last fertilizer application. If an application is submitted prior to the two-year waiting period, the application will be refused. If fertilizer has been applied to the surrounding field and site as part of normal farming practices, then no waiting period is required.

On public land, native species must not be fertilized unless AER or EP staff provide approval. Any fertilizers within parks and protected areas must be preapproved by Parks Division staff.

7.4.3 Herbicide and Sterilant Use

Operators must provide the dates and information related to herbicide and sterilant use on site prior to site construction, during production, and postreclamation. Company files must be checked for sterilant and herbicide use during site construction and during operations. If herbicides have been applied across the field (including the assets being applied for) as part of normal farming practices, documentation of use is not required.

One full growing season after herbicide application, including an overwintering period, must occur before completing a detailed site assessment for the purpose of reclamation certification to verify the effectiveness of the application and control of the undesirable vegetation. If the herbicide application is applied simultaneously to the site and surrounding adjacent lands as part of normal farming practices at the same rates, the waiting period is not required. Any herbicides and sterilants within parks and protected areas must be preapproved by Parks Division staff.

7.4.4 Soil Amendments

Soil amendments such as manure, gypsum, straw, and peat can provide physical, biological, and nutrient improvements to soils. However, manure and other organic amendments are not topsoil replacements. These improvements are more beneficial in the short term rather than the long term. In some cases, the amendment may affect the site's soil chemical properties, such as electrical conductivity. The following information is required if amendments are made to the site:

- amendment type,
- date of application, and
- location on site where amendments are added as well as the physical and chemical properties of the amendments. Soil quality deficiencies and amendment properties must be reported in the application.

Complete the vegetation assessment a minimum of two years after the last amendment application. This coincides with the two-year waiting period for fertilizer inputs to all land uses when on site and off site are managed differently.

If manure and other amendments are applied simultaneously to the site and surrounding adjacent lands as part of normal farming practices at the same rates, a two-year waiting period is not required. Operators must obtain landowner agreement prior to applying an amendment on private land, and an agreement or approval from the land manager and, if applicable, the occupant on public land. Land managers for public land sites may have additional requirements or restrictions. For example, manure is not allowed on White Area public land sites. All amendments within parks and protected areas must be preapproved by Parks Division staff.

7.4.5 Topsoil Additions

Topsoil additions may be required on sites due to improper soil conservation, topsoil loss, or erosion, or to avoid restripping a site where desirable vegetation is already established. The topsoil must be described (e.g., source, texture, lab analyses, volume, weeds) and be comparable to the control topsoil quality (e.g., chemistry, structure, texture). Documentation containing the date of application and volume of topsoil additions and showing landowner and, if applicable, land manager approval are required on private lands, while approval from the applicable land manager is required for public lands. Topsoil additions within parks and protected areas must be preapproved by Parks Division staff.

Where topsoil is added to improve soil quantity and/or quality (and controls are not similarly amended), the physical (e.g., texture, colour) and chemical (e.g., pH, salinity, metals, and nutrient content) properties of the topsoil should be characterized prior to their use.

Although it is preferable to source the soil directly from the landowner or land manager, if the soil is to be imported, it must not be from areas with known weeds or diseases. If importing topsoil, it is recommended that testing be done for foreign weeds (i.e., weeds not normally found in that area) and problematic diseases for the area (e.g., clubroot). The following information is required if topsoil additions are made to the site:

- addition type,
- location of topsoil addition,
- date of addition, and
- if on private land, written consent from the landowner to import topsoil, or
- if on public land, written consent from the applicable land manager to import topsoil.

7.4.6 Non-Oilfield Waste

Companies are encouraged to use existing facilities, such as municipal landfills, for disposal of non-oilfield waste; this includes such things as garbage and domestic waste, cellulose material (e.g., trees, vegetation) and inert debris such as concrete. Volume minimization, including reuse, recycling, and recover strategies should be used whenever possible.

Landowners and occupants must be contacted and a signed agreement (written approval) provided for burial of any material on lease. Waste burial will not typically be approved within parks and protected areas.

Any known burial of non-oilfield material should be noted. *Burial of Material On-Lease (C&R/IL/ 97-5)* includes reference to other EP and AER documents that must be complied with prior to a reclamation certificate being issued.

Burial of brush and trees—Buried brush and trees may lead to decomposition, subsidence, and generation of methane gas, toluene, phenolic compounds (aspen wood leachate), etc. EP issued requirements that all trees be salvaged or removed and disposed of by burning or other approved disposal methods with the exception of remnants of burn piles. If there is a disagreement between parties as to whether or not trees or brush were buried on site, the operator will be asked to provide a written declaration that brush and trees were not buried on site. Burial of brush and trees within parks and protected areas must be discussed with Parks Division staff.

Storage of topsoil in pits—Storage of topsoil in pits is not permitted, as it can affect the quality of topsoil and makes it difficult to track storage locations if the property is sold.

7.4.7 Facilities/Features to Remain in Place

If facilities or features are remaining in place as an improvement, the application must be accompanied by a written acceptance signed by the appropriate parties acknowledging that they agree to the facilities or features remaining in place on site. If a landowner or land manager does not want the facilities or features left in place, the site must be completely reclaimed.

A survey plan must be attached to the written acceptance indicating in red which portion of the site is being accepted by the landowner. If the land title has been transferred or sold to a new landowner prior to certification, the pre-existing acceptance from the previous landowner is no longer valid and will result in the application being refused or the certificate being cancelled. If the improvements are not legitimate or not required, or if they pose a potential liability or environmental risk, the agreement will not be accepted by the AER and the application will be refused or the certificate cancelled.

Facilities or features left in place as an improvement must be stable, nonhazardous, and nonerosive. Refer to the reclamation criteria documents for further information.

Written landowner acceptances may only be used for facilities and features remaining in place as improvements for landowner use (e.g., road grade not being reclaimed to allow continued access). Situations in which written acceptance cannot be used include the following:

- contaminated soil and groundwater is not remediated, or
- unreclaimed areas that are not improvements for landowner use.

Applications submitted with these types of acceptances will be refused.

EP must approve any improvements left in place on public lands. Following AER reclamation certification, the land is returned to the Crown and is managed by EP. Well pads, access roads, and other permanent or semipermanent features left in place must have written acceptance from EP. Occupants on public land must be consulted and a signed acceptance is required. A copy of the written acceptance must be submitted with the application. Requests should include disposition number, legal survey, and site photos.

For land managed by the Special Areas Board, written acceptance from the Board is required. Fences left in place need written acceptance from the occupant only.

For land located in a provincial park, wildland park, provincial recreational area, natural area, ecological reserve, or heritage rangeland, staff from EP Parks Division must agree to the feature or facility remaining and sign the acceptance.

Written acceptance for approaches from a municipal road must be obtained from both the landowner or land manager and municipality. Approaches located on numbered highways (Crown) will require written acceptance from Alberta Transportation, as well as the landowner or land manager.

7.4.8 Examples When Written Acceptance Is Required

Existing trails: If a trail existed prior to the operator entering the land and if the operator's activities have not caused further impacts, the trail does not need to be reclaimed. The operator must provide evidence that the trail existed prior to development (e.g., landowner statement, original survey plan, aerial photo or satellite imagery prior to drilling). On public land, if an existing trail was used, this must be documented in the Enhanced Approval Process, Schedule D, or the historical EFR. Any rutting, erosion, or compaction caused by the operation must be reclaimed to meet criteria, using a presite assessment or representative control on a portion of the trail not associated with well site operations. If the land next to the original trail has been disturbed (e.g., trail has been widened at corners), the disturbed area must be reclaimed and assessed or the landowner must provide written acceptance of the wider trail. If the trail has been upgraded to a road that is being left in place, the landowner must provide written acceptance for the road, which must be included with the application.

Power lines: Power lines are considered an associated facility and must be removed prior to certification. Where the line is required for other uses (e.g., another well site, another industrial activity, landowner use) another party must obtain a surface lease or disposition for the line prior to certification. If the other activity involves specified land, an overlapping exemption form must be used. Operators should discuss responsibility for removal and reclamation of the lines with the electric utility company prior to applying for a reclamation certificate.

Fences: Fences in grazing areas are often left in place to allow ungrazed vegetation to establish. Though not a requirement, it is beneficial to ensure on-site vegetation can withstand the same grazing pressure as off-site controls. Once the fence is removed, if the vegetation growth is not sustained, the reclamation certificate will be cancelled. For this reason, prior to certification and final site assessment, fences should be removed or opened to allow grazing pressure as would be found off lease. Sites on private land where fences will be left in place until after certification must be accompanied by written acceptance signed by the landowner or land manager for the removal of the fence following certification of the site. Otherwise, the application will be considered incomplete and refused. On public land, fences must be removed prior to reclamation certification.

Note: In Special Area No. 2, 3, or 4, occupants can provide written acceptance for fences. However, the Special Areas Board must provide written acceptance for roads.

Public lands: There may be instances where a well site is ready for certification, but a portion of the access road is still in use or required by another company. If only a portion of the access road is required to remain in use, an amendment must be made under the *Public Lands Act* to separate the reclaimed portion of the road from the portion still in use, creating two separate LOCs. The reclaimed portion of the road, under the original LOC, can then be certified with the well, and the portion in use will not lead to a dead end. In parks and protected areas, roads may be considered an improvement if they provide access to current or future public areas (e.g., recreational sites).

8 Detailed Site Assessment

8.1 Assessment Tool Information and Record of Observation

Landscape, vegetation, and soil assessment results must be entered as part of the on-line application. The Record of Observation data sheets are to be uploaded. For more information on the data requirements, see the reclamation criteria for well sites and associated facilities.

The following questions have been incorporated into the on-line submission form and are therefore no longer required in the Record of Observation.

- 1) Did the site fail any of the landscape assessment questions in the Record of Observation?
- 2) Did the site fail any of the vegetation assessment questions in the Record of Observation?

3) Did the site fail any of the level 1 soil assessment questions in the Record of Observation?

4) Did the site fail any of the level 2 soil assessment questions in the Record of Observation?

8.2 Professional Justification

An operator may provide justification as to why a site should be permitted to vary from the criteria and still receive certification. Operators should first discuss options with the AER prior to conducting the detailed site assessment. If a variance is being requested, the operator must provide the rationale for its decision, supported by acceptable references (e.g., soil surveys applicable to Alberta). Operators may request a preapproval for criteria variances allowing the application to proceed with the baseline review. Variances preapproved by the AER must be included with the application. If preapproval has not been obtained, the application will be subject to additional review.

Representative controls: Operators should make every attempt to use adjacent lands as a representative control when applying the reclamation criteria. However, there may be situations where the use of representative controls is not an option, such as

- restricted access (e.g., the assessors have not been granted access off site), or
- representative controls are not available (e.g., tame pasture on the lease surrounded by forest or cultivated lands).

In these situations, the operator must provide professional rationale for the controls used or use reference communities (e.g., grasslands) to assess the site.

8.3 Professional Assurance Table

Provide in the appropriate area the required information for each of the assessments conducted (landscape, soils, vegetation) on the site.

9 Application Declaration

The on-line system requires an electronic application declaration. Operators are ultimately responsible for their sites and, as such, are expected to review applications made on their behalf and declare that the application is accurate and complete. Providing false or misleading information to the AER may result in an enforcement response.

The representative of the operator who is authorized to declare the application must be a person with knowledge of the reclamation process (i.e., a member in good standing of one of the seven professional regulatory organizations listed in *Professional Declaration Requirements* [R&R/12-05]).

10 Phase 1 ESA

Minimum requirements for ESAs are provided in the *Alberta Environmental Site Assessment Standard*. General guidance on conducting a Phase 1 ESA is available from the Canadian Standards Association (*CAN/CSA Z768-10: Phase I Environmental Site Assessment*).

A Phase 1 ESA is mandatory for all sites, except for

- sites that were prepared but not drilled;
- log decks, campsites, borrow pits, access roads, or other associated facilities submitted as a standalone application;
- pipeline right-of-way if the pipeline was not constructed; and
- areas of the site known to be contaminated and remediated and confirmatory sampling provided.

The goal of the Phase 1 ESA is to have a sufficient amount of information to estimate the likelihood that contamination may be present and whether a Phase 2 ESA is required. If there is insufficient information to complete the Phase 1 ESA and determine if contamination is present, a Phase 2 ESA is required.

For OSE programs and CEPs, there will be only a single Phase 1 ESA, which includes all core holes and, at a minimum, the drilling waste disposal location and associated dispositions, as well as a search for any incidents or spills associated with the program.

A complete and adequate Phase 1 ESA should either

- provide assurance that the reclamation certificate application is complete without a Phase 2 ESA because contamination is unlikely, or
- provide information that can direct a Phase 2 ESA or remedial activities at the site.

To ensure that the site information is adequate to complete a Phase 1 ESA, it is important to gather the requisite information at appropriate times in the life cycle of the site. During the life of a lease site, several milestone events occur that may inhibit assessment of indicators, such as surface staining from hydrocarbon spills or crusting from salts. When activities such as soil replacement and infrastructure removal (buildings, risers, wellheads, storage tanks, etc.) are occurring, documenting the condition of the surface prior to completion of the activity is highly recommended, including gathering photographic evidence or conducting confirmatory sampling. This ensures that information on the presence or absence of contamination on the site is available.

For sites that were constructed using minimum disturbance practices on grasslands and native prairie, and no drilling waste was disposed on site, a Phase 1 ESA should be conducted following abandonment prior to final reclamation. If the Phase 1 ESA is not undertaken until after final reclamation, the Phase 1 ESA

site visit can be completed at the same time as the detailed site assessment. Within parks and protected areas, the Parks land-use officer should be present for the site visit.

An operations-phase site sketch is required with all applications, and a construction-phase site sketch is required for all sites built since 1994. If accurate sketches cannot be created from company records, Phase 1 ESA site visits, or aerial photos, efforts should be made to indicate the possible location of on-site facilities for the purposes of the Phase 2 ESA. Sketches must illustrate the features, facilities, and infrastructure and any spill locations on the site.

The professional declaration information can be found on the ESA submission on-line page. The AER will refuse any reclamation certificate applications that do not strictly adhere to the requirements for a professional declaration, as outlined in *Professional Declaration Requirements (R&R/12-05)*.

10.1 Drilling Information

Consult company well files for drilling information. Tour reports are another source of information on drilling activities and can be obtained from the AER Core Research Centre. (See appendix 1 for contact information.)

10.2 Re-entry of a Well or Site Re-drilled

If an application is for a previously certified site, provide the reclamation certificate number and the date certified.

For the purposes of section 10.2, re-entry of a well occurs when an existing wellbore is re-entered using drilling fluids containing additives. A re-drilled site is one where another well was drilled on the same lease, and as a result, more than one drilling waste disposal event has occurred. Drilling of wells on a multiwell pad, where the drilling wastes are combined and disposed of at the same time, is not considered re-drilling for the purposes of section 10.2.

Whether or not a reclamation certificate has been issued, the current well licensee on a re-entered well is responsible for remediating and reclaiming the lease site, including impacts from previous activities such as drilling waste disposal areas, flare pits, or spills. This liability extends to off-lease impacts associated with the operation of the re-entered well. Where a second well is drilled on the same site by a different operator, the operator applying for a reclamation certificate must show that the entire site included in the application, including any areas affected by the previous well, has been assessed and remediated, if necessary. Consequently, it is strongly recommended that an operator conduct an ESA prior to re-entering a well or re-drilling a site to determine if contamination is present from previous operations. All ESAs should be listed in the Phase 1 ESA.

10.3 Drilling Waste Disposal Information

Drilling waste disposal methods and locations for all drilling wastes associated with the drilling of the site must be provided. The AER recognizes that on older sites, where legislation was not in place for recording drilling waste disposal, the location of drilling waste disposal may be unknown. Operators are expected to exhaust all reasonable avenues to locate the disposal area. Where more than one disposal method or location was used, ensure that detailed information is provided for each. All on-lease waste disposal locations should be shown on the appropriate construction- or operation-phase site sketches.

On-lease sump: Provide the location of the sump area on the lease using GPS coordinates, if available, and the sump dimensions, including sump depth and cover depth. This information must be provided in cases where off-lease methods were used, but other drilling waste materials (e.g. shale, cuttings, cement returns) in excess of 50 cubic metres (m³) were disposed of on the lease. All on-lease disposal locations must be shown on lease diagrams. If this information cannot be obtained and the compliance option checklist cannot be completed or indicates a Phase 2 ESA is required, the Phase 2 ESA must be included in the application.

Remote sump: Provide all the information as for an on-lease sump. If the sump has been previously certified with another well site, provide the certificate number and date of certification. On public land, provide only the disposition number (MSL) that the sump was certified under. If the remote sump is not being applied for at this time, provide the legal land location, the well licence number, and disposition number for the well site with which the sump will be certified. On public land, authorization from the public lands or forest officer is required to attach a remote sump to an unrelated well.

No drilling waste disposed on site: There may be cases where the drilling waste was not disposed on site. For example, a sump was constructed but not used because the waste was completely disposed of by landspray, landspray while drilling, or pump-off, or at an approved waste management facility. If this was the case, provide detailed information on the disposal method or evidence that the waste was tanked and disposed of at a waste management facility. For example, list the waste manifest numbers in the Reference Document section of the compliance option checklist.

Drilling mud (type, volume): Ensure that the volumes and types of all waste are provided and that the information is consistent with the AER's Directive 50: Notification of Drilling Waste Disposal form or other documents. Ensure that any conflicting information is explained.

Drilling waste disposal methods and locations: Disposal methods and locations for all drilling waste associated with drilling of the site must be provided. If more than one disposal method or location was used, provide detailed information for each (e.g., fluids landsprayed while drilling; solids, shale cuttings, and cement returns disposed of on lease in the sump via mix-bury-cover). All on-lease waste disposal locations should be shown on the appropriate construction or operation-phase site sketches. If the compliance option checklist cannot be completed or indicates that a Phase 2 ESA is required and the

waste disposal location is unknown, all reasonable efforts must be made to assess potential disposal locations on the lease.

Drilling waste disposal assessment options

Provide with the application all the information required under the AER *Assessing Drilling Waste Disposal Areas: Compliance Options for Reclamation Certification*.

When completing this section, you will also need to complete and submit the following drilling waste forms:

- Assessing Drilling Waste Disposal Areas – Checklist for Compliance Options 1 and 2
- Assessing Drilling Waste Disposal Areas – Calculation Tables for Compliance Options 1 and 2

The following information is provided in an effort to prevent common errors that have been observed while reviewing previous application checklists:

- Salinity guidelines: The Directive 50–equivalent salinity guidelines in *Assessing Drilling Waste Disposal Areas: Compliance Options for Reclamation Certification* are restricted to drilling waste disposal areas. The rest of the site must meet the *Alberta Tier 1 Soil and Groundwater Remediation Guidelines* and *Alberta Tier 2 Soil and Groundwater Remediation Guidelines*. Other contaminants in the drilling waste disposal areas, such as hydrocarbons and metals, must meet the Alberta Tier 1 and 2 guidelines.
- Landspray while drilling: For sites using Compliance Option 1, if drilling waste has been disposed of by landspray while drilling and greater than 50 m³ of cuttings have been disposed of on site, the Compliance Option 1 checklist must be completed. If drilling waste material has been disposed of off lease and less than 50 m³ cuttings have been disposed of on site, only sections 1.0 to 1.3 of the compliance option checklist should be completed.

10.4 Production, Storage, and Environmental Information

10.4.1 Current and Historical Infrastructure

List all known infrastructure associated with the facility since the initial disturbance.

The *Alberta Environmental Site Assessment Standard* provides guidance on potential sources of contamination and possible contaminants that may be associated with specific infrastructure. However, some sources and types of contamination may not be listed.

Indicate associated activities on a site sketch. Note that any facilities and infrastructure remaining (e.g., access roads) will require written acceptance (see section 7.4.8).

10.4.2 Flare Pits

Indicate if a drilling or production flare pit was used on the site. This information should also be shown on the construction- or operation-phase site sketch for known locations. If a flare pit was built but not used, confirmatory sampling from the flare pit area is not required. If a flare pit was used, confirmatory sampling is required. If flare tanks were used, confirmatory sampling is not required unless there have been spills from the tank.

10.4.3 Storage Tanks

Indicate if above- or belowground storage tanks were used on the site and their contents, if known. The location of the tanks, if known, must be documented on the applicable construction- or operation-phase site sketch.

If an environmental consultant was present during the removal of an underground storage tank that contained only hydrocarbons and there was no evidence of staining, submit this information with the reclamation certificate application. If staining or other indicators of a release were observed, a Phase 2 ESA is required in the tank area unless sufficient soil samples were collected for analysis during tank removal.

If the underground storage tank contained produced water, a Phase 2 ESA is required unless a consultant was present and collected sufficient samples for analysis during the tank removal.

If a consultant was not present when the underground storage tank was removed, a Phase 2 ESA is required to determine if spills or releases occurred.

10.4.4 Fluid Disposal

The fluid disposal method used must be stated, if applicable. If fluid was piped or trucked to or from the site, spills or releases may have occurred. Pipeline releases associated with the well site lease must be remediated and confirmatory sampling analysis data included in the application. (Refer to section 10.3.6 for additional information.)

10.4.5 Other Facilities or Infrastructure

Any other facilities or infrastructure remaining on site, such as a waste or chemical storage facility, a handling facility, buried pits, or landfills, must be included in the application. Indicate the location of these facilities on the construction- or operation-phase site sketch.

10.4.6 Spills and Releases

Provide a complete history of spills and releases associated with the site. On-site and off-site spills and releases associated with the area being applied for must be remediated and reclaimed. This includes spills and releases from associated facilities such as remote sumps or pipelines. Releases that have migrated off site from the lease or an associated facility must be remediated. Documentation must be provided to show

spills and releases have been remediated to meet the applicable Alberta remediation guidelines. Company files and the AER spills and releases database must be searched.

For each spill or release, the following must be documented and submitted unless otherwise indicated:

- **Date (d/m/y):** Provide the date of the spill or release. If there is evidence of historical or cumulative contamination in an area, provide the date it was identified.
- **Reference or incident numbers:** Where applicable, the EP reference number (typically six digits) and AER incident number (e.g., 20041956) should be provided, along with copies of all related correspondence and documentation. EP and AER incident numbers are provided to the party reporting the spill or release at the time a spill is reported. Although it is preferable to have these numbers, applications will not be refused if they are unavailable. It is not necessary to contact EP or the AER for these numbers.
- **Type:** Provide information on the type of spill or release that occurred, e.g., release from aboveground storage tank or pipeline release, pipeline depth 1.2 metres, etc.
- **Product and volume (spilled and recovered):** Provide the product type and volume of material spilled and recovered, e.g., 100 m³ release of crude oil, 98 m³ free product recovered.
- **Diagram:** Where spills and releases have been identified, provide a schematic diagram showing all spill or release locations. The diagram should include
 - exact locations of any spill or release with legal land description and GPS coordinates, if possible, showing the size and extent of the spill;
 - locations where soil and water sampling was completed;
 - survey for lease showing lease boundaries, facilities, pipelines, etc.; and
 - location and distance of surface and groundwater receptors from spill or release.

Where information is not available, the AER expects the operator to conduct a reasonable level of assessment to ensure that spills or releases meet the AER's remediation requirements.

10.4.7 Previous ESAs

Any previous site assessments of a property should be documented in this section. If there have been any previous ESAs conducted on the site, provide the name of the consulting company and consultant's name, report title, report date, and a summary of the report findings.

In some cases, company files may not be available. However, due diligence must be exercised in searching for the appropriate files and checking all available information sources.

10.5 Phase 1 ESA Site Visit

The Phase 1 ESA involves collecting information about past activities or events that may have resulted in contamination on a site. The Phase 1 ESA includes a site visit to identify visible evidence of contamination sources or actual contamination and to establish the need for a Phase 2 ESA. This site visit must be conducted prior to soil replacement during reclamation. No intrusive sampling of soil or water is conducted during the Phase 1 ESA. The following are examples of information that could be collected during a site visit:

- **Date (d/m/y):** Provide the date of the Phase 1 ESA site visit.
- **Assessor:** Indicate the name of the person who conducted the site visit and their employer's name.
- **Surrounding land use:** Describe the land use surrounding the site in all four directions.
- **Topography:** Describe the topography across the site. Include any topographical changes in relation to the off-lease areas that may have occurred as a result of the well site.
- **Vegetation:** List the type of vegetation and plant species on the site and the surrounding area.
- **Proximity to neighbouring features:** List features such as residences, water wells, and surface water bodies (ponds, streams, rivers) and provide the distances from the lease. The Groundwater Information Centre website has a list of water wells registered in Alberta (see appendix 1 for contact information).
- **Visual indicators:** Document the type of facility present, its size, and location on the operations-phase site sketch. On-site equipment or tanks, along with visual signs of former facilities, or open or buried earthen pits may indicate potential contamination sources.
- **Evidence of past spills:** Provide information on any visual indicators of contamination identified during the Phase 1 ESA site visit. Indicators may include staining, presence of crusted soils (indicating salt spills), changes in soil characteristics, or slumping, depression areas. Areas where contamination is suspected require a Phase 2 ESA.
- **Adjacent land affected by operations on the site:** Any operational off-lease impacts originating from the site must be noted in this section. This may include off-lease vegetation impacts, rutting, and water ponding. Detailed information should be recorded during the site visit identifying the type of impact, the potential cause, area affected, etc. If any off-site impacts are identified, details of the remedial measures must be provided. All available, relevant information, including incident reporting, must be included with the application.
- **Vegetation stress:** Provide the location of any stressed vegetation and size of the affected area. Visual indicators of vegetation stress include bare soil or indicator plant species such as kochia or foxtail barley, which are typically associated with saline soils. A Phase 2 ESA must be conducted in these areas if contamination is suspected.

- **Prohibited noxious, noxious, or problem/volunteer weeds:** If weeds are present on the site, document the species, location, and number. Assessors must be familiar with the species of concern in the municipality they are working in. Some local authorities have raised individual species from one category to another. Assessors are encouraged to talk to the local weed inspector. All prohibited noxious weeds must be eliminated and noxious weeds must be controlled to at or below the density in the control fields. Problem or volunteer weeds must be controlled on site and do not require a different level of management than the control fields.

Public land managers may also have specific restrictions on species (e.g., downy brome and crested wheat grass on native prairie). Operators are encouraged to contact the public land manager regarding weed management and requirements under the *Weed Control Act*, *Public Lands Act*, and *Special Areas Act*. Parks Division staff must be contacted to discuss weed management for sites within parks and protected areas. Refer to *Weed Management on Industrial Sites (R&R/12-01)* for additional information.

- **Conflicting information:** The site visit should confirm or validate the findings from the file or imagery review. Indicate and clearly explain any conflicting information.
- **Photos:** Photos taken during the Phase 1 ESA site visit must be included in the application. The following must be included at the bottom of each photograph:
 - date of photograph,
 - where it was taken from,
 - orientation of image (e.g., northwest, southeast), and
 - description of image.

10.6 Aerial and Satellite Imagery Review

Aerial or satellite imagery can provide a visual chronological history of activities that occurred at a site when viewed at an appropriate scale. Imagery can provide valuable information about a site, especially when the company documentation is not available or incomplete. Information about the site, such as location of facilities and features, sumps and flare pits, spills and cleanups, can be obtained. If the results of the Phase 1 ESA indicate contamination is likely, imagery can be used to develop a soil sampling plan.

Aerial or satellite photos that provide sufficient detail must be submitted with the reclamation certificate application. Provide on the application form the date the photograph was reviewed, the name of the reviewer, year the photograph was taken, scale, and observations.

10.6.1 Where to Obtain Imagery

There are several sources of imagery that should be reviewed for information. EP Air Photo Distribution has aerial photos of the province from 1949 on. Areas throughout the province have been photographed at various frequencies since that time and are held in the collection. The photos are catalogued and can be viewed at the Air Photo Distribution reference library. For more information on products and costs or to order aerial photos, contact Air Photo Distribution (see appendix 1 for contact information).

In cases where aerial photos are not available, other types of photos such as satellite photos or overview photos taken from an elevated height may be acceptable.

10.6.2 Size Required

Photos must be obtained at a scale of 1:5000 or 1:7500 to show details of the site. Aerial photos obtained from Air Photo Distribution are generally taken at a scale of 1:30 000. However, Air Photo Distribution can make enlargements from contact prints to provide site detail.

10.6.3 Imagery Required

- **Producing wells and batteries:** Photos showing the chronological history of the site from predisturbance to postabandonment are required. Specifically, one photo of the site prior to disturbance, photos at regular time intervals (2–5 years) during operations, and one photo postabandonment are required in order to show site changes. Photos taken during the producing phase of a well site allows features that may be associated with contamination to be identified, even if they were not included in the file review, e.g., aboveground storage tanks.
- **Drilled and abandoned wells:** One image of the site while it was being drilled is required, if available. If images of the active site are not available, predisturbance and postabandonment images are required.
- **Batteries, satellites, and other associated facilities:** Images of the site prior to disturbance, during operations, and postabandonment are required.

10.6.4 Imagery Information

Original or high-quality scanned images must be provided. Applications with poor-quality images will be refused. The images must have the following information documented directly on the image or on a clear overlay:

- lease location,
- identification of all visible features, and
- areas of potential contamination, e.g., possible sump, flare pit.

10.7 Interviews – Phase 1 ESA

People who may have knowledge about the operating site must be contacted during the interview stage as part of the applicant's due diligence. This includes the operator, landowner, and occupant. Absentee landowners or their designate should also be contacted. Information regarding site history, location of facilities/structures, site spills, etc. can often be obtained only through interviews. In some cases, a landowner or occupant is the only knowledgeable source of events that occurred on the site. An application is considered incomplete if there is no indication that the landowner was contacted during the Phase 1 ESA.

Several attempts should be made to contact the landowner, their designate, or an occupant, and each attempt should be documented. A single unanswered phone call is not sufficient. If the landowner or occupant cannot be contacted after several attempts, proof of reasonable attempts by the operator, including the dates, times, and methods used (e.g., phone, e-mail, letter, in person), must be provided.

Note: On public land, the AER is considered the landowner. Within special areas, the Special Areas Board is the landowner. Within provincial parks, wildland parks, provincial recreational areas, natural areas, ecological reserves, or heritage rangeland, the Parks Division is the landowner.

If a landowner or occupant has a concern or complaint regarding the site, it must be investigated and addressed prior to submission of the application. The concern or complaint and the operator's response must be documented in the application. Failure to do so will result in the application being refused.

Once an application has been submitted to the AER, the operator must provide a copy of the notice of application to all landowners and occupants.

10.8 Conclusion and Recommendations

Indicate the outcome of the Phase 1 ESA information:

- The Phase 1 ESA showed contamination was not likely present, so no Phase 2 ESA or remediation was completed.
- The Phase 1 ESA showed contamination was likely present, so a Phase 2 ESA was completed.
- The Phase 1 ESA had insufficient information to determine if contamination was likely present, so a Phase 2 ESA was completed.

11 Phase 2 ESA

This section provides guidance on Phase 2 ESA requirements for well sites and associated facilities. EP defines a Phase 2 ESA report as a document that provides information on the initial intrusive site investigation through to confirmatory data analysis. Remediation closure reports may be included as confirmatory data analysis as a separate document from the Phase 2 ESA report.

Minimum requirements for ESAs are provided in the *Alberta Environmental Site Assessment Standard*. General guidance on conducting a Phase 2 ESA is available from the Canadian Standards Association (*CAN/CSA Z769-00: Phase II Environmental Site Assessment*).

Doing a Phase 2 ESA requires knowledge of oil and gas operations, an understanding of what contaminants may be present and their fate and transport, and experience in undertaking soil and groundwater contamination assessments. Site assessments must be carried out under the supervision of a qualified professional.

A completed Phase 2 ESA meets three objectives:

- determines if contamination is present,
- identifies the degree and horizontal and vertical extent of contamination prior to remediation, and
- provides postremediation confirmation of soil and groundwater quality.

11.1 When to Provide a Phase 2 ESA

A Phase 2 ESA report must be provided if any of the following applies:

- There was insufficient information to determine the likelihood of contamination from the results of the Phase 1 ESA.
- The Phase 1 ESA indicated that there was a likelihood of contamination at the site.
- There is known contamination at the site.

If a Phase 2 ESA is not completed when required, the application will be refused.

11.2 Phase 2 ESA Information

A Phase 2 ESA and remediation closure report must be compliant with Alberta's remediation requirements as described in the Alberta Tier 1 guidelines or Alberta Tier 2 guidelines and must include the following if applicable

- site information, including drainage (surficial and internal), slope, and slope position;
- site facilities or spill areas that may be contaminated, including all areas identified in the Phase 1 ESA and any spill areas associated with the area covered by the application, both on and off lease;

- details of the investigation of the site, including exact locations from which samples were collected;
- sampling increments;
- borehole logs;
- the lateral and vertical extent of the contamination;
- a site map or aerial photograph of the site indicating borehole locations and possible sumps, pits, wellbore locations, and other facilities;
- depth to water table;
- a table of lab analytical data highlighting concentrations that exceed the applicable guidelines (e.g., Alberta Tier 1 or Tier 2) with references to the borehole locations on the map, as well as the lab data sheets;
- a detailed description of remediation activities at the site (may be in the Phase 3 report);
- an estimate of the volume of soil remediated or excavated (may be in the Phase 3 report);
- a diagram or description of the confirmatory sampling locations (may be in the Phase 3 report); and
- a table of confirmatory analytical data indicating that the applicable guidelines have been met, as well as the lab data sheets and supporting documentation for each remediated site.

11.2.1 Record of Site Condition Form

The record of site condition reflects the current state of the site. A Record of Site Condition form must accompany every final Phase 2 ESA, remediation report, and risk management plan submitted to the AER. If multiple Phase 2s have been completed for the same cleanup, a Record of Site Condition form must be submitted with the most recent ESA. The form and supporting documents are available on the EP website.

Appendix 1 Contact Information

Alberta Energy Regulator

Core Research Centre

3545 Research Way NW

Calgary, AB T2L 1Y7

Phone: 403-297-6400

E-mail: CRC.ServiceDesk@aer.ca

Alberta Energy Regulator

Information Distribution Services

Suite 1000, 250 – 5th Street SW

Calgary, AB T2P 0R4

Phone: 403-297-8311

Toll free: 1-855-297-8311

E-mail: InformationRequest@aer.ca

Product Catalogue: <http://www1.aer.ca/ProductCatalogue/index.html>

Alberta Environment and Parks

Groundwater Information Centre

Phone: 780-427-2770

Fax: 780-427-1214

E-mail: gwinfo@gov.ab.ca

Alberta Environment and Parks

Air Photo Distribution

Main Floor, 9920 – 108 Street

Edmonton AB T5K 2M4

Phone: 780-427-3520

E-mail: Air.Photo@gov.ab.ca

Alberta Environment and Parks

Parks Division

2nd Floor, Oxbridge Place

9820 – 106 Street

Edmonton, AB T5K 2J6

Phone: 780-427-3582

Fax: 780-427-5980

Appendix 2 Reference Documents

Below is a list of reference documents pertaining to reclamation and remediation in Alberta.

Alberta Energy Regulator

- Assessing Drilling Waste Disposal Areas: Compliance Options for Reclamation Certification
- Guide to Certification for Wellsite Reductions, Additions, Overlaps, Multi-Well Facilities, and Forced Leased Boundary Changes
- Pre-Construction Assessment Report for Wellsites (C&R/IL/00-08)
- Professional Declaration Requirements (R&R/12-05)
- Reclamation Certificate Application Tool: User Guide
- Remediation Certificates for Upstream Oil and Gas Sites (R&R/11-01)

Forms

- Application for Exemption from Requirement to Obtain a Reclamation Certificate Due to Presence of an Overlapping Activity
- Assessing Drilling Waste Disposal Areas – Calculation Tables for Compliance Options 1 and 2
- Assessing Drilling Waste Disposal Areas – Checklist for Compliance Options 1 and 2
- Professional Declaration for Reclamation Certificate Applications

Government of Alberta

- 2010 Reclamation Criteria for Wellsites and Associated Facilities
- Alberta Environmental Site Assessment Standard
- Alberta Tier 1 Soil and Groundwater Remediation Guidelines
- Alberta Tier 2 Soil and Groundwater Remediation Guidelines
- Burial of Material On-Lease (C&R/IL/97-5)
- Certification Requirements for Wellsites with No Surface Disturbance (Surveyed Only) (C&R/IL/94-3)
- Competencies for Reclamation and Remediation Recommendations Report
- Conservation and Reclamation Guidelines (C&R/IL/97-1)
- Frequently Asked Questions on the Remediation and Reclamation of Soil and Groundwater
- Glossary of Reclamation and Remediation Terms Used in Alberta
- Problem Introduced Forages on Prairie Reclamation Sites (R&R/03-05)
- Record of Site Condition Fact Sheet (R&R/09-02)

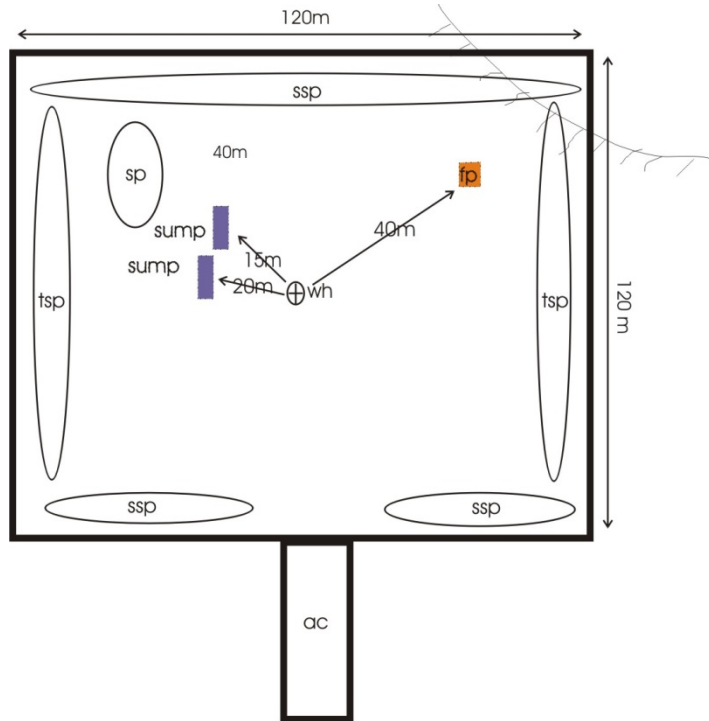
- Record of Site Condition Frequently Asked Questions
- Record of site Condition User Guide
- Remediation Certificates for Upstream Oil and Gas Sites (R&R/11-01)
- Salt Contamination Assessment and Remediation Guidelines
- Sample Abandonment Letter for Wellsites (C&R/IL/00-01)
- Sites Reclaimed Using Natural Recovery Methods: Guidance on Site Assessment (R&R/03-06)
- Subsoil Petroleum Hydrocarbon Guidelines for Remote Forested Sites in the Green Zone
- Third Party Impact on Reclamation (C&R/IL/97-4)
- Weed Management on Industrial Sites (R&R/12-01)
- Wellsite Construction: Guidelines for No-Strip and Reduced Disturbance (R&R/03-07)

Forms

- 2010 Assessment Tool and Record of Observations Data Sheets
- Acknowledgement of Information Disclosure for Upstream Oil and Gas Facilities
- Phase 2 Environmental Site Assessment Checklist
- Record of Site Condition
- Request for Information Required to Reclaim Public Lands Form

Appendix 3 Example Site Diagram Sketches

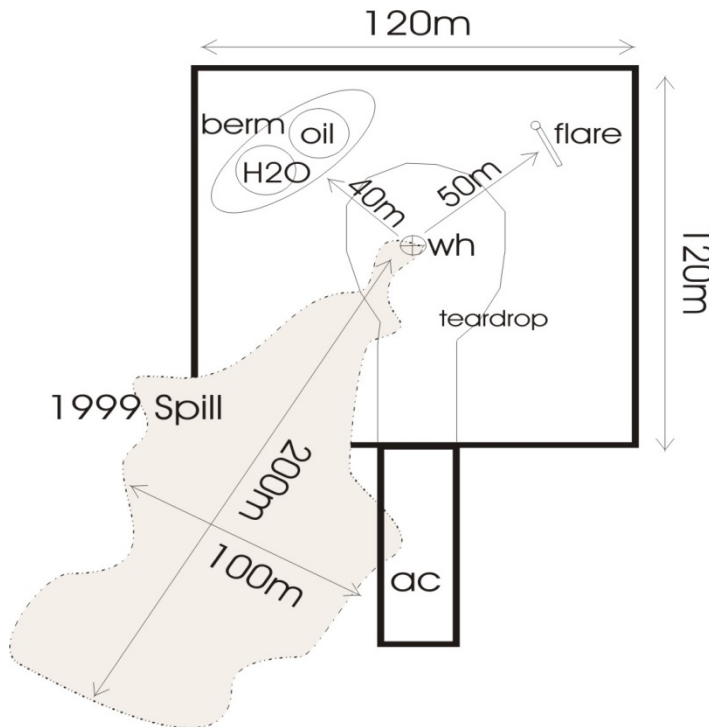
Construction Phase (mandatory for any site constructed since 1994)



At a minimum, indicate all of the following applicable information on both sketches:

Drainage/direction	
Wellhead	W/H
Berms	berm
Cut/fill	
Spoil	
Spills	spill
Trenches	tr
Access	ac
Topsoil Pile	
Subsoil Pile	
Sump	S
Flare Pit	fp
Tank Storage	
Teardrop	

Operations Phase



Appendix 4 Example Site Summary Diagrams

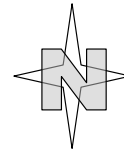
ATTACHMENTS: SITE INFORMATION - LEASE SKETCH

Operator		Soil Assessor		Vegetation Assessor	
Name(s): Operator - Gas Co		Joe Assessor		Mary Assessor	
ERCB Unique Well / facility Identifier(s):		Disposition #:		Location	
04-13-024-07 W4M		DISPOSITION #		NAD83	
				Well Center	
				Surface	
				Downhole	
Activity Dates (mm/dd/yr):		Soils		Vegetation	
Survey: 20-Jul-99		Construction: 20-Aug-99		Abandonment: 15-Jul-05	
Reclamation: 17-Aug-06		Soils: 15-Sep-06		Vegetation: 20-Aug-07	
Other: Vegetation 2: July 15, 2008					
Natural Sub-region		Ecosite:		Soil Zone	
Central Parkland		N/A		Eluviated Black Chern.	
Soil Series		Construction Practice:		Reclamation Practice:	
Malmo		2 Lift		Full Disturbance	

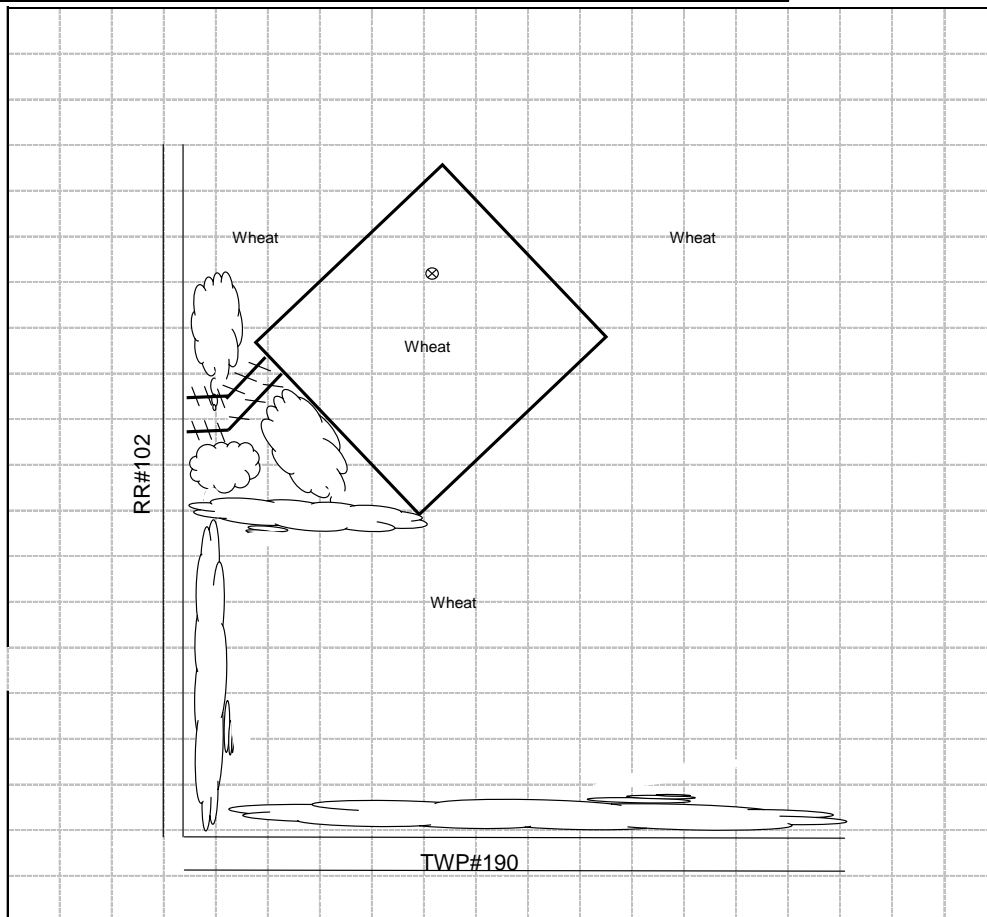
Environmental Setting

Legend:						
Drainage:	Access Road Boundary:	Lease Boundary:	Former Wellhead:	Trees / Brush:	Step Out:	Control Point: C#
						Site Point: S#

Abbreviations:	Landscape Criteria		Vegetation		Soil	
	E - Erosion	BA - Bare Areas	V - Site Vegetation Assessment Point	SS - Site Soil Assessment Point	T - Texture	
	C - Contour	PH - Poor Health Areas	VC - Vegetation Control Point	SC - Soil Control Point	G/R - Gravel / Rock	
	ST - Stability	G/R - Gravel / Rock	W - Weeds	AD - Admixing		
	D - Debris	PD - Poor Drainage	PH - Poor Health Areas	SPR - Soil Profile Restriction		



Crop On-site:	
On-site:	Wheat
North:	Wheat
East:	Wheat
South:	Wheat
West:	Wheat
Topography:	
Gently Undulating	
Typical Slopes:	
1-2%	
Usual Soil Moisture:	
Dry, 150-200 mm during growing season	
Soil Assessment Date:	
September 15, 2006	
Veg. Assessment Date:	
August 20, 2007	
Lease Area:	
1.3 ha	3.2 ac
110 m	X 110 m
Inspection Spacing	
Lease: 27.5 m X 27.5 m	
Access: Length: 100 m	



Notes:

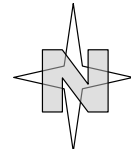
Notes:

ATTACHMENTS: SITE INFORMATION - LEASE SKETCH

Operator		Soil Assessor		Vegetation Assessor	
Name(s): Operator - Gas Co		Joe Assessor		Mary Assessor	
ERCB Unique Well / facility Identifier(s):		Disposition #:		Location	
04-13-024-07 W4M		DISPOSITION #		Well Center	
				Surface	
				Downhole	
Activity Dates (mm/dd/yr):		Soils		Vegetation	
Survey: 20-Jul-99		Construction: 20-Aug-99		Abandonment: 15-Jul-05	
Reclamation: 17-Aug-06		Soils: 15-Sep-06		Vegetation: 20-Aug-07	
Other: Vegetation 2: July 15, 2008					
Natural Sub-region		Ecosite:		Soil Zone	
Central Parkland		N/A		Eluviated Black Chern.	
Soil Series		Construction Practice:		Reclamation Practice:	
Malmo		2 Lift		Full Disturbance	

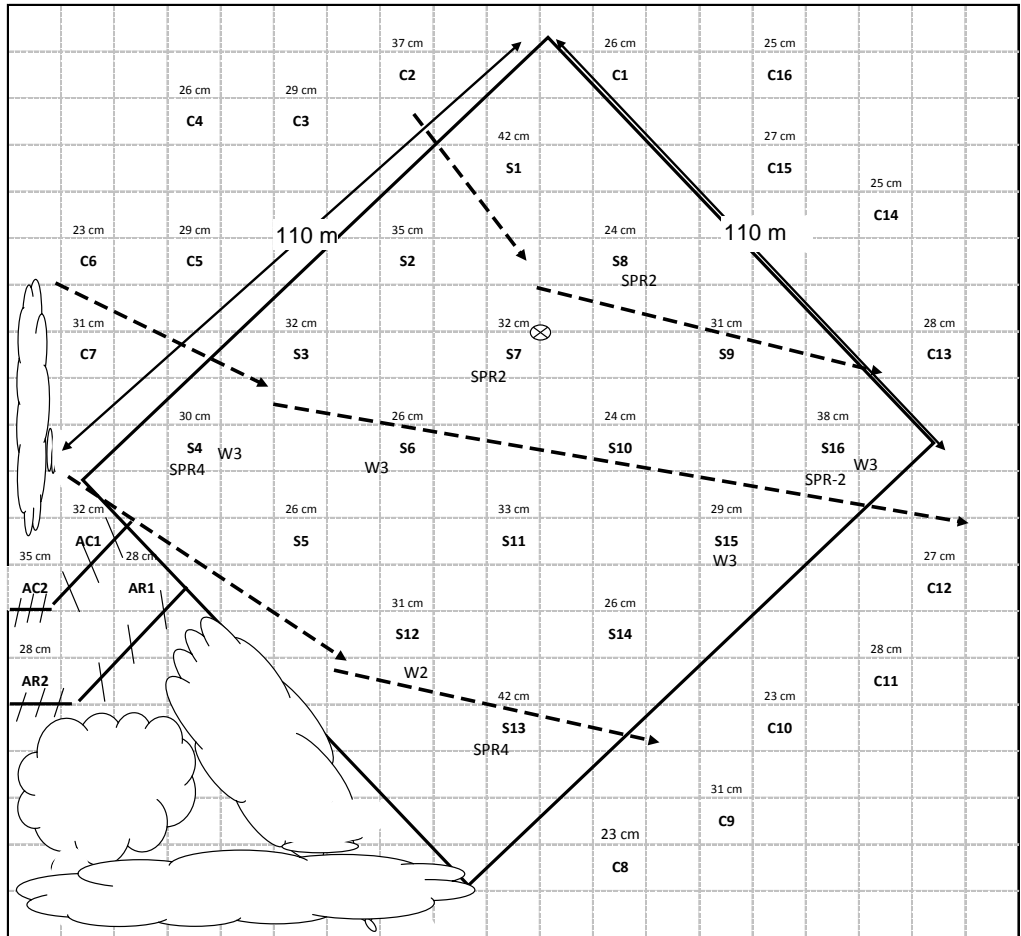
Environmental Setting

Legend:							
Drainage:	Access Road Boundary:	Lease Boundary:	Former Wellhead:	Trees / Brush:	Step Out:	Control Point: C#	Site Point: S#



Abbreviations:	Landscape Criteria		Vegetation		Soil	
	E - Erosion	BA - Bare Areas	V - Site Vegetation Assessment Point	SS - Site Soil Assessment Point	T - Texture	
	C - Contour	PH - Poor Health Areas	VC - Vegetation Control Point	SC - Soil Control Point	G/R - Gravel / Rock	
	ST - Stability	G/R - Gravel / Rock	W - Weeds	AD - Addmixing		
	D - Debris	PD - Poor Drainage	PH - Poor Health Areas	SPR - Soil Profile Restriction		

Crop On-site:	
On-site:	Wheat
North:	Wheat
East:	Wheat
South:	Wheat
West:	Wheat
Topography:	
Gently Undulating	
Typical Slopes:	
1-2%	
Usual Soil Moisture:	
Dry, 150-200 mm during growing season	
Soil Assessment Date:	
September 15, 2006	
Veg. Assessment Date:	
August 20, 2007	
Lease Area:	
1.31ha	3.21ac
110m	110m
Inspection Spacing	
Lease:	
27.5m	27.5m
Access:	
Length: 100m	



Notes: measurements shown are for topsoil depth.