

Halkirk 2 Wind Power Project Project Environmental Management Plan (PEMP)



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Version Tracking

Document Reference No.	Revision #	Date	Comments	Signatures
Capital Power_Halkirk 2_PEMP_Rev0	Rev0	Sept. 29, 2022	Issued for AUC Rule 007 Application	-
Capital Power_Halkirk 2_PEMP_Rev1	Rev1	Oct. 3, 2022	Re-Issued for AUC Rule 007 Application	-
Capital Power_Halkirk 2_PEMP_Rev2	Rev2	May 19, 2023	Re-issued for RFP process	Jennifer Bidlake Schroeder, M.Sc. Senior Specialist, Environment James Osness Senior Project Manager
Capital Power_Halkirk 2_PEMP_Rev3	Rev3	September 20, 2023	<p>Issued for Construction</p> <ul style="list-style-type: none"> Updated with V12 footprint figure. Minor modifications to text throughout. Add mitigations for working within 5 m of A wetland or waterbody. Amended clubroot cleaning mitigations when traversing between fields. Replace Environmental Sensitivity Mapbooks in Appendix A with Alignment Sheet placeholder. Added AUC Approval to the Appendix. Added Water Act Approvals to the Appendix. 	Jennifer Bidlake Schroeder, M.Sc. Senior Specialist, Environment James Osness Senior Project Manager

Document Reference No.	Revision #	Date	Comments	Signatures
Capital Power_Halkirk 2_PEMP_Rev4	Rev4	October 10, 2023	<p>Re-Issued for Construction</p> <ul style="list-style-type: none"> Updated clubroot mitigation measures for surveying, preconstruction testing, and construction 	 Jennifer Bidlake Schroeder, M.Sc. Senior Specialist, Environment  James Osness Senior Project Manager

1 Introduction

The Project Environmental Management Plan (PEMP) outlines environmental protection measures and mitigation to reduce, and limit potential adverse effects to the environment during the pre-construction, construction, and post-construction/operations phases of the Halkirk 2 Wind Power Project (the Project). For the purpose of this document, the entity who will construct and operate the Project is referred to herein as Capital Power Generation Services Inc., (Capital Power or CPC).

The Project consists of the construction and operations of a total nameplate installed capacity of approximately 139.5 megawatts (MW) wind power project located on a privately owned land approximately located approximately 110 km east of the City of Red Deer, Alberta within portions of Township 40 and 39, Ranges 14 and 15, west of the fourth meridian (W4M). The legal description of the quarter sections hosting the Project footprint are summarized and provided in Table 1 and detailed in Figure 1.

Table 1: Legal Land Description of the Quarter Sections Hosting the Project Footprint

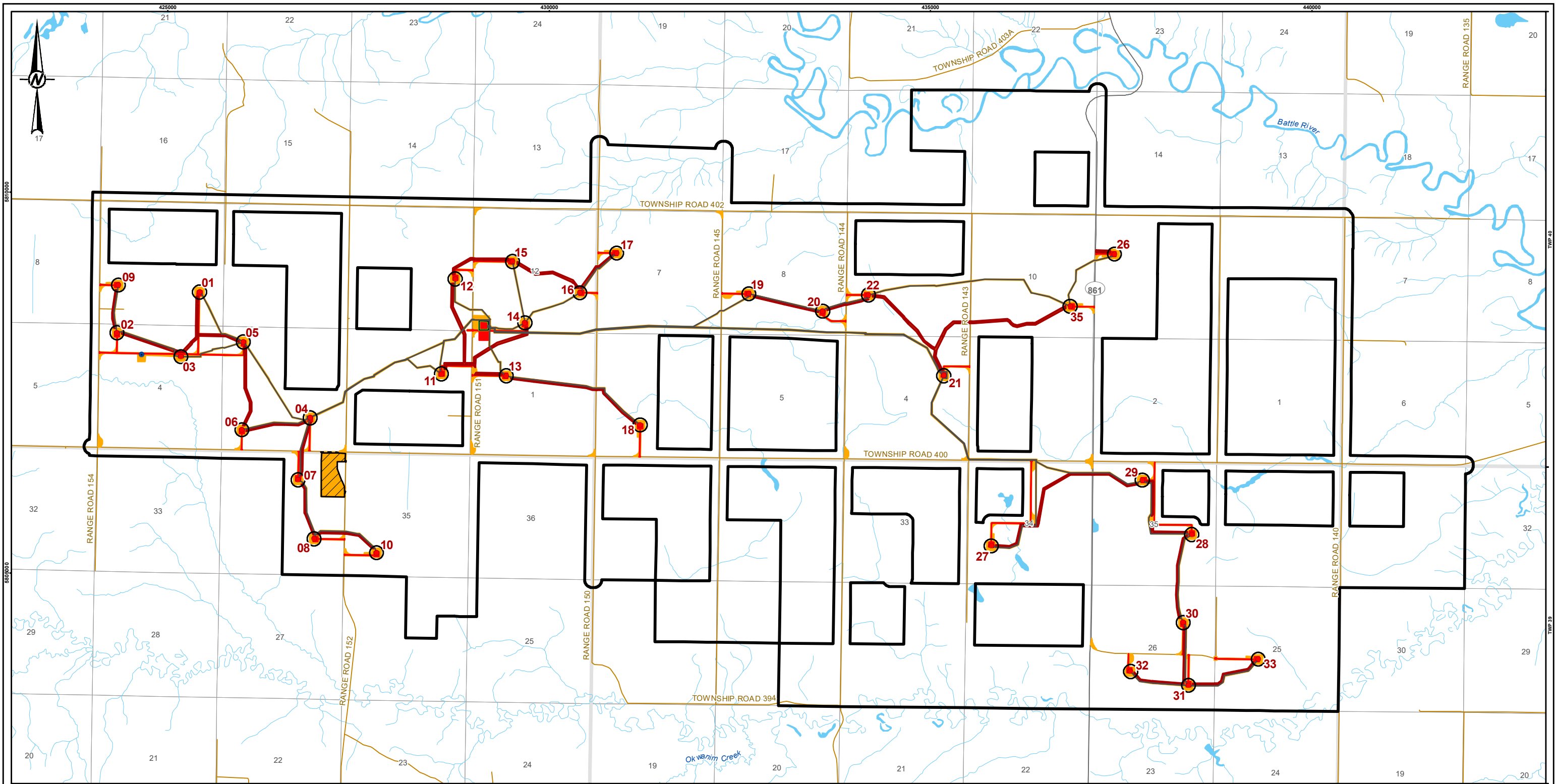
Quarter	Section	Township	Range	Meridian
SW ^(a)	1	40	15	W4M
NE	1	40	15	W4M
SE ^(a)	1	40	15	W4M
NW	1	40	15	W4M
NW	2	40	15	W4M
NE	2	40	15	W4M
SW	3	40	15	W4M
SE ^(a)	3	40	14	W4M
SE	3	40	15	W4M
NW	3	40	15	W4M
SE	4	40	14	W4M
SW	4	40	14	W4M
NW	4	40	15	W4M
NE	4	40	14	W4M
NW	4	40	14	W4M
NE	4	40	15	W4M
SW ^(a)	4	40	15	W4M
SW	6	40	14	W4M
NW	6	40	14	W4M
SE	7	40	14	W4M
SW	7	40	14	W4M
NW	7	40	14	W4M
NE ^(a)	7	40	14	W4M
SW	8	40	14	W4M
SE	8	40	14	W4M
SW	9	40	14	W4M
SE	9	40	14	W4M

Table 1: Legal Land Description of the Quarter Sections Hosting the Project Footprint

Quarter	Section	Township	Range	Meridian
SE	9	40	15	W4M
SW	9	40	15	W4M
SW	10	40	14	W4M
SE	10	40	14	W4M
NE	10	40	14	W4M
SE	11	40	15	W4M
NE	11	40	15	W4M
NW	11	40	14	W4M
SE	12	40	15	W4M
SW	12	40	15	W4M
NW	12	40	15	W4M
NE	12	40	15	W4M
SW	25	39	14	W4M
SE	26	39	14	W4M
NW ^(a)	26	39	14	W4M
SW	26	39	14	W4M
NE	26	39	14	W4M
SE	34	39	15	W4M
SW	34	39	14	W4M
NE	34	39	15	W4M
SE ^(a)	34	39	14	W4M
NE	34	39	14	W4M
SE	35	39	14	W4M
SW	35	39	15	W4M
SW	35	39	14	W4M
NW	35	39	14	W4M

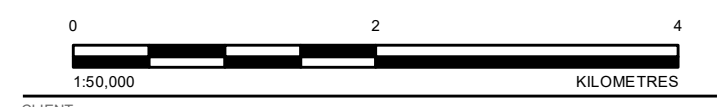
NW = northwest; NE = northeast; SE = southeast; SW = southwest; W4M = west of the fourth meridian (a) = quarter section only a temporary crane path or intersection improvement.

(a) = quarter section only a temporary crane path or intersection improvement. Some intersection improvements are limited to existing road allowances only.



LEGEND

PROJECT STUDY AREA	ROTOR-SWEPT AREA
SECONDARY HIGHWAY	PROJECT LAYOUT
LOCAL ROAD	METEOROLOGICAL TOWER
WATERCOURSE	TURBINE
WATERBODY	UNDERGROUND COLLECTOR SYSTEM
	CRANE PATH
	SUBSTATION
	TEMPORARY LAYDOWN
	OPERATION FOOTPRINT
	CONSTRUCTION FOOTPRINT



CLIENT	
CONSULTANT	WSP
YYYY-MM-DD	2023-09-01
DESIGNED	SC
PREPARED	LB
REVIEWED	SC
APPROVED	SC

REFERENCE(S)
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 PROJECTION: UTM ZONE 12 DATUM: NAD 83

PROJECT			
HALKIRK 2 WIND POWER PROJECT			
TITLE			
PROJECT FOOTPRINT OVERVIEW			
PROJECT NO.	CONTROL	REV.	FIGURE
21451763		4	1

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1.1 Project Components

The current layout contemplates up to 31 wind turbines. The Project’s permanent operational footprint (i.e., 30 years) will include turbines and associated turbine pad sites, access roads, substation, operation and maintenance (O&M) building, one permanent meteorological (MET) tower and one aircraft detection lighting system (ADLS) tower. The transmission line and interconnection are not included in the scope of this PEMP. Public roads (within municipal road allowances) will be used to access the Project.

The Project’s temporary footprint (construction footprint), required only during the construction period to install permanent infrastructure, will include temporary workspace for the storage of equipment or materials in a temporary laydown area, a temporary work area around the turbine locations and access roads, temporary crane paths, temporary right-of-way (ROW) for the installation of underground collector lines, and temporary intersection improvements.

The Project Study Area is approximately 7,160.6 ha of land. The Project Study Area includes sections and quarter sections of lands that could be potentially affected by development and includes road allowances connecting potentially affected lands, plus a 100 m buffer. Based on conservative (i.e., worst-case) estimates of the area of disturbance associated with Project infrastructure, the Project Footprint (i.e., operational and construction footprint) has the potential to adversely affect 208.1 ha of land (2.9%) within the Project Study Area during construction, of which 23.2 ha (0.3% of Project Study Area) will be permanently affected through to the operational stage.

1.2 Project Schedule

A preliminary Project Schedule is outline in Table 2. The Project Schedule will be revisited as regulatory approvals are received.

Table 2: Project Schedule

Milestone	Schedule
Regulatory Approvals Received	July 27, 2023 (AUC Approval 27691-D02-2023 and 27691-D03-2023)
Construction Start	October 5, 2023
Expected In-Service Date	January 2025

2 Purpose

This PEMP provides Project-related environmental protection measures and commitments to be implemented to comply with regulatory requirements and industry best practices during the pre-construction, construction, and operations phases of the Project.

The PEMP will be used to assist Capital Power with Project planning, and will be provided to all contractors, subcontractors and consultants before construction initiates. Capital Power will be responsible for distributing the PEMP and ensure mitigations are adhered to during construction and operation.

The PEMP is to be followed and implemented by Capital Power and contractors during pre-construction, construction, and post-construction/operations phases of the Project. Indefinite terms may be included in some environmental protection measures to provide flexibility and to accommodate unique situational circumstances where general environmental protection measures must be refined and applied as part of an adaptive management process.

The construction and operations of the Project will comply with all industry best practices, commitments made during the regulatory process, applicable codes, standards, regulations, and approval conditions.

The PEMP is based on:

- Consultation and ongoing engagement feedback from internal and external stakeholders.
- Biophysical field program results.
- Commitments made in Project-specific environmental documents (e.g., Alberta Environment and Parks [AEP], Renewable Energy Project Submission, Alberta Utility Commission [AUC] Rule 007 Application, Environmental Evaluation, Conceptual Conservation and Reclamation (C&R) Plan, responses to AEP and AUC information requests, permits and approvals).
- Professional experience.

3 Organization

This PEMP will be updated regularly as the Project design evolves or new information becomes available. Refer to the version tracking table at the beginning of this document for more information.

The PEMP is organized into the following sections:

- **Section 1:** Outlines the Project description.
- **Section 2:** Description of the purpose of the PEMP.
- **Section 3:** Describes where information can be found in the PEMP.
- **Section 4:** Summarizes the environmental setting of the Project.
- **Section 5:** Provides information about roles and responsibilities, measures required for environmental compliance, regulatory framework (authorizations, approvals, permits), and notification expectations prior to construction.
- **Section 6:** Details general protection measures through the pre-construction, construction, and post-construction/operations phases of the Project.
- **Section 7:** Describes post-construction compliance and reporting requirements for the Project.
- **Section 8:** Provides references cited in the PEMP.

4 Environmental Setting and Site Considerations

The Project is located on a privately owned land approximately 110 km east of the City of Red Deer, Alberta and 12 km north of Halkirk, Alberta.

The Project is with the Central Parkland Natural Subregion of the Parkland Natural Region (NRC 2006). Only about five percent of the Central Parkland Natural Subregion remains as native vegetation. These native areas are characterized by plains rough fescue prairie, with clumps of aspen within moist sites in the south and east. With higher precipitation to the north and west closed aspen (*Populus tremuloides*) forests occur with small grassland patches (NRC 2006). Native areas are generally dominated by plains rough fescue (*festuca hallii*), slender wheat grass (*Agropyron trachycaulum*), Western porcupine grass (*Stipa curtiseta*), June grass (*Koeleria macrantha*), needle-and-thread (*Stipa comata*), and blue grama (*Bouteloua gracilis*) (NRC 2006). Shrub communities typically only occur in moderately well drained sites in moister locations. Shrub communities in these areas typically consist of buckbrush (*Symphoricarpos occidentalis*), silverberry (*Elaeagnus commutate*), prickly rose (*Rosa acicularis*), chokecherry (*Prunus virginiana*), and saskatoon (*Amelanchier alnifolia*) (NRC 2006). Aspen communities vary based on parent material and moisture. In the southeast they are restricted to imperfectly drained depressions, as precipitation increases to the north and west they become dominant (NRC 2006).

The Project Footprint is dominated by modified vegetation types including cultivation (~67%) and tame pasture or hay (~31%). Wetlands and waterbodies represent ~2% of the Project Footprint, and aspen and mixed forest represent <1%.

Graminoid marshes were the most frequently observed wetland type in the Project Study Area. Plant species associated with the wetlands in the Project Study Area included common cattail (*Typha latifolia*), dock species (*Rumex* spp.), foxtail barley (*Hordeum jubatum*), reed canary grass (*Phalaris arundinacea*), slough grass (*Beckmannia syzigachne*), and sedge (*Carex* sp.) species. Provincially regulated weed species observed in the transition zone between wetland vegetation and adjacent, upland vegetation (often cultivated or tame pasture or hay) included Canada (creeping) thistle (*Cirsium arvense*), perennial sow thistle (*Sonchus arvensis*), summer-cypress (*Kochia scoparia*), common dandelion (*Taraxacum officinale*), and common goat's beard (*Tragopogon dubius*).

The topography within the Project Footprint is typically level to gently undulating. The Battle River is located approximately 2 km north of the Project Footprint. Elevations range from approximately 725 metres above sea level (masl) in the east to approximately 760 masl in the west section of the Project Footprint.

5 Environmental Compliance

5.1 Regulatory Framework

Specific environmental or cultural authorizations and approvals required for the Project and their status are outlined in Table 5. This does not include non-environmental related authorizations such as those for NAV Canada, Transport Canada, Alberta Transportation or Development Permit issued through the County of Paintearth.

Table 3: Environmental Authorizations and Approvals for the Halkirk 2 Wind Power Project

Regulator	Act or Regulation	Application	Authorization/Approval Status
Provincial			
Alberta Environment and Parks (AEP)	<i>Water Act</i>	<i>Water Act</i> Application for Wetland disturbance, including a Wetland Assessment and Impact Report (WAIR) or Wetland Assessment and Impact Form (WAIF)	<i>Water Act</i> approvals and <i>Code of Practice</i> Notifications will be required for permanent or temporary wetland disturbance prior to 2023 construction. A <i>Water Act</i> application for permanently impacted wetlands was submitted and approved on June 6, 2023. A Wetland Assessment and Impact Form (WAIF) was submitted for temporarily impacted wetlands on August 18, 2023. Approval is anticipated prior to construction start. A separate Code of Practice Notification will be submitted for collector line crossings in Q4 2023.
	<i>C&R Directive for Renewable Energy Operations (C&R Directive) (AEP2018a)</i>	Conservation and Reclamation (C&R) Plan Soil and Vegetation Management Plan	The Conceptual C&R Plan has been developed for the Project. A Soil and Vegetation Management Plan (SVMP) has been developed and included as an attachment to this document.
	<i>Fish and Wildlife Stewardship (AEP-FWS)</i>	Referral Report	AEP-FWS issued an amended Referral Report for the Project on June 16, 2022. The Referral Report is valid until June 16, 2027. The report is included as an attachment to this document.
Alberta Culture, and Status of Women (ACSW)	<i>Historical Resources Act (HRA)</i>	Historic Resources (HR) Application	HRA Approval was issued on June 22, 2022 (HRA #4941-16-0008-003). The approval is included as an attachment to this document.

Table 3: Environmental Authorizations and Approvals for the Halkirk 2 Wind Power Project

Regulator	Act or Regulation	Application	Authorization/Approval Status
Alberta Utilities Commission (AUC)	<i>Hydro and Electric Energy Act (HEEA)</i>	Alberta Utilities Commission Rule 007 Facility Application	<p>A permit and license were received from the AUC on July 27, 2023:</p> <ul style="list-style-type: none"> • Power Plant Approval 27691-D02-2023 • Substation Permit and License 27691-D03-2023 <p>Capital Power filed the required AUC Final Project Update on August 25, 2023.</p> <p>Subsequent changes made to the Project Footprint after August 25, 2023 may require additional review from the AUC.</p> <p>AUC Approval is provided in Appendix A.</p>

5.2 Roles and Responsibilities

Key roles and responsibilities during operation of the Projects are described in Table 3. These are based on items including but not limited to commitments, regulatory approval conditions, industry best practices and Capital Power standards including standards and procedures. The typical organizational chart for environmental related responsibilities is outlined in Figure 2. Responsibilities for each role should be assigned prior to operation and a Project-specific contact list is attached as Appendix B.

Figure 2: Organization Chart for Environment-Related Responsibilities

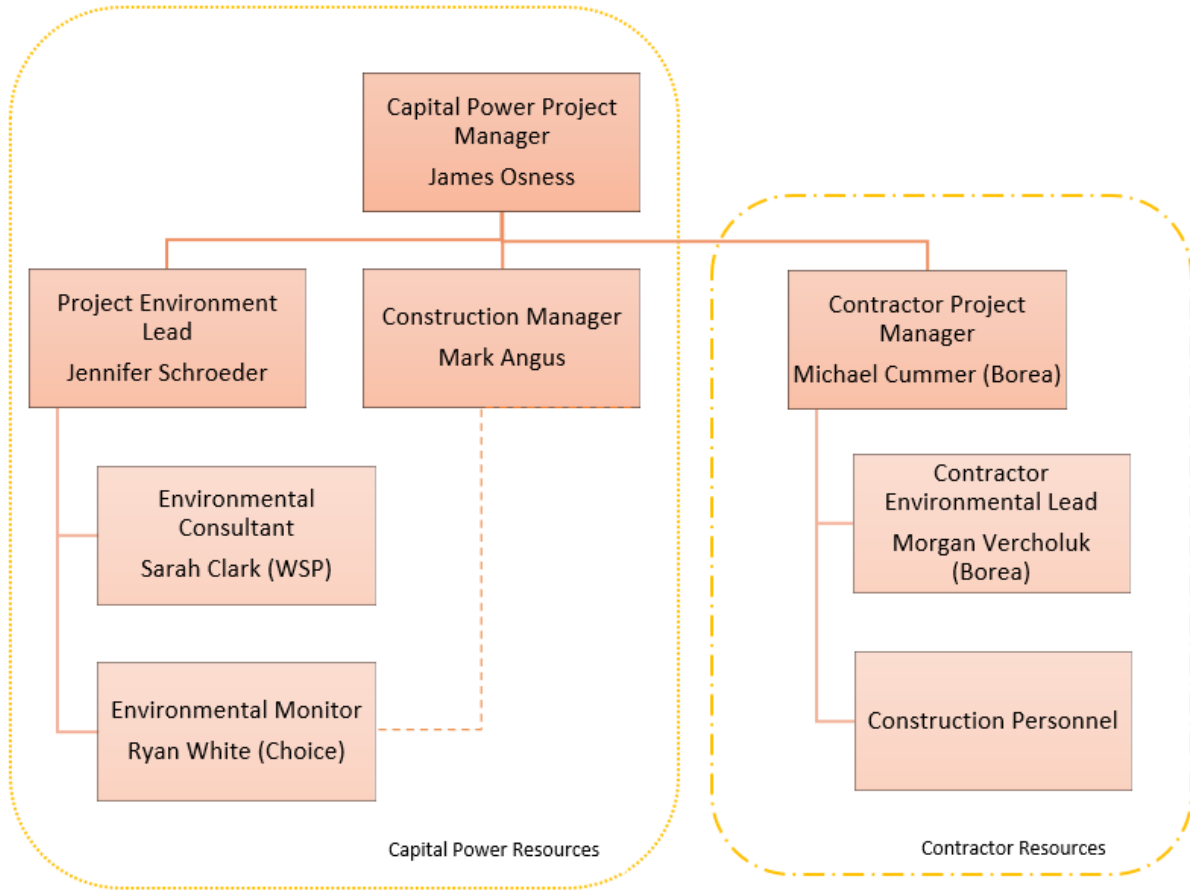


Table 3: Roles and Responsibilities During Construction

Role	Environmental Responsibilities
Capital Power Project Manager (CP PM)	<p>The CP PM has overall accountability for the successful execution of the project, including contractor performance and compliance with all environmental requirements. The CPC PM is typically based at the Capital Power Head Office in Edmonton.</p> <p>With respect to environmental aspects of the project, specific responsibilities include:</p> <ul style="list-style-type: none"> • Leads the construction team in a manner that is consistent with Capital Power’s HSE Policy and commitments to environmental protection and stewardship. • Establishes a project team structure, communicates high-level environmental performance expectations, and identifies and acquires the necessary resources to ensure the project is constructed in compliance with all environmental requirements. • Understands project-specific environmental requirements and ensures that the project and contractor(s) meet these requirements. Enforces regulatory compliance within the Project team. • Establishes communication interfaces for environmental aspects of the project and resolves escalated issues. • Communicates and regularly reinforces the importance of environmental compliance to all team members. • In consultation with the Environment Lead (CP EL), monitors and determines acceptable levels of risk related to uncertainties or subjectivity in environmental requirements. • Ensures environmental requirements are appropriately reflected in project contracts. • Monitors and confirms that contractors understand and deliver on project environmental requirements. Enforces contractual environmental requirements. • Oversees response to environmental incidents. • Establishes and utilizes systems to track and report on environmental compliance and performance throughout the life of the Project. • Involves the CP EL and other appropriate subject matter experts (SME’s) in decision making for project or execution plan changes that may have environmental implications. • Resolves escalated environmental compliance issues and trends. • Resolves any construction and environmental issues that may arise during construction of the Project.

Table 3: Roles and Responsibilities During Construction

Role	Environmental Responsibilities
<p>Capital Power Environmental Lead (CP EL)</p>	<p>The CP EL has primary functional responsibility for establishing, communicating, and supporting adherence to project environmental requirements. The CP EL reports to the CP PM and is based at the CP Office in Calgary.</p> <p>Specific responsibilities of the CP EL include:</p> <ul style="list-style-type: none"> • Identifies and documents project environmental requirements. • Establishes a project environment team (internal and consulting resources); identifying the necessary resources to achieve project requirements. • Develops permitting strategy and obtains environment-related regulatory permits, approvals, and authorizations. • Functions as the primary point of contact and manages communications with federal, provincial, state, and/or local environmental regulators. • Manages environmental consulting, inspection, and compliance resources. Ensures these resources work proactively and collaboratively with the project team. • Manages OEM's performance and quality of deliverables. • Oversees the preparation of and updates to the PEMP. • Provides training, as necessary, to appropriate project personnel. • Reviews environmental aspects of contract documents. • Establishes and oversees a reporting system to identify, investigate and resolve project environmental incidents. • Works with the PM, CM and contractors to resolve challenging or disputed environmental compliance matters and to develop acceptable solutions. • Supports response to environmental incidents. • Coordinates environmental reviews/audits and provides support to. • internal and external audits as required; oversees implementation of corrective action plans. • In consultation with the project team, develops environmental performance monitoring processes, targets, and metrics as appropriate. • Maintains project environmental documentation and records.
<p>Capital Power Construction Manager (CM)</p>	<p>The CP CM has overall accountability for the successful execution of the project, including contractor performance and compliance with all environmental requirements. The CP CM reports to the CP PM and is typically based at the Construction Site.</p> <p>With respect to environmental aspects of the project, specific responsibilities include:</p> <ul style="list-style-type: none"> • Leads the construction team in a manner that is consistent with Capital Power's HSE Policy and commitments to environmental protection and stewardship. • Establishes a team structure, communicates high-level environmental performance expectations, and identifies and acquires the necessary resources to ensure the project is constructed in compliance with all environmental requirements. • Understands project-specific environmental requirements and ensures that the project and contractor(s) meet these requirements. Enforces regulatory compliance within the Project team. • Establishes communication interfaces for environmental aspects of the project and resolves escalated issues. • Communicates and regularly reinforces the importance of environmental compliance to all team members. • In consultation with the Environment Lead (CP EL), monitors and determines acceptable levels of risk related to uncertainties or subjectivity in environmental requirements. • Monitors and confirms that contractors understand and deliver on project environmental requirements. Enforces contractual environmental requirements. • Oversees response to environmental incidents. • Involves the CP EL and other appropriate SME's in decision making for changes that may have environmental implications. • Resolves escalated environmental compliance issues and trends. • Resolves any construction and environmental issues that may arise during construction of the Project.

Table 3: Roles and Responsibilities During Construction

Role	Environmental Responsibilities
Capital Power Environmental Consultant (CP EC)	<p>The EC supports the Capital Power construction team and helps ensure the successful execution of the project. The EC team reports to the CP EL and is typically based off-site at the consultant's office.</p> <p>With respect to environmental aspects of the project, specific responsibilities include:</p> <ul style="list-style-type: none"> • Provides environment SME advice to the project team. • Assists with the preparation of regulatory applications and project documents, as requested. • Understands the environmental approval conditions of the Project during construction and supports Capital Power with compliance of these, as requested.
Capital Power Environmental Monitor (CP EM)	<p>The EM supports the construction team by providing on-site oversight and support for construction activities. The OEM is typically Capital Power's initial 'go-to' resource for on-site environmental matters. The EM reports to the CP EL and works very-closely with the on-site construction team. The EM is typically based at the construction site and, depending upon project complexity and risk, may be dedicated to the project on a full-time basis or visit the site as required.</p> <p>Specific responsibilities of the EM include:</p> <ul style="list-style-type: none"> • Monitors and verifies (contractor) compliance with all environmental requirements for the Project. • Works with and proactively advises CP project management, contractor(s) and inspection team to ensure environmental requirements are understood and met. • Oversees Environmental Awareness training for all workers on the Project. • Participates in regularly scheduled construction planning meetings, project team meetings, and daily 'plan of day' meetings. • Proactively assesses, communicates, and reinforces environmental requirements for ongoing and upcoming work; works with the contractor to identify solutions to environmental concerns. • Monitors contractor implementation of environmental mitigation and control measures, and corrective actions if necessary. • Prepares and maintains environmental inspection reports and documentation. • Based on developments or changes in construction plans in the field, identifies if approval variances or revised mitigation strategies are required, and assists in the development of such strategies. • Supports response to environmental incidents. • Recommends shut down of select activities in the field, where events, if not corrected, would likely result in environmental damage or non-compliance. • Engages the CP EL, CM and PM if environmental concerns have not been effectively resolved in the field. • Assists CP EL as a point of contact for regulatory representatives. <p>The CP EM does not have the authority to provide direction to the contractor(s). All direction to contractors must be provided by the PM or CM.</p>

Table 3: Roles and Responsibilities During Construction

Role	Environmental Responsibilities
<p>Contractor Project or Construction Manager (Contractor PM or CM)</p>	<p>The construction contractor’s leadership (Project or Construction Manager) has a critical role in ensuring Project environmental requirements are met.</p> <p>As the contractor plans and oversees the execution of construction activities, the contractor has a unique ability to influence Project environmental outcomes. The contractor is responsible to understand and fully comply with all Project environmental requirements. The contractor shall work closely with the Capital Power project team and ensure that the contractor and any subcontractors provide the necessary resources, undertake the necessary planning, and develop and implement the necessary plans, processes, and controls to meet all Project requirements.</p> <p>Without limitation, this includes requirements described in the PEMP, approval permit requirements, as well as any other applicable contractual or regulatory requirements.</p> <p>Specific responsibilities of the construction contractor(s) include:</p> <ul style="list-style-type: none"> • Leads the contract construction team in a manner that is consistent with the contractor’s and Capital Power’s HSE Policy and commitments to environmental protection and stewardship: <ul style="list-style-type: none"> • Establishes a team structure, communicates environmental performance expectations, and commits qualified environmental resources to ensure the project is constructed in compliance with all project regulatory and contractual requirements. • Understands project-specific environmental requirements and ensures that these are met. Enforces compliance within the construction team. • Provides Environmental Awareness training for all workers. • Schedules work to mitigate environmental impacts. • Communicates and regularly reinforces the importance of environmental compliance to all contractors. • Involves the Capital Power construction team and other appropriate SME’s in decision making when unanticipated issues or changes that may have environmental implications arise. • Identifies, immediately reports, responds to, and effectively mitigates any environmental incidents that may occur.
<p>Contractor Environmental Lead (CEL)</p>	<p>The contractor EL (CEL) is the contractor’s primary environmental SME. The CEL is an important member of the contractor’s team and supports the contractor with the attainment of the project’s environmental goals.</p> <p>Specific responsibilities of the CEL include:</p> <ul style="list-style-type: none"> • Understands project environmental requirements, commitments and mitigations. • Supports development of construction plans, ensuring environmental requirements and appropriate mitigation measures are implemented. • Manages contractor environmental resources (biologists, inspectors etc.). Ensures these resources work proactively and collaboratively with the contractor team. • Oversees or provides environmental training, as necessary, to appropriate project personnel. • Facilitates reporting, investigation and resolution of environmental incidents. • Works with the contractor team to proactively identify and resolve environmental compliance matters. • Coordinates or conducts inspections. • Manages environmental performance metrics. • Oversees the preparation of and updates to contractor environmental documents. • Maintains project environmental documentation and records.
<p>Construction personnel</p>	<p>All personnel working on the project contribute to the achievement of the project’s environmental goals.</p> <p>All personnel are responsible to:</p> <ul style="list-style-type: none"> • Complete environmental orientation and awareness training. • Understand and implement environmental protection requirements applicable to their scope of work. • Report environmental incidents and events.

Table 3: Roles and Responsibilities During Construction

Role	Environmental Responsibilities
Operations Phase Only	
Operations Manager (CP OM)	<p>The CP OM has overall accountability for the operational performance of the project, including the project’s environmental performance. The CP OM is typically based at the site, or at a similar Capital Power site.</p> <p>With respect to environmental aspects, specific responsibilities include:</p> <ul style="list-style-type: none"> • Accountable for the successful operation of the facility. • Leads the operations team in a manner consistent with Capital Power’s HSE Policy and requirements. • Leads the operations team in a manner consistent with the project’s regulatory requirements and environmental commitments. • Manages environmental compliance with approvals and permits throughout operation of the Project. • Ensures all contractors have the adequate training and are qualified to work at the facility. • Enforces regulatory compliance at the site. • Resolves any environmental issues that may arise during Project operations. • Ensures all contracts and contractors reflect project environmental requirements.
Capital Power Environmental Specialist / Advisor (CP ES)	<p>The CP ES has primary functional responsibility for establishing, communicating, and supporting adherence to project environmental requirements. The CP ES supports reports to the CP OM and is typically based at the CP Head Office in Edmonton or in a local business office.</p> <p>Specific responsibilities of the CP ES include:</p> <ul style="list-style-type: none"> • Supports specialist environmental support to CP OM. • Manages post-construction environmental requirements (monitoring programs, etc.). • Functions as the primary point of contact and manages communications with federal, provincial, state, and/or local environmental regulators. • Manages environmental consulting, inspection, and compliance resources. • Manages project environmental documentation. • Provides training, as necessary, to appropriate project personnel. • Reviews environmental aspects of contract documents. • Supports the CP OM with incident management. • Works with CP OM to resolve emerging environmental compliance matters and to develop acceptable solutions. • Coordinates environmental reviews/audits and provides support to internal and external audits as required; oversees implementation of corrective action plans. • Maintains project environmental documentation and records.

5.3 Notifications

Table 4 details notification expectations to relevant stakeholders, regulators, and landowners before, during, and after construction of the Project.

Table 4: Environmental Notification Requirements for the Halkirk 2 Wind Power Project

Contact	Commitment Measures
Regulatory Agencies	<ul style="list-style-type: none"> Notify all relevant federal, provincial, and municipal entities prior to start of construction in accordance with any approval or permit requirements. Notify all relevant federal, provincial, and municipal entities of any material changes to the Project schedules and plans.
Federal	
Environment and Climate Change Canada (ECCC)	<ul style="list-style-type: none"> Notify the ECCC area biologist of any wildlife mortalities of federally listed species.
Provincial	
AEPA	<ul style="list-style-type: none"> Notify the AEPA – FWS area biologist of any wildlife mortalities and the results of any construction and post-construction wildlife monitoring at the relevant frequency. If there any watercourse crossings, collector line crossings that intersect wetlands, ephemeral waterbodies or natural drainages, or horizontal directional drills under wetlands or watercourses associated with the Project, the applicable Code of Practice notification would be required by AEP 14 days prior to initiating construction activities.
Alberta Culture	<ul style="list-style-type: none"> The discovery of archaeological resources, palaeontological resource, historic structures or Aboriginal traditional use sites are to be reported to Alberta Culture (AC).
AUC	<ul style="list-style-type: none"> Capital Power will submit environmental notifications to the AUC as required by the Project permit of licence.

5.4 Change Management

If a conflict arises between environmental protection requirements in any document (i.e., regulatory application, approval, construction contract, PEMP, etc.), the more rigorous protection measure will apply.

If, during either during construction or operation, it is determined that an environmental protection measure cannot be met, or if new or altered procedures are required to address unanticipated site conditions:

- Pause the activity until an alternative measure has been identified and approved.
- Contact the CP Project / Construction / Operations Manager and Capital Power Environmental Lead immediately.
- In consultation with the Capital Power and contractor team, develop a modified procedure / mitigation to address the change.
- Ensure the solution does not conflict with regulatory, permitting, and/or authorization conditions.
- Consider the need for consultation with regulatory agencies and other stakeholders; review issue and proposed plan with applicable regulators, if required.
- Document the decision and communicate the solution all necessary parties.
- Implement the approved solution & monitor for effectiveness.

6 Environmental Protection Measures

The environmental protection measures for development projects in Alberta that apply to the Project through pre-construction, construction, and post-construction/operations are described in Section 6.0. Environmental Alignment Sheets outlining environmental sensitivities (i.e., wetlands, wetland setbacks, wildlife nests and dens) and key environmental mitigations is provided in Appendix C. Detailed mitigation measures are discussed in Section 6.1 – 6.9.

6.1 Spill Prevention and Response

6.1.1 Prevention and Response

Table 5: Spill Prevention and Response

Activity	Mitigation
Pre-Construction	
Procedures	<ul style="list-style-type: none"> Capital Power will require that all contractors have standard fuelling procedures that minimize the risk of spills and leaks, and include spill containment, reporting, and clean-up measures. Measures will be taken to prevent the release of fuel, lubricating fluids, hydraulic fluids, antifreeze, or any other chemicals onto ground or into waterbodies.
Construction, Post-Construction and Operations	
Reporting	<ul style="list-style-type: none"> All Project activities will follow standard construction practices and applicable laws to minimize the potential for and effect of any spills. Any spill, release, or emergency that may cause, is causing or has caused an adverse effect to the environment will be immediately reported by the party responsible to Alberta Environment and remediated in a timely manner in compliance with Alberta regulations (GOA 2016a). Capital Power will log all spills or releases, regardless of volume, in the online Maximo tracking database.
Plans and Inspection	<ul style="list-style-type: none"> All Project-related staff will have an understanding of the Spill Contingency Plan (Table 8) and notification requirements. A Spill Prevention and Control inspection will be completed as required.
Access	<ul style="list-style-type: none"> Permanent spill control measures will be employed around facilities and access roads. Vehicle and equipment that enter the Project site will be clean in good working order (i.e., no oil or hydraulic fluid leaks). Heavy equipment parked or stored requires a drip-tray to prevent release to the environment when not attended by an operator or contractor.
Storage	<ul style="list-style-type: none"> Label all hazardous materials stored on the Project Site according to Workplace Hazardous Materials Information System (WHMIS) guidelines. Fuel storage tanks shall be in accordance with the Alberta Fire Code, Part 4 (National Research Council of Canada 2019) and registered with the Petroleum Tank Management Association of Alberta, if required. Aboveground storage tanks (ASTs) shall be positioned in such a way that the AST is protected from impact or rupture using berms, bollards, or barriers. Dikes or secondary containment-type tanks shall be used for storage of hazardous liquids onsite to control spills. The volume of the dike shall be capable of holding 110% of the greatest amount of liquid that can be released from the largest tank within the storage area, assuming a full tank.

Table 5: Spill Prevention and Response

Activity	Mitigation
Equipment Refuelling and Services	<ul style="list-style-type: none"> No vehicle and equipment refuelling, maintenance, or washing will occur within 100 m of a wetland or water body. All fuelling systems shall have break-away nozzles, automatic shutoffs, and all fuelling activities must be done and monitored by worker in attendance. Perform all equipment servicing, such as oil changes and hydraulic repairs with potential for spills over an impervious tarp to contain spills.
Supplies and Training	<ul style="list-style-type: none"> An adequate supply of spill prevention and emergency response equipment will be on the Project site at all times, and personnel will be trained in hazardous materials handling and emergency response procedures.

Table 6: Spill Clean-Up Plan

Activity	Mitigation
Spill Clean-Up	<ul style="list-style-type: none"> Stop and contain the spill or release. Remove affected soil, keeping separate from clean/non contaminated soil. Clean equipment or infrastructure affected by the spill. Dispose of all contaminated material into contaminated soils bin or approved disposal site in accordance with applicable legislation. Place affected absorbent material into hazardous materials container. Remediate or reclaim the affected area.

Table 7: Spill Contingency Plan

Activity	Mitigation
Notification	<ul style="list-style-type: none"> Capital Power Environmental Lead (CP EL) and Environmental Monitor (CP EM) will be immediately notified in the event that there is potential for groundwater contamination, or the spill quantity is at a reportable level. The responsible contractor will report the incident to Alberta Environment and Parks as per reportable spill quantities outlined in Schedule 1 of the <i>Environmental and Protection Enhancement Act (EPEA) Release Reporting Regulation</i> (GOA 1993; Appendix D). Refer to Appendix E for the <i>EPEA Release Reporting Guide</i>, which may be amended from time to time. Spills must be immediately reported to Alberta Environment and Parks Environmental Response Line by calling 1-800-222-6514. A description of the location and time of the release, the type and quantity of the substance released, the details of any action proposed or taken at the release site, and a description of the immediate surrounding area will be required. A written report will be submitted within 7 days of the immediate report as per the Reporting Spills and Releases (GOA 2016a) for all reportable spills. Capital Power Environmental Lead will track all spills or releases in the online Maximo tracking system.

6.2 Stormwater Management

Table 8: Stormwater Management

Activity	Mitigation
Construction, Post-Construction and Operations	
Inspection	<ul style="list-style-type: none"> Stormwater management procedures will be prepared for the Project prior to construction.
Runoff	<ul style="list-style-type: none"> Drainage will be designed to contain and/or limit potential runoff from directly entering waterbodies.

6.3 Hazardous Materials and Waste Management

Table 9: Hazardous Materials and Waste Management

Activity	Mitigation
Pre-Construction	
Waste Management Program	<ul style="list-style-type: none"> A waste management program including waste minimization, material reuse, recycling of packaging materials and waste metals will be developed and implemented.
Construction	
Waste Disposal	<ul style="list-style-type: none"> Domestic garbage will be properly stored and disposed of so as not to attract wildlife. During Project clean-up, waste will be removed from the Project sites, recycled if possible, or disposed of at an approved facility. Garbage and debris will be collected and disposed of at an approved location.
Hazard Materials Storage	<ul style="list-style-type: none"> All hazardous materials stored on the Project sites (e.g., fuel) will be labelled, stored, and handled according to Workplace Hazardous Materials Information System (WHMIS) regulations. All hazardous material will be disposed of through licenced contractors. No combustible material shall be stored within ten feet (3 m) of a building or structure. Portable fire extinguishing equipment suitable for the fire hazard involved shall be provided at convenient, conspicuously accessible locations in the construction areas. Approved safety cans (metal, pressure relieving top, spark arrestor) shall be used for handling and use of flammable/combustible liquid quantities of 5 gallons (19 L) or less. No more than 25 gallons of flammable/combustible liquids can be stored outside of an approved cabinet. All Storage cabinets containing flammable liquids shall be labelled, "Flammable – Keep Away". At least one portable fire extinguisher with a rating of not less than 20 B units shall be located outside of, but not less than 25 feet (8 m) nor more than 50 feet (15 m) from any flammable liquid storage area located outside. At least one portable fire extinguisher with a rating of not less than 20 BC units shall be provided on all tank trucks or other vehicles used for transporting or dispensing flammable or combustible liquids. Dispensing units shall be protected against collision damage and be auto-closing and without a latch-open device. Flammable liquids shall be kept in closed containers when not actually in use. Flammable/combustible liquids shall be stored in approved containers or tanks.

Table 9: Hazardous Materials and Waste Management

Activity	Mitigation
Transfer of Hazardous Materials	<ul style="list-style-type: none"> • Areas in which flammable or combustible liquids are transferred at one time, in quantities greater than 5 gallons (19 L) from one tank or container to another tank or container shall be separated from other operations by 25 feet (8 m) in distance. Spill kits shall be provided to contain spills. • Transfer of flammable liquids from one container to another should be performed when containers are electrically interconnected or bonded. • Tank trucks shall comply with NFPA No. 385-1966 (NFPA 2017). • Clearly identified and easily accessible switches shall be provided at a location remote from the dispensing devices to shut off the power to all dispensing devices in the event of an emergency. • Highly visible and legible signs prohibiting smoking or open flames shall be posted in the fuel storage and dispensing area.
Release of Hazardous Materials	<ul style="list-style-type: none"> • Leakage or spillage of flammable or combustible liquids should be disposed of promptly and safely. • The Spill Clean Up Plan and Spill Contingency Plan (Table 6 and Table 7) will be followed in the event of a substance release.
Use of Hazardous Materials	<ul style="list-style-type: none"> • Flammable/combustible liquids may only be used where there are no open flames or other source of ignition within 50 feet (15 m) of operation. • There shall be no smoking or open flames in the areas used for: <ul style="list-style-type: none"> a) Fuelling. b) Servicing fuel systems for internal combustion engines. c) Receiving fuel. d) Dispensing of flammable/combustible liquids. • The motors of all equipment being fuelled shall be turned off during fuelling.
Post-Construction and Operations	
Waste Disposal	<ul style="list-style-type: none"> • Domestic garbage will be properly stored and disposed of so as not to attract wildlife. • Garbage and debris will be collected and disposed of at an approved location. • Used oil and other wastes will be disposed of at an approved facility following each maintenance visit.
Storage	<ul style="list-style-type: none"> • All hazardous materials stored on the Project site (e.g., fuel) will be labelled, stored, and handled according to Workplace Hazardous Materials Information System (WHMIS) regulations. All hazardous materials will be disposed of through licensed contractors. • No combustible material shall be stored within 10 feet (3 m) of a building or structure. • Portable fire extinguishing equipment suitable for the fire hazard involved shall be provided at convenient, conspicuously accessible locations in the yard.

6.4 Emissions and Dust Control

Table 10: Emissions and Dust Control

Activity	Mitigation
Construction	
Emission and Dust Control	<ul style="list-style-type: none"> • Stationary and mobile equipment will adhere to federal emission standards and will be regularly maintained. There are no Alberta emission standards for non-road diesel mobile equipment. • Cover materials that contain loose particles that have the potential to go airborne, as appropriate. • Use water (or other appropriate methods) for dust suppression on soil piles, exposed soil surfaces, or other areas prone to wind erosion: <ul style="list-style-type: none"> • Water from trenches and excavations can be used for dust control, if required. • Water for dust control will be used from approved sources only. • Use of other substances for longer-term dust management will be considered, such as straw, mulch, tackifier, seeding, and temporary tarping. • Use alternatives to water on roads if evaporation is too rapid, such as calcium chloride. Calcium chloride shall not be used in agricultural field or natural areas and limited to roadways only. • Use of alternatives may be confined to specific intersections and homes/residences, or further depending on traffic requirements in specific areas during construction). • Trucks carrying open loads will be tarped if required. • Project traffic will be restricted to public road allowances, temporary workspaces or the Project footprint. • Project traffic will adhere to posted speed limits on public roads, public road bans, and reduced speed limits will be implemented on. • Project access roads: Capital Power has committed to limit construction speed to 50km/hr in the Project Area. Capital Power is committed to and will enforce speed limits with all contractors. • Dust control measures will be undertaken as per any executed Road Use Agreement with County of Paintearth No. 18.
Operations	
Emission and Dust Control	<ul style="list-style-type: none"> • Project traffic will adhere to posted speed limits on Project roads and public roads.

6.5 Noise Control

Table 11: Noise Control

Activity	Mitigation
Construction	
Noise Control	<ul style="list-style-type: none"> • Vehicle and equipment will be well maintained to limit engine noise. • Noise abatement equipment on machinery will be in place, properly maintained, and in good working order. • Capital Power has committed to limit construction speed to 50km/hr in the Project Area. Capital Power is committed to and will enforce speed limits with all contractors. • Capital Power is aware of the construction noise requirements provided in Section 2.11 of AUC Rule 012 and is committed to complying with applicable requirements. It is Capital Power’s understanding that AUC Rule 012 does not expressly prohibit construction outside 7:00 AM but that any noise impact on dwellings as a result of these activities are to be mitigated as necessary. There are stages of construction, such as the pouring of concrete for turbine pads and the topping of turbines where it may be necessary to commence construction prior to 7 am due to favourable environmental conditions and to provide sufficient time in the workday to complete these tasks. Capital Power will also advise nearby residents who might be disturbed by these activities and will strive to minimize any disruption. Any complaints raised will be addressed immediately. • Capital Power will comply with Development Permit condition to observe quiet time between 11PM and 6AM unless previous Council approval has been granted (County of Paintearth 2023).
Post-Construction and Operations	
Operation Noise	<ul style="list-style-type: none"> • Wind turbine generators will operate in compliance with AUC Rule 012. • Noise abatement, emission, and pollution control equipment on machinery will be in place, properly maintained and in good working order.

6.6 Soil and Vegetation Management

Table 12: Soil and Vegetation Management

Activity	Mitigation								
Pre-construction									
Plans	<ul style="list-style-type: none"> The Soil and Vegetation Management Plan (SVMP) as per the C&R Directive (AEP 2018a) is attached (Appendix F) to provide guidance on soil handling (soil stripping, stockpiling, and replacement), reclamation (soil replacement and revegetation), and weed management to prevent and control the spread of invasive species and listed weeds. The goal of the SVMP is to provide site-specific recommendations to support a return to pre-construction land use and site conditions. Refer to Appendix B of the SVMP for detailed operational soils mapping. 								
Clubroot Planning	<ul style="list-style-type: none"> Cleaning measures have been developed in accordance with the <i>Canadian Energy Pipeline Association Clubroot Management: Risk-based Guidance Document</i> (Paragon 2017) as well as the <i>Alberta Clubroot Mitigation Plan</i> and discussions with the County of Paintearth. Prior to construction, clubroot testing will be done at various points to assist in determining level of risk. 								
Construction									
Weed and Clubroot Management	<ul style="list-style-type: none"> Levels of cleaning described below are consistent with the <i>Canadian Energy Pipeline Association Clubroot Management: Risk-based Guidance Document</i> (Paragon 2017). <table border="1"> <thead> <tr> <th>Level</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>Level 1: Mechanical Clean</td> <td>Removing loose soil and crop debris from equipment using hand scrapers, wire brushes and/or compressed air. Wheels, tires, and boots should be cleaned.</td> </tr> <tr> <td>Level 2: Wash and Fine Clean</td> <td>Level 1 clean plus use of a pressure washer or steam clean on areas where soil has accumulated</td> </tr> <tr> <td>Level 3 – Disinfect</td> <td>Level 1 and 2 clean plus disinfect by misting with a minimum 1% bleach solution or surface disinfectant or equivalent efficacy. Keep wet with the solution as long as is practical</td> </tr> </tbody> </table> <p>(source: Paragon 2017)</p> <p>All Phases of Pre-Construction and Construction (Weed and Clubroot Management)</p> <ul style="list-style-type: none"> All vehicles and construction equipment will be clean (i.e., free of soils and vegetative debris) and disinfected (and documented) prior to arrival on site and cleaned prior to leaving site. Vehicles and equipment will be regularly visually inspected during working hours and cleaning will occur within a designated area (off site). This is considered a Level 3 cleaning in accordance with the <i>Canadian Energy Pipeline Association Clubroot Management: Risk-based Guidance Document</i> (Paragon 2017). Documentation of compliance will be required. Choose low traffic grassy areas near the field exit to complete cleaning when possible. Remove soil and crop debris by knocking or scraping off soil lumps and sweeping loose soil and vegetation from all equipment, vehicles, or tools used during Project activities. A pressure washer should be used to remove soil and vegetation if the equipment was operated during wet conditions. Salvaged soil materials will not be moved between different sites. 	Level	Description	Level 1: Mechanical Clean	Removing loose soil and crop debris from equipment using hand scrapers, wire brushes and/or compressed air. Wheels, tires, and boots should be cleaned.	Level 2: Wash and Fine Clean	Level 1 clean plus use of a pressure washer or steam clean on areas where soil has accumulated	Level 3 – Disinfect	Level 1 and 2 clean plus disinfect by misting with a minimum 1% bleach solution or surface disinfectant or equivalent efficacy. Keep wet with the solution as long as is practical
Level	Description								
Level 1: Mechanical Clean	Removing loose soil and crop debris from equipment using hand scrapers, wire brushes and/or compressed air. Wheels, tires, and boots should be cleaned.								
Level 2: Wash and Fine Clean	Level 1 clean plus use of a pressure washer or steam clean on areas where soil has accumulated								
Level 3 – Disinfect	Level 1 and 2 clean plus disinfect by misting with a minimum 1% bleach solution or surface disinfectant or equivalent efficacy. Keep wet with the solution as long as is practical								

Table 12: Soil and Vegetation Management

Activity	Mitigation
Weed and Clubroot Management	<ul style="list-style-type: none"> • Areas that exhibit extensive weed infestations prior to disturbance will have soils salvaged and stockpiled separately to prevent the contamination of larger reclamation soil volumes. Documentation of compliance will be required. • Should a Project landowner request that Capital Power take additional steps to prevent the spread of clubroot or the County identifies where clubroot mitigation is required, Capital Power will work with them to ensure appropriate mitigation measures are taken. <p>Pre-construction Survey Work Clubroot Mitigations:</p> <ol style="list-style-type: none"> 1) For survey work, access will be done via truck or by foot. 2) Vehicles and or ATVs will be pressure washed each night before returning to site. 3) Onsite, vehicles will be mechanically cleaned and sanitized (Level 1 and Level 3) prior to entry to a new quarter. 4) Contractors will use disinfectant spray on boots or wear Tyvek boot covers prior to entry to a new quarter. 5) Tools will be mechanically cleaned and disinfected prior to entry to a new quarter. For entry into a field or different crop type with, vehicles will be mechanically cleaned. 6) All equipment will be inspected and documented prior to leaving each site to ensure that it has been cleaned appropriately. <p>Construction Specific Clubroot Mitigations:</p> <ol style="list-style-type: none"> 1) For construction traffic between quarter sections by vehicles or ATVs: <ol style="list-style-type: none"> a) <u>Dry Conditions</u>: Level 1 and Level 3 (disinfectant only - pressure washing will not be required) all equipment and disinfection of boots b) <u>Wet Conditions</u>: Level 2 and Level 3 (disinfectant) 2) For construction tracked equipment: Between quarter sections – Level 2 and Level 3 (disinfectant) all equipment and disinfection of boots. 3) For cable plough: Between quarter sections – Level 2 and Level 3 (disinfectant) for Tracked equipment, plough will remain in the ground. 4) Mats: Rig Mats and/or Cleaning Mats – Level 2 and Level 3 (disinfectant) 5) All equipment must be inspected and documented prior to leaving each site to ensure that it has been clean appropriately. 6) Following topsoil and upper subsoil stripping activities, equipment and vehicles are permitting to move between quarter sections without documentation of cleaning. <p>Documentation for Pre-Construction Survey Work and Construction Work Includes:</p> <ul style="list-style-type: none"> • Date/time/worksite • Equipment involved cleaning process applied (Level 1, 2 or 3) • Personnel involved and sign-off • Photographic record • EPC is required to maintain their records as will Capital Power employees and contractors

Table 12: Soil and Vegetation Management

Activity	Mitigation
Clearing	<ul style="list-style-type: none"> • Vegetation clearing will be limited to the Project Footprint and the smallest area practicable. Where possible, short shrub species will be “walked down” or simply driven over to preserve the growth crown and root network, thereby enhancing regeneration after construction is complete. Plan vegetation clearing in all non-cultivated habitats outside of the restricted activity period (April 1 – August 28). Restricted activity periods are further discussed on Section 6.8. • Per the C&R Directive, topsoil and upper subsoil (A and B horizons, respectively) must be conserved and replaced (AEP 2018a). The salvage approach will include stripping topsoil (A horizons) and upper subsoil (B horizons) as two separate lifts, with lower subsoil (C horizons) being excavated separately to the design grade depth. Upper subsoil from Soil Management Units (SMUs) with poor or unsuitable reclamation suitability and lower subsoil/grade material will not be salvaged and therefore will not stockpiled, however, if these types of soils are piled during grading they must be kept separate from stockpiled subsoil to eliminate the potential for admixing. Refer to Appendix F for specific soil handling recommendations. • Topsoil and upper subsoil should be stripped to the total depth described in the operational mapping. Upper subsoil salvage is required to a maximum of 30 cm, which may be shallower than natural soil horizons. Specific soil stripping methods and approximate soil salvage depths and volumes for individual soil types will be detailed in the SVMP. Specific stripping and stockpiling instructions for salt-affected soils are described in the SVMP (Appendix F). All stockpiles will be stabilized as necessary to prevent erosion. • Topsoil and subsoil from wetlands (ZGL SMU) will be salvaged in two distinct lifts and stockpiled in discrete topsoil and subsoil stockpiles prior to grading and construction. Wetland topsoil and subsoil stockpiles must be kept separate from non-wetland topsoil and subsoil stockpiles. • In cultivated lands where salt-affected soils have been identified, it is recommended that topsoil will be salvaged and windrowed prior to ploughing in collector lines during periods of frozen ground conditions (if applicable) to avoid mixing salt-affected upper subsoil into topsoil. This mitigation does not apply to native grassland land uses, where minimal disturbance is preferred.
Grading	<ul style="list-style-type: none"> • Grading will be restricted to what is required for the access and safe construction and operation practices. • Interim reclamation activities will take place throughout the construction of the Project. These activities will include, but not be limited to, grading disturbed areas, contouring disturbed slopes to a stable profile, re-establishing natural drainage patterns, and revegetation with an appropriate seed mix. • Following construction of the Project, the gravel, geotextile matting, and power supplies will be removed from temporary construction areas and the upper subsoil and topsoil will be replaced. • Vegetation removal, soil disturbance and grading will be limited to smallest area practicable while maintaining safe construction and operation practices, especially near water body setbacks and areas prone to erosion.

Table 12: Soil and Vegetation Management

Activity	Mitigation
Soil Handling (general)	<ul style="list-style-type: none"> • Earthwork-related construction or decommissioning activities will be either shut down during wet and/or weather or conducted after appropriate mitigation measures are applied. In the absence of effective mitigation procedures, construction will be suspended. • Soil handling will be postponed during wet conditions to prevent water erosion, soil compaction, and rutting. Heavy equipment activities and soil handling will be restricted on fine (i.e., clay, sandy clay) and moderately fine-textured (i.e., clay loam, sandy clay loam) soils during wet conditions. • Soil handling activities will not occur in very coarse textured soils (e.g., sand and loamy sand) and coarse textured soils (e.g., sandy loam) during windy conditions to prevent wind erosion, loss of material, and dusty conditions. • Efforts will be made to minimize the tracking of mud and debris onto roads during construction.
Soil Salvage and Replacement	<ul style="list-style-type: none"> • In areas where soil will be salvaged, the topsoil (A horizons) and upper subsoil (B horizons) will be stripped and stored separately to limit the potential for admixing. Parent material or lower subsoil (C horizons) will be excavated as needed for grading purposes and must be stored separately from both topsoil and subsoil. • No excess soils will be transported off-site or to other landowners' properties without the authorization and consent of both the source and receiving landowners. • Site preparation (e.g., vegetation removal, stripping and grading) will be limited to the area necessary (i.e., Project footprint) to excavate and construct the area of the construction access roads requiring cut and fill to maintain safe construction practices and areas that are ploughed for underground collection system. • Salvaged topsoil will be stored adjacent to temporary Project construction footprint for use during reclamation and clean-up and in such a way as to not interfere with Project activities. Topsoil will not be used as padding or fill material in a temporary or permanent capacity. • Excess backfill materials will be redistributed onsite, will be transported to other areas of the Project for use as fill (where required), or disposed of off-site and/or on-site in cooperation with, and only as directed and approved, by landowners.

Table 12: Soil and Vegetation Management

Activity	Mitigation
Soil Stockpiling	<ul style="list-style-type: none"> • Stockpiles will be in areas near the disturbance and that minimize handling requirements during site preparation. • Where possible, stockpiles will be placed in already disturbed and cleared areas to reduce the disturbance footprint. • Topsoil and subsoil stockpiles will be located at least 1 m away (3 m if stored longer than 6 months) from each other and will be recorded, mapped, and signed so it is clear what type of material is present in each stockpile. • Soils will be stockpiled on like materials. Upland topsoil can be stored on unstripped upland topsoil. Upland subsoil can be stored on unstripped upland subsoil. Salt-affected materials may only be stored on other salt-affected materials. If wetlands are disturbed, these soils should be stored in upland areas to reduce erosion potential and material loss. • Stockpiles will be designed, constructed, and protected to minimize soil erosion. Tackifiers or seeding the stockpiles may be used to stabilize soil stockpiles, if necessary. • Track packing will be used to create rough and irregular surfaces on stockpiles to reduce the potential for erosion and increase the area for seed capture, seed germination, and moisture retention. • Erosion control techniques will be applied to stockpiles depending on the intended duration of the stockpile. Short term (i.e., less than 6 months) stockpiles may have the addition of cover material (e.g., straw) or track packing. Long term stockpiles (i.e., over 6 months) will be seeded with a rapidly establishing vegetative species. • Stockpiles will be monitored for erosion and invasive plant establishment on an ongoing basis.
Erosion Control	<ul style="list-style-type: none"> • Permanent erosion control measures will be employed around Project components (e.g., substation, access roads) including re-vegetation or placement of large diameter rock on slopes and the installation of permanent berms, as appropriate. • Disturbed areas will be stabilized with seed mixes selected in consultation with regional and/or municipal guidelines and the landowner, as appropriate. Landowners may choose to seed areas that were previously cultivated (i.e., crop, hay, and/or tame pasture) after soils have been replaced with their preferred crop or seed mix. • Temporary erosion or sediment control measures such as silt fences will be placed along Project components where required, and around sensitive areas like wetlands or waterbodies. • Follow-up inspections of the workspaces and communication with landowners will occur so that potential erosion issues are addressed in a proactive manner. • Soil handling and soil conditions will be monitored throughout construction to assess whether topsoil is being subject to degradation that will eventually impact soil capability. • Erosion and sedimentation control measures will remain in place until the construction activities are completed and the disturbed area has been stabilized, and revegetated. The erosion and sedimentation control measures will be regularly inspected.
Weed Control	<ul style="list-style-type: none"> • Weeds and undesirable vegetation within the Project footprint will be controlled prior to all clearing and soil salvage activities to limit introducing seeds or vegetative structures into soil stockpiles in accordance with the SVMP that will be developed for the Project. • All vehicle traffic and equipment will be required to remain within the Project footprint. • Control techniques will reflect site conditions and the nature of infestation, and could include a combination of hand pulling, mowing and spot spraying with appropriate herbicides. • Capital Power will abide by the Alberta Weed Control Act (GOA 2017) and Weed Control Regulations (GOA 2016b) and eradicate any prohibited noxious weed species populations and control any noxious weed species populations on the Project site.

Table 12: Soil and Vegetation Management

Activity	Mitigation
Post-construction Reclamation and Operations	
Regulations	<ul style="list-style-type: none"> Interim Monitoring Site Assessments (IMSAs) will be conducted following the next full growing season on progressively reclaimed areas for a minimum of three growing seasons (AEP 2018a).
Soil Replacement and Reclamation	<ul style="list-style-type: none"> Soils from temporarily disturbed areas will be replaced, stabilized, and revegetated as soon as practicable following construction. Soil handling activities will take place under dry and low wind conditions to prevent wind and water erosion, rutting, admixing, and compaction. Disturbed areas will be graded and contoured using parent material or appropriate fill to align with natural slopes and drainage patterns and will approximate pre-construction terrain conditions. Soils will be decompacted as needed, and stockpiled soils will be replaced in the reverse order in which they were stripped (i.e., subsoil will be replaced, followed by topsoil). After subsoil replacement, it will be smoothed and levelled to prevent admixing of subsoil and topsoil. Following the construction phase, temporary access roads. workspaces immediately adjacent to wetlands will be re-vegetated as quickly as feasible to reduce the potential for siltation. Temporarily reclaimed areas that will remain operational following construction will be revegetated with a low maintenance seed mix to prevent soil erosion and weed establishment.
Operations	
Vegetation Maintenance	<ul style="list-style-type: none"> Vegetation maintenance during operations will be periodically conducted for safety reasons (tall grass can pose a fire hazard around equipment) and will be timed to occur outside of the sensitive migratory bird nesting period (April 14 to August 28; ECCC 2018) or will be preceded by a non-intrusive nest survey if this period cannot be avoided.
Monitoring	<ul style="list-style-type: none"> The Project footprint will be regularly monitored for weed infestations during operation, and plant species designated as prohibited noxious or noxious (GOA 2017) will be eliminated or controlled. Vehicles and equipment that enter the Project site will be clean (i.e., free of soils and vegetative debris) and in good working order (i.e., no oil or hydraulic fluid leaks). All spills or contaminant releases will be reported and remediated as required.

6.7 Wetlands

Table 13: Wetland Protection Measures

Activity	Mitigation
Regulations	<ul style="list-style-type: none"> • Avoidance of wetlands was a design goal. Wetlands will not be disturbed without appropriate regulatory approvals or authorizations. • Where avoidance of temporary or permanent disturbance to wetlands was not possible, permitting requirements will be followed under the Alberta <i>Water Act</i> (GOA 2021a) and Alberta <i>Wetland Policy</i> (GOA 2013). A Wetland Assessment and Impact Report (WAIR) or Wetland Assessment and Impact Form (WAIF) will accompany the <i>Water Act</i> application and submitted via DRAS for permanent and temporary wetland effects, respectively. The <i>Water Act</i> approval for permanently impacted wetlands is provided in Appendix G. The <i>Water Act</i> approvals and notifications for temporarily impacted wetlands and Horizontal Directional Drill locations are provided in Appendix H. A separate <i>Water Act</i> notification for temporary collector line crossings will be provided in Appendix I. Notification will be prepared in Q4 2023. • Wetlands intersected by the Project permanent and temporary footprint are outlined in Appendix C. • If there is a change to the Project layout that requires impacts to a wetland, watercourse or water body, the applicable <i>Water Act</i> approval or Code of Practice notification will be submitted to AEP. In this case, all applicable Best Management Practices and mitigations described under the Alberta <i>Wetland Policy</i> (GOA 2013; GOA 2022), <i>Water Act Codes of Practice</i> (ESRD 2013c; GOA 2019), Alberta Transportation <i>Fish Habitat Manual</i> (AT 2001) and <i>Measures to Protect Fish and Fish Habitat</i> outlined by Fisheries and Oceans Canada (DFO 2019) would be required.
Staking	<ul style="list-style-type: none"> • Field-verify mapped delineations of affected wetland to confirm wetland area, in accordance with <i>Water Act</i> (GOA 2021a) requirements and adjust final siting where possible. • Wetlands that directly intersect the Project footprint or within 5 m of the Project footprint will be clearly marked prior to start of construction where adjacent to construction activities. • Refer to Appendix C for detailed environmental alignment sheets which depict direct wetland interactions and wetland setbacks. • Direct impacts to wetlands, ephemeral waterbodies and drainages can not extend beyond the Project Footprint and as outlined in Appendix C. Wetland boundaries between the Project footprint and wetland will be marked before construction start, and silt fencing will be installed to prevent vehicle traffic from entering wetlands that extend outside of the footprint when work cannot be scheduled under dry or frozen conditions. Plan construction during dry ground conditions to the extent possible, and use rig matting, geotextiles, vegetated buffer zones, earthen berms as appropriate. Wetlands temporarily disturbed will naturally regenerate from seeds present in the soil and from adjacent areas. Plan construction outside of the amphibian active period or implement mitigations for amphibians when intersecting Class III, IV or V wetlands. Refer to Section 6.8 for specific details regarding silt fencing requirements for amphibians and waterbirds. • Wetlands, ephemeral waterbodies and drainages within 5 m of the Project Footprint will be marked prior to construction. Silt fencing will be installed between the wetland and the nearest edge of the Project Footprint if construction cannot be scheduled during dry or frozen conditions. The Environmental Monitor may require additional silt fencing as required based on site conditions. Alternatively, the Environmental Monitor may determine silt fencing is not needed based on the distance of the wettest edge to the Project Footprint.

Table 13: Wetland Protection Measures

Activity	Mitigation
Horizontal Directional Drilling Under Wetlands	<ul style="list-style-type: none"> • Wetland W0974b, which interacts with a collector line in NE-10-40-14-W4M, is planned for directional drill (Appendix C). The boundaries of the wetland will be staked prior to starting work. No direct disturbance of the wetland has been approved by AEPA. • An HDD frac out plan will be available from the EPC contractor. • Silt fencing will be installed between the wetland and the nearest edge of the Project Footprint if construction cannot be scheduled during dry or frozen conditions.
Erosion and Sediment Control	<ul style="list-style-type: none"> • Construction should occur during dry or frozen ground conditions to the extent possible. Rig matting, geotextiles, vegetated buffer zones, earthen berms and/or silt fencing will be used, as appropriate.
Equipment	<ul style="list-style-type: none"> • Heavy equipment, such as bulldozers, used to hold taglines required to raise the blades and nacelle during turbine construction will not enter wetlands unless prior approval or authorization is in place.
Seeding	<ul style="list-style-type: none"> • Wetlands will not be seeded and will be left to revegetate naturally.

6.8 Wildlife Management

Table 14: Wildlife Management

Activity	Mitigation
Pre-Construction	
Baseline Surveys	<ul style="list-style-type: none"> • To meet the commitments outlined in the Amended AEP-FWS Referral Report (Appendix I), pre-construction wildlife inventory surveys will be completed including: <ul style="list-style-type: none"> • Migratory bird surveys (spring and fall) • Sharp-tailed grouse surveys • Breeding bird surveys • Bat surveys (spring and fall) • Raptor nest occupancy surveys • If any additional sensitive environmental features (e.g., nests, leks, dens or rare plants) are observed during pre-construction surveys, follow-up with AEP-FWS and additional mitigations may be required.
Nest Searches	<ul style="list-style-type: none"> • Nest sweeps conducted by a qualified and experienced wildlife biologist will be required prior to Project construction activities with the potential to occur during the grassland bird breeding season (April 1 to July 1; AEP 2018b) and the migratory bird nesting for nesting Zone B4 (April 14 to August 28; ECCC 2018). • If construction is scheduled during the migratory nesting period, nest searches will be performed by an experienced wildlife biologist in suitable nesting habitat (all non-cultivated areas) within 100 m of the construction activity to identify breeding birds or their nests (AEP 2018b). If breeding activity is identified, a minimum setback buffer of 100 m will be applied to the suspected nest location until young fledge to minimize the risk of disturbing birds, nests, or eggs in accordance with the <i>Migratory Bird Convention Act</i> (GOC 1994) and the <i>Alberta Wildlife Act</i> (GOA 2020).
Raptor Nest/Sharp Tail Grouse Leks	<ul style="list-style-type: none"> • Following surveys conducted in 2023, one active raptor nest (Swainson’s hawk) with a 100 m setback was observed as intersecting the footprint west of Turbine 4 (Appendix C, Figure 8).
Pileated Woodpecker	<ul style="list-style-type: none"> • Should potential pileated woodpecker nesting trees (i.e., greater than 40 cm diameter breast height [dbh]) need to be removed at any time of year, a pre-clearing nest survey will be conducted by an experienced wildlife biologist (ECCC 2022). However, the new regulations require that an unoccupied nest of this species needs to be registered with the Abandoned Nest Registry and remain unoccupied for 3 years prior to removal of the tree.
Amphibian Surveys	<ul style="list-style-type: none"> • The Project is not within the sensitive amphibian range. • Wetlands with 100 m setbacks (i.e., Class III, IV and V) which interact with the Project footprint are outlined in Appendix C. Wetland setbacks that interact with the Project footprint will be clearly marked with stakes during construction (see Table 6.7). • Prior to construction activities infringing within the 100 m setback of all Class III-V wetlands, a non-intrusive field survey will be conducted by an experienced wildlife biologist to determine the presence of amphibians if work occurs during the frost-free period, generally April 15 to September 15. • Silt fencing will be installed and buried to a minimum of 10 to 15 cm to prevent amphibians moving into active construction areas when working within the 100 m setback of all Class III-VI wetlands (Appendix C) where amphibian habitat is present and when work occurs during the frost-free period, generally April 15 to September 15.

Table 14: Wildlife Management

Activity	Mitigation
Staking and Flagging	<ul style="list-style-type: none"> Environmentally sensitive features (e.g., nest, wetland) or their associated setbacks will be clearly marked prior to start of construction.
Notification	<ul style="list-style-type: none"> If a new wildlife feature (e.g., nest, lek) with an applicable setback that overlaps with the Project footprint is identified, the Contractor Environmental Lead will notify Capital Power who in turn will notify and consult with AEP-FWS to discuss mitigation options that will be applied to any nearby Project footprint components and appropriate for the specific circumstances to reduce effects to the new environmental feature.
Scheduling	<ul style="list-style-type: none"> Where setbacks from Class III+ wetland, native grassland, nests, or leks cannot be met Capital Power will schedule clearing and pre-construction activities outside of AEP's recommended restricted activity periods for sensitive wildlife. If clearing and construction is required during these periods, an experienced wildlife biologist will be onsite during construction, if necessary, to recommend mitigation to minimize disturbance to wildlife. In the event that a sensitive wildlife feature is suspected or identified and/or if adherence to the timing and/or setback restrictions is not possible, a site-specific mitigation and monitoring plan will be developed in consultation with AEP-FWS.
Training	<ul style="list-style-type: none"> A member of the onsite construction staff will be trained in protocols to respond to, and report environmental and wildlife issues identified onsite. This is typically the Contractor Environmental Lead or appropriate designate.
Monitoring	<ul style="list-style-type: none"> The EL shall employ the services of qualified wildlife monitors where required to guide implementation, monitor, and report on the effectiveness of any mitigation measures implemented during construction to minimize potential effects. These may include but are not limited to qualified wildlife biologists or soil specialists.

Table 14: Wildlife Management

Activity	Mitigation
Construction	
Scheduling	<ul style="list-style-type: none"> • Collector lines within the nest setbacks (Appendix C) will be installed using direct plough-in techniques using a single cut tooth that splits the earth apart and allows the cables and sand bedding along with warning tape to be installed and no backfilling or compaction is required. • Delivery of equipment or materials to turbines or other sites within the raptor nest setbacks should be avoided during the raptor breeding period (March 15 to July 15; GOA 2021c). • Construction or decommissioning within nest setbacks (Appendix C) will be scheduled outside of the raptor breeding period to minimize the probability of nest abandonment (March 15 to July 15; GOA 2021c). • Temporary disturbance will be reclaimed outside of the raptor breeding period (March 15 to July 15; GOA 2021c) to equivalent land use (e.g., cultivated, tame pasture or hay) following construction. • Schedule construction within 100 m setbacks or direct disturbances to Class III-VI wetlands (Appendix C) outside of the amphibian active period (i.e., breeding period [ESRD 2013a] and post-breeding period to first frost, approximately April 15 to September 15) or have an experienced wildlife biologist onsite, hired by the EPC, if construction during the amphibian breeding period is necessary within these areas. • When construction within a Class III, IV or V wetland with the potential to support amphibian populations cannot be scheduled outside of the amphibian active period (i.e., breeding period and post-breeding period to first frost, approximately April 15 to September 15), a pre-construction amphibian survey will be conducted. If the pre-construction amphibian survey confirms the presence of amphibians, an experienced wildlife biologist or qualified environmental monitor will conduct an amphibian salvage program. • When construction within the 100 m setback of Class III-VI wetlands with the potential to support amphibian populations cannot be scheduled outside the amphibian active period (April 15 to September 15 [ESRD 2013a]), a pre-construction amphibian survey will be conducted. If the pre-construction amphibian survey confirms the presence of amphibians, exclusion fencing will be installed and maintained along the nearest edge of the Project footprint. • Silt fencing will be installed and buried to a minimum of 10 to 15 cm to prevent amphibians moving into active construction areas when working within the 100 m setback of all Class III-VI wetlands (Appendix C) where amphibian habitat is present. • Nest sweeps conducted by an experienced wildlife biologist will be required prior to Project construction activities with the potential to occur during the grassland bird breeding season (April 1 to July 15; AEP 2018b) and the migratory bird nesting period for nesting Zone B4 (April 14 to August 28; ECCC 2018). • Construction activities will be avoided during non-daylight periods to the extent possible. • The potential for vehicle-wildlife collisions will be reduced by implementing reduced speed limits and signage on project access roads that intersect migrations paths or by avoiding access road construction during non-daylight periods, as many species of concern are nocturnal. • If active nests, as defined in AEP-FWS Policy, are identified during pre-construction surveys, Capital Power will schedule construction within the appropriate setback buffers outside of the breeding season or commit to having an onsite wildlife monitor if construction within the setback buffers is required during the breeding season for any reason. Capital Power will provide the wildlife monitor with written permission to issue a Stop Work Order in the event that adverse effects to the nest are observed (e.g., female flushing from nest, alarm calling, territorial behaviour). If required, a mitigation plan may also be developed in consultation with AEP-FWS to meet the intent of the Wildlife Directive for Alberta Wind Energy Projects (Wildlife Directive; AEP 2018b) to protect wildlife features. • During sensitive species timing periods, the number of Project personnel, vehicle or daily activities will be minimized to the extent practicable where a Project site is located within an environmentally sensitive feature setback.

Table 14: Wildlife Management

Activity	Mitigation
Clearing	<ul style="list-style-type: none"> • Vegetation clearing or application of a protective layer (e.g., matting, geo-textile) in native grassland will be scheduled outside the grassland bird breeding season (April 1 to July 15; AEP 2018b) and the migratory bird nesting period for nesting zone B4 (April 14 to August 28 ECCC 2018) to the extent practicable. If these activities are required during the bird breeding period, an experienced wildlife biologist will be onsite to conduct pre-disturbance surveys, or to monitor wildlife behaviour and to propose onsite mitigation measures that should be implemented to reduce risk to wildlife. • Clearing will be scheduled to avoid avian and amphibian breeding seasons to the extent possible. • Construction activities will maintain a minimum setback of 100 m from the edge of coulees, including the Paintearth Creek and Battle River.
Access Control/Fencing	<ul style="list-style-type: none"> • Measures to prevent wildlife inadvertently falling in and becoming trapped in open excavations or auger holes will be implemented. These may include fencing, benching, or other techniques. • Project personnel will avoid areas that are flagged or temporarily fenced and abide by restrictions on in/out privileges that are implemented in areas requiring special protection due to environmentally sensitive features. • The substation will be fenced to prevent unauthorized access. Fencing will have squared corners and will be embedded into the ground to stop wildlife from entering as is standard practice for other transmission facility operators in Alberta.
Monitoring	<ul style="list-style-type: none"> • An onsite wildlife monitor hired by the EPC will monitor construction activities when working in setbacks during the breeding seasons: <ul style="list-style-type: none"> • Raptor breeding period (March 15 to July 15 [AEP 2018b]) • Migratory bird nesting period (April 1 to July 15 [AEP 2018b] and April 14 to August 28 [Nesting Zone B4 ECCC 2018]); and • Amphibian breeding period (April 15 to June 14 [ESRD 2013a]): <ul style="list-style-type: none"> ○ It is recommended that practices for amphibian mitigation is expanded during the frost-free season from about April 15 to September 15. • The silt fencing will be inspected regularly and construction activities will be monitored should they occur during the amphibian breeding period. • Open excavations should be checked regularly for presence of wildlife (i.e., trapped). • Checks under and around the equipment and around stored materials will be conducted before entering and starting equipment or working in the area to reduce potential wildlife mortality. • Where avoidance of environmentally sensitive features such as a native grassland, coulee break/valley or their associated setbacks (i.e., within 100 m of a coulee/valley break) was not possible during Project design, a wildlife monitor will be present onsite, as required, to assess the features and to inspect or monitor construction activities at or near sensitive areas.
Reporting and Notifications	<ul style="list-style-type: none"> • Wildlife issues, incidents with wildlife, nuisance wildlife, and injured or dead wildlife will be reported, as soon as it is safe to do so, by Capital Power, who will determine appropriate corrective and/or emergency action to be taken in the field and regulatory reporting requirements. • If an injured or dead species is listed provincially (AEP 2017) and/or federally (GOC 2022) is observed on-site, Capital Power will promptly notify the local AEP-FWS Wildlife Biologist as per Standard 100.4.7 of the Wildlife Directive (AEP 2018b). • Notify the ECCC area biologist of any wildlife mortalities of federally listed species. • All records will be effectively maintained. This includes pertinent information from completed field surveys. Records of consultation will be included in the project folder, including advice or specific recommendations. Reports will include evidence to confirm that the appropriate provincial government authorities were consulted.

Table 14: Wildlife Management

Activity	Mitigation
Post-Construction and Operations	
Monitoring	
Monitoring	<ul style="list-style-type: none"> • Post-construction mortality monitoring for the Project will be carried out during the first three years of Project operation in accordance with the Post Construction Survey Protocols for Wind and Solar Energy Projects (AEP 2020) or the version that is in effect at the time the Project commences operations. • To meet the requirements of Standard 100.4.8 in the Wildlife Directive (AEP 2018b), an annual post-construction monitoring report will be submitted to AUC and AEP-FWS for review within 13 months of the Project becoming operational, and on or before the same date every subsequent year for which AEP requires surveys. • Post-construction survey data will be entered into a Fish and Wildlife Management Information System (FWMIS) loadform and will be submitted by December 1 of the year in which the permit was issued following the field season to the local AEP-FWS Wildlife Biologist to fulfil the field permit requirements. • Additional mitigation will be considered, if necessary, based on the results of the post-construction mortality surveys. • Carcasses of all species at risk and sensitive species will be submitted to AEP-FWS. • Injured wildlife will be included in mortality estimates. • Bat and bird mortality surveys will be conducted by a third-party environmental consultant or professional. • Post-construction monitoring must be conducted by an experienced wildlife biologist who has experience conducting surveys for the species in question.
Notification	<ul style="list-style-type: none"> • Post-construction monitoring reports will be submitted to AEP-FWS and the AUC annually by the end of January following the mortality monitoring period. • Reporting will follow Post Construction Survey Protocols for Wind and Solar Energy Projects requirements (AEP 2020b). • Mitigation measures will be assessed according to feasibility and suitability. Examples of mitigation strategies that could be employed, if required, include additional acoustic monitoring, alternative technologies, feathering, curtailment, or periodic shut downs. • Wildlife issues, incidents with wildlife, nuisance wildlife, and injured or dead wildlife will be reported, as soon as it is safe to do so, to Capital Power, who will determine in collaboration with the third party environmental consultant corrective and/or emergency action to be taken in the field and what regulatory reporting is required. • If an injured or dead species listed provincially and/or federally (GOC 2022) is observed onsite, Capital Power will promptly notify the local AEP-FWS Wildlife Biologist as per Standard 100.4.7 of the Wildlife Directive (AEP 2018b). • The local AEP-FWS biologist will be notified promptly after finding an injured or dead species listed provincially and/or federally on site.
Maintenance	<ul style="list-style-type: none"> • Operation and maintenance activities that occur outside the designated Project site (e.g., developed gravel pads or access roads) and within environmentally sensitive features or their associated setback will be scheduled outside the sensitive species timing period (Appendix A of the Wildlife Directive; AEP 2018b) to the extent practicable. If activities must be completed during the sensitive species timing periods, a pre-disturbance assessment for active nests, dens, burrows, or other sensitive wildlife habitat will be conducted experienced wildlife biologists. • During sensitive species timing periods, the number of Project personnel, vehicle or daily activities will be minimized to the extent practicable where Project site is located within an environmentally sensitive feature setback.

6.9 Unanticipated Cultural or Archaeological Discoveries

Table 15: Unanticipated Cultural or Archaeological Discoveries

Activity	Mitigation
Construction, Post-Construction, and Operations	
Reporting	<ul style="list-style-type: none"> • Comply with the standard requirements under the <i>Historical Resources Act</i> for reporting the discovery of historic resources (GOA 2021d; Appendix J). • The discovery of archaeological resources, palaeontological resources, historic structures or Aboriginal traditional use sites is to be reported to Alberta Culture and Status of Women (ACSW).

7 Post-Construction Compliance and Reporting Requirements

7.1 Post Construction Survey Protocols for Wind and Solar Energy Projects

In addition to adhering to commitments and mitigation applicable to the operations phase of the Project as outlined in Sections 6.0, Capital Power is committed to undertaking a post-construction monitoring plan, as outlined in the Wildlife Directive (AEP 2018b) and AUC Rule 033 (AUC 2019). The post-construction surveys will be completed as directed by the AEP *Post Construction Survey Protocols for Wind and Solar Energy Projects* (the Protocol; AEP 2020) or the version that is in effect at the time the Project commences operations. An annual post-construction monitoring report will be submitted to AEP-FWS by January 31 of the following year for a minimum of three years after the Project is operational and will include information outlined in the Protocol (AEP 2020).

7.2 Conservation and Reclamation Directive for Renewable Energy Operations

Interim Monitoring Site Assessments (IMSAs) will be conducted beginning the next full growing season following reclamation, on progressively reclaimed areas, for a minimum of three growing seasons in accordance with the C&R Directive (AEP 2018a). An updated C&R Plan must be submitted to AEP within five years of commissioning and will include the data and information collected as part of the Pre-Disturbance Site Assessment (PDSA) and IMSAs (AEP 2018). A revised C&R Plan must be submitted to AEP after any operational retrofits are made to the Project.

Following decommissioning and reclamation of the Project, Reclamation certificate site assessments (RCSA) will be completed prior to preparation of the Reclamation Certificate Application (AEP 2018a).

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APPENDIX A

AUC Permit & Licence

Power Plant Approval 27691-D02-2023

Appendix 1 to Decision 27691-D01-2023	July 27, 2023
Capital Power Generation Services Inc. Amend Halkirk 2 Wind Power Project	Proceeding 27691 Application 27691-A001

Capital Power Generation Services Inc., pursuant to Approval 25047-D02-2020,¹ has approval to construct and operate a power plant designated as the Halkirk 2 Wind Power Project, in the Halkirk area.

Capital Power, by Application 27691-A001, registered on October 5, 2022, applied to the Alberta Utilities Commission for approval to amend, construct and operate the power plant.

The Commission, pursuant to sections 11 and 19 of the *Hydro and Electric Energy Act*, approved the application in Decision 27691-D01-2023,² and granted an approval to Capital Power to amend, construct and operate the power plant, subject to the provisions of the *Hydro and Electric Energy Act* and the *Alberta Utilities Commission Act*, any regulations made under the acts, any orders made under the acts, the Commission rules made pursuant to the *Alberta Utilities Commission Act*, and the following terms and conditions:

1. The power plant shall be located in the following locations:

Sections	Township	Range	Meridian
25, 26, 34, 35	39	14	4
4, 6, 7, 8, 9, 10, 11	40	14	4
34, 35	39	15	4
1, 2, 3, 4, 9, 11, 12	40	15	4

2. The power plant shall consist of up to 33 wind turbines, with a maximum total generating capability of 151 megawatts, and as further described in the application.
3. Each wind turbine supporting structure shall be installed with its centre at the longitude and latitude coordinates specified in the application. If the support structure has to be located more than 100 metres from the specified coordinates, Capital Power must apply to the Commission for an amendment to this approval prior to construction.
4. The power plant shall also consist of a 34.5-kilovolt collector system as described in the application. The collector system is to be used solely for collecting the electric energy generated by each turbine and transmitting that electric energy to the Goldeye 620S Substation.

¹ Power Plant Approval 25047-D02-2020, Proceeding 25047, Application 25047-A001, March 5, 2020.

² Decision 27691-D01-2023: Capital Power Generation Services Inc. – Halkirk 2 Wind Power Project Amendment, Proceeding 27691, Applications 27691-A001 and 27691-A002, July 27, 2023.

5. The approval is subject to the following conditions which have been described in Decision 27691-D01-2023, Decision 25047-D01-2020,³ and Decision 22563-D01-2018:⁴
- a. Once Capital Power has finalized its equipment selection and turbine locations for the Halkirk 2 Wind Power Project, it must file a final project update to the Commission to confirm that the project has stayed within the final project update specified allowances for wind power plants. The final project update must be filed at least 90 days prior to the start of construction. Should Capital Power wish to proceed with turbines T10, T18, and T27, it must provide evidence demonstrating that any potential downwind turbulence caused by these turbines does not constitute a hazard for aircraft, or that the hazard posed by such downwind turbulence can be adequately mitigated. Evidence filed should consider both the characteristics of downwind turbulence (i.e., distance, direction, favourable and unfavourable conditions) and the effects of turbulence on the operation of aircraft.
 - b. Capital Power shall implement a turbine shut-off protocol to be followed when it receives a request at least 24 hours in advance of impacted aerial spraying operations. The protocol will include: (i) the direct phone number for the site supervisor and the remote operations control centre; (ii) a process to identify which localized turbines should be paused; (iii) a confirmation of dates, times and duration for planned aerial spraying activities; (iv) a process to ensure the site is safe and secure for spraying to occur; and (v) a process to ensure that Capital Power is notified when spraying is completed. Capital Power shall update the protocol as needed, and provide a copy of the protocol and any updates to all persons who expressed concerns about aerial spraying at any point during its consultation for this proceeding, and any landowners or tenants who express concerns about impacts to aerial spraying as a result of the project in the future.
 - c. Capital Power shall conduct a post-construction comprehensive sound level (CSL) survey, including an evaluation of low frequency noise, at receptors R015, R027, R036, R046, and R081. The post-construction CSL survey must be conducted under representative conditions and in accordance with Rule 012: *Noise Control*. Within one year after the project commences operations, Capital Power shall file a report with the Commission presenting measurements and summarizing the results of the post-construction CSL survey.
 - d. Capital Power shall, at the time it submits the final project update, confirm the number of hours of shadow flicker that receptors R007 and R034 are predicted to experience in a year.
 - e. Capital Power shall file a report with the Commission detailing any complaints or concerns it receives from local landowners regarding shadow flicker from the project during its first year of operation, as well as Capital Power's response to the complaints or concerns. If Capital Power implements mitigation to reduce shadow flicker impacts, the report shall detail the mitigation measures and associated landowners' feedback regarding

³ Decision 25047-D01-2020: Capital Power Generation Services Inc. – Halkirk 2 Wind Power Project Time Extension, Proceeding 25047, Applications 25047-A001 and 25047-A002, March 5, 2020.

⁴ Decision 22563-D01-2018: Capital Power Generation Services Inc. – Halkirk 2 Wind Power Project, Proceeding 22563, Applications 22563-A001 and 22563-A002, April 11, 2020.

the mitigation. Capital Power shall file this report no later than 13 months after the project becomes operational.

- f. Capital Power shall submit an annual post-construction monitoring survey report, to Alberta Environment and Protected Areas (AEPA) and the Commission no later than January 31 of the year following the mortality monitoring period, and on or before the same date every subsequent year for which AEPA requires surveys pursuant to subsection 3(3) of Rule 033: *Post-approval Monitoring Requirements for Wind and Solar Power Plants* and Section 4.0 of the Post-Construction Survey Protocols for Wind and Solar Energy Projects.
- g. Capital Power shall test groundwater quality and level at all residential and stock wells within 500 metres of a wind turbine location. Testing shall also occur at Barry Jackson's well, located approximately 79 feet from Township Road 400. Testing will be conducted prior to the construction of the wind turbine foundation to establish baseline conditions, and then conducted one year after cessation of ground disturbance. Groundwater quality testing will analyze parameters listed in the Level C Diagnostic Groundwater Suite as described in *Water Quality Testing: Drinking Water* issued by Alberta Agriculture and Forestry. In the event there are impacts to groundwater wells due to construction and/or operations related to the project, Capital Power will work with impacted landowners to implement appropriate mitigation on a case-by-case basis.
- h. Capital Power shall implement a clubroot mitigation protocol in accordance with Paintearth County's land use bylaws, which require appropriate cleaning between quarter sections. Capital Power shall retain an experienced third-party environmental monitor responsible for mitigation verification, record keeping, and the establishment of the appropriate frequency of monitoring (as needed) to ensure mitigations are being employed and followed at appropriate times. The third-party environmental monitor shall have the authority to halt construction if mitigation measures are not being implemented.
- i. At least 60 days prior to the commencement of construction, Capital Power shall file a letter with the Commission confirming (a) that the renewable energy referral report from AEPA is current and (b) that Capital Power will implement any additional mitigation measures recommended by AEPA.
- j. Capital Power shall complete amphibian surveys, following AEPA survey protocols, prior to construction where ground disturbance may occur within 100 metres of Class III to V wetlands. Capital Power will communicate the results to AEPA and implement any mitigation measures recommended by AEPA.
- k. Capital Power shall keep the project's wildlife data current until the project is commissioned by updating the pre-construction wildlife field surveys as required.
- l. Capital Power shall abide by any requirements and commitments outlined in the AEPA Renewable Energy Amendment Letter, Renewable Energy Project Amendment Submission and in the Post-Construction Monitoring and Mitigation Plan developed for the project. As necessary, Capital Power must continue to consult with AEPA throughout construction and operation of the project; for example, consultation should occur if habitat features of sensitive wildlife species are discovered during future surveys or

monitoring. Should Capital Power not implement any additional mitigation measures recommended by AEPA, Capital Power shall file a letter outlining the reasons why it believes such mitigation measures should not be required and the Commission will implement further process, if necessary.

- m. If any changes are made to the siting of the wind turbines, access roads, collector lines, and other infrastructure associated with the project, the construction schedule, or the proposed wildlife mitigation measures, Capital Power shall submit these changes to AEPA Wildlife Management for its further review and approval.
6. Capital Power shall notify the Commission within 30 days of completing the power plant.
7. Unless otherwise authorized by the Commission, the power plant shall be completed by April 30, 2025.
8. Capital Power shall obtain Commission approval prior to making any material changes to the power plant or substantially varying the design and/or specifications of the power plant from what was stated in the application or from what the Commission has approved.
9. This approval is not transferable unless approved by the Commission.

Approval 25047-D02-2020 is rescinded.

The Commission may cancel or suspend this approval, in whole or in part, in accordance with Section 41 of the *Hydro and Electric Energy Act* or may review this approval, in whole or in part, upon its own motion or upon an application by an interested party, in accordance with Section 10 of the *Alberta Utilities Commission Act*.

The Commission may, no later than 60 days from the date of this approval and without notice, correct typographical, spelling and calculation errors and other similar types of errors and post the corrected approval on its website.

Alberta Utilities Commission

(original signed by)

Vera Slawinski
Panel Chair

Substation Permit and Licence 27691-D03-2023

Appendix 2 to Decision 27691-D01-2023	July 27, 2023
Capital Power Generation Services Inc. Amend Goldeye 620S Substation	Proceeding 27691 Application 27691-A002

Capital Power Generation Services Inc., pursuant to Permit and Licence 25047-D03-2020,¹ has approval to construct and operate the Goldeye 620S Substation. By Application 27691-A002, registered on October 5, 2022, Capital Power applied to the Alberta Utilities Commission for approval to amend, construct and operate the substation.

The Commission, pursuant to sections 14, 15 and 19 of the *Hydro and Electric Energy Act*, approved the application in Decision 27691-D01-2023² and granted Capital Power a permit to amend and construct and a licence to operate the substation subject to the provisions of the *Hydro and Electric Energy Act* and the *Alberta Utilities Commission Act*, any regulations made under the acts, any orders made under the acts, the Commission rules made pursuant to the *Alberta Utilities Commission Act*, and the following terms and conditions:

1. The substation shall be wholly located in the southwest quarter of Section 12, Township 40, Range 15, west of the Fourth Meridian.
2. Specifications of the substation shall be:
 - (a) one 34.5/240-kilovolt (kV), 100/133/167-megavolt ampere (MVA) transformer
 - (b) one 240-kV circuit breaker
 - (c) six 34.5-kV circuit breakers
 - (d) it shall be enclosed within a secure fence and include other substation equipment as described in the application and other previous approvals pertaining to the substation
3. Capital Power shall file with the Commission, within 30 days of completing the substation, the energization certificate for the substation issued by Capital Power to confirm that the substation has been completed and the substation is being operated in accordance with the provisions of this permit and licence.
4. Unless otherwise authorized by the Commission, substation shall be completed by April 30, 2025.

Permit and Licence 25047-D03-2020 is rescinded.

¹ Substation Permit and Licence 25047-D03-2020, Proceeding 25047, Application 25047-A002, March 5, 2020.

² Decision 27691-D01-2023: Capital Power Generation Services Inc. – Halkirk 2 Wind Power Project Amendment, Proceeding 27691, Applications 27691-A001 and 27691-A002, July 27, 2023.

The Commission may cancel or suspend this permit and licence, in whole or in part, in accordance with Section 41 of the *Hydro and Electric Energy Act* or may review this permit and licence, in whole or in part, upon its own motion or upon an application by an interested party, in accordance with Section 10 of the *Alberta Utilities Commission Act*.

The Commission may, no later than 60 days from the date of this permit and licence and without notice, correct typographical, spelling and calculation errors and other similar types of errors and post the corrected permit and licence on its website.

Alberta Utilities Commission

(original signed by)

Vera Slawinski
Panel Chair

APPENDIX B

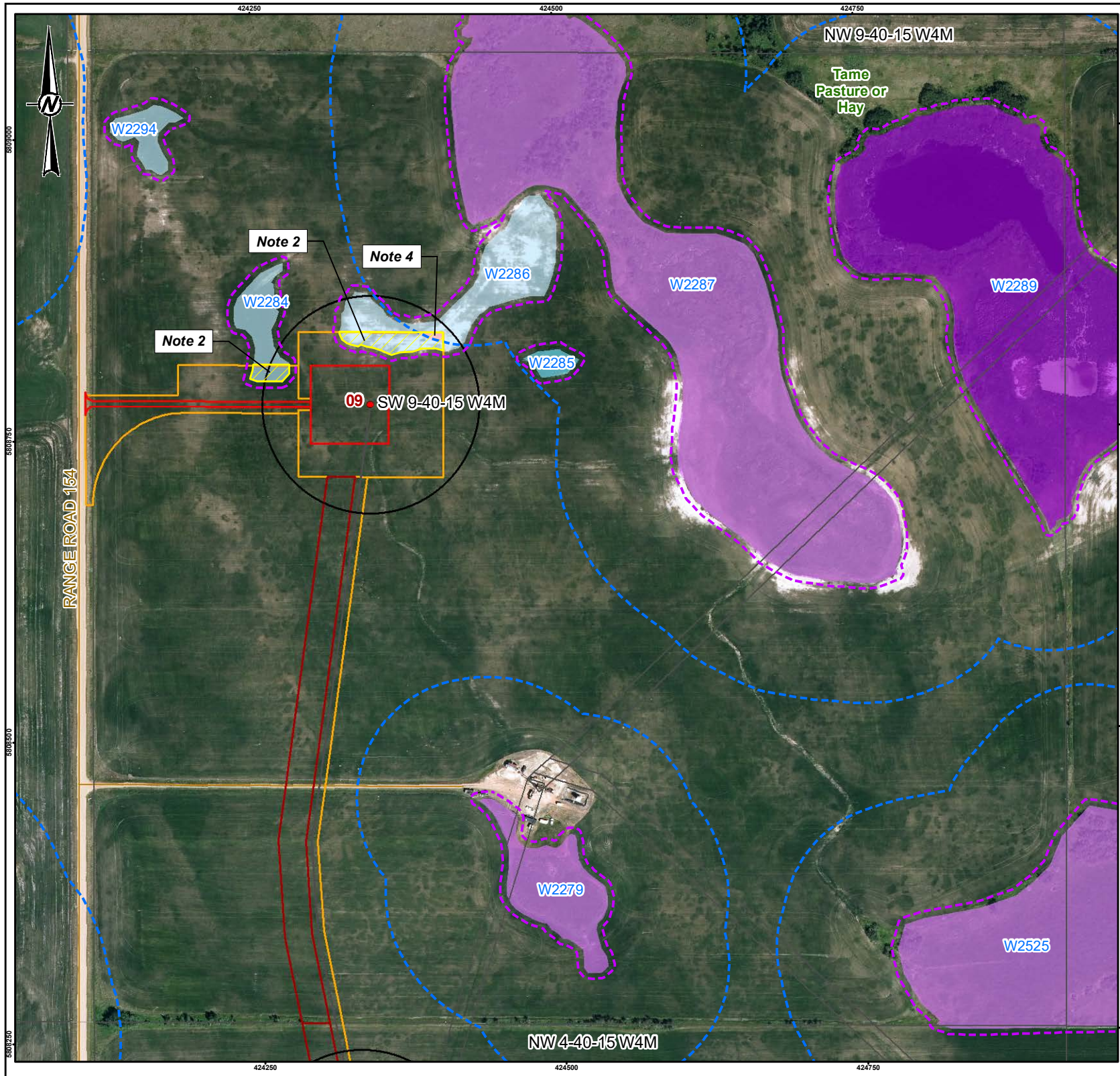
Project Specific Contact List

Contact	Phone Number
Capital Power Project Manager James Osness JOSNESS@capitalpower.com	1 (780) 868-4616
Capital Power Environmental Lead Jennifer Schroeder jbschroeder@capitalpower.com	1 (403) 462-4499
Capital Power Construction Manager Mark Angus mangus@capitalpower.com	1 (403) 966-8352
Capital Power Environmental Monitor Ryan White ryan.white@choice-ecg.com	1 (403) 680-9106
Broea Project Manager: Michael Cummer	1 (587) 583-4591
Borea Site Manager: TBD	
Borea Environmental Lead: Morgan Vercholuk	
Rising Edge Project Manager Aaron Andal	1 (403) 369-4095
Rising Edge Site Manager TBD	
Environmental Consultant: WSP Canada Inc. Sarah Clark, Project Manager sarah.clark@wsp.com	1 (587) 334-8873
County of Painteath No. 8 Office: #1 Crowfoot Crossing Twp Rd 374 & Hwy 12 Mailing Address: Box 509, Castor, AB T0C 0X0	1 (403) 882-3211

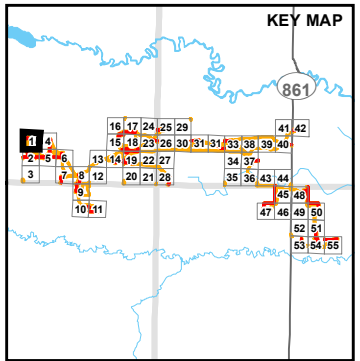
Contact	Phone Number
<p>Heritage Resource Specialist: Darryl Bereziuk Director, Archaeological Survey Alberta Culture and Status of Women Archaeological Survey Section Old St. Stephen's College 8820 - 112 Street Edmonton, Alberta T6G 2P8 darryl.bereziuk@gov.ab.ca</p>	<p>1 (780) 431-2316 (toll-free by first dialling 310-0000) (In case of discovery of archaeological resources)</p>
<p>Paleontological Specialist: Dan Spivak Head, Resource Management Royal Tyrrell Museum of Paleontology 1500 N Dinosaur Trail Drumheller, AB T0J 0Y0 dan.spivak@gov.ab.ca</p>	<p>1 (403) 820-6210 (toll-free by first dialling 310-0000) (In case of discovery of archaeological resources)</p>
<p>Historical Structures: Rebecca Goodenough, Manager Historic Places Research and Designation Program Old St. Stephen's College 8820 112 Street Edmonton, Alberta T6G 2P8 rebecca.goodenough@gov.ab.ca</p>	<p>1 (780) 431-2309 (toll-free by first dialling 310-0000) (In case of discovery of historical structures)</p>
<p>Aboriginal Traditional Land Use Sites: Valerie Knaga Director, Aboriginal Heritage Section Old St. Stephen's College 8820–112th Street NW Edmonton, Alberta T6G 2P8 valerie.k.knaga@gov.ab.ca</p>	<p>1 (780) 431-2371 (toll-free by first dialling 310-0000) (In case of discovery of traditional land use sites)</p>
<p>Area Wildlife Biologist, south region: Sandi Robertson Alberta Environment and Parks Provincial Building, 3rd Floor, 346 - 3 Street S. E. Medicine Hat, Alberta T1A 0G7 sandi.robertson@gov.ab.ca</p>	<p>1 (403) 528-5207</p>
<p>Environment and Climate Change Canada Canadian Wildlife Services Richard Wiacek Wildlife Biologist 9250 49 Street NW, 2nd Floor Edmonton, Alberta T6B 1K5 richard.wiacek@canada.ca</p>	<p>1 (780) 951-8702</p>

APPENDIX C

Environmental Alignment Sheets



- LEGEND**
- CADASTRAL
 - LOCAL ROAD
 - PROJECT LAYOUT**
 - TURBINE
 - ROTOR-SWEPT AREA
 - UNDERGROUND COLLECTOR SYSTEM
 - CRANE PATH
 - OPERATION FOOTPRINT
 - CONSTRUCTION FOOTPRINT
- ENVIRONMENTAL CONSTRAINTS**
- AREA OF FOOTPRINT INTERACTION/MITIGATION (SEE NOTES)
 - WETLAND (CLASS III+) SETBACK (100 m) INTERACTION
- WETLAND AND WATER BODY PERMANENCE**
- EPHEMERAL (CLASS I) WATER BODY
 - TEMPORARY (CLASS II) WETLAND
 - SEASONAL (CLASS III) WETLAND
 - SEMI-PERMANENT (CLASS IV) WETLAND
 - WETLAND (CLASS III+) SETBACK (100 m)
 - WETLAND SETBACK (5 m)



NOTE 1 - Raptor Nest Interactions:
NA

NOTE 2 - Direct Wetland or Ephemeral Waterbody Interactions (Class I, II, III, IV and V):
Direct impacts to wetlands can not extend beyond the Project Footprint and as outlined in this plan. Wetland boundaries between the Project footprint and wetland will be marked before construction start, and silt fencing will be installed to prevent vehicle traffic from entering wetlands that extend outside of the footprint when work cannot be scheduled under dry or frozen conditions. Plan construction during dry ground conditions to the extent possible, and use rig matting, geotextiles, vegetated buffer zones, earthen berms as appropriate. Wetlands temporarily disturbed will naturally regenerate from seeds present in the soil and from adjacent areas. Plan construction outside of the sensitive amphibian breeding period or implement mitigations for amphibians when intersecting Class III, IV or V (Refer to Note 4).

NOTE 3 - Wetlands within 5 m of the Footprint (Ephemeral waterbodies, drainages, Class II and higher):
NA

NOTE 4 - Within 100 m of a Class III, IV, or V (Amphibians and Waterbirds):
Schedule construction outside of the amphibian active period (i.e., breeding period and post-breeding period to first frost, approximately April 15 to September 15). When construction within 100 m wetlands setbacks with the potential to support amphibian populations cannot be scheduled outside the amphibian active period (April 15 to September 15), a pre-construction amphibian survey will be conducted. If the pre-construction amphibian survey confirms the presence of amphibians, exclusion fencing will be installed and maintained along the nearest edge of the Project Footprint. An experienced wildlife biologist or qualified environmental monitor will conduct an amphibian salvage program, if required. Nest searches will be performed within the 100 m setback by an experienced wildlife biologist, to identify breeding birds or their nests if construction is scheduled between April 1 and August 28. If breeding activity is identified, an appropriate setback buffer will be applied.

NOTE 5 - Direct Wetland Interactions - Class IV Collector Line Crossings:
NA

GENERAL NOTE - All non cultivated areas within 100 m of construction activities:
Schedule construction outside of recommended restricted activity periods (April 1 to August 28) within all non-cultivated habitats. If construction activities occur between April 1 and August 28, non-intrusive, pre-construction nest surveys will be performed an experienced wildlife biologist within 100 m of construction activity prior to construction. If breeding activity is identified, a minimum setback buffer of 100 m will be applied to the suspected nest location until young fledge to minimize the risk of disturbing birds, nests, or eggs. When there is potential for construction activities to pose an elevated risk to wildlife, an experienced wildlife biologist will be on site to monitor wildlife behaviour and to propose on site mitigation actions that should be implemented to reduce risk to wildlife.

GENERAL NOTE - Vegetation Clearing:
Vegetation clearing will be limited to the Project Footprint and the smallest area practicable. Where possible, short shrub species will be "walked down" or simply driven over to preserve the growth crown and root network, thereby enhancing regeneration after construction is complete. Plan vegetation clearing in all non-cultivated habitats outside of the restricted activity period (April 1 – August 28) to the extent possible (refer to General Note – all non-cultivated areas within 100 m of construction activities).

GENERAL NOTE - Clubroot and Weeds:
All vehicles and construction equipment will be clean (i.e., free of soils and vegetative debris) and disinfected (and documented) prior to arrival at the Project area and cleaned prior to leaving the Project area. All vehicles and equipment will be physically cleaned to remove soil and crop debris before traversing between fields as identified by the land agent or Environmental Monitor. Choose low traffic grassy areas near the field exit to complete cleaning when possible. Remove soil and crop debris by knocking or scraping off soil lumps and sweeping loose soil and vegetation from all equipment, vehicles, or tools used during project activities. Compressed air can be used to blow off any residue left on the machinery after scraping. A pressure washer should be used to remove soil and vegetation if the equipment was operated during wet conditions. Salvaged soil materials will not be moved between different sites. Areas that exhibit extensive weed infestations prior to disturbance will have soils salvaged and stockpiled separately to prevent the contamination of larger reclamation soil volumes.

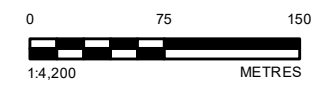
GENERAL NOTE - Turbine Foundation:
Mortality due to foundation construction activities, while not expected, may occur if wildlife falls into or becomes trapped within foundation excavations. To prevent wildlife from inadvertently falling in, open excavations or auger holes will be temporarily fenced off. Open excavations or auger holes left unsupervised will be checked daily to ensure no wildlife is trapped.

Category	Applicability	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
Raptor Nest Breeding Period	Raptor Nests and Setbacks			Wildlife Monitor Required when working in Setback									
				15-Mar				15-Jul					
Grassland Breeding Bird Nesting Period (April 1- July 15) and Migratory Bird Nesting Period, Nesting Zone B4 (April 14 - August 28)	All non cultivated areas within 100 m of construction activity.			Nest Sweep Required									
				1-Apr					28-Aug				
Amphibian Active Period (April 15 - September 15)	Direct impacts to Class III, IV and V wetlands, or work within 100 m setbacks of Class III, IV and V wetlands			Pre-Construction Amphibian Survey, Silt Fencing and Amphibian Monitoring Required as per Referral Report*		Pre-Construction Amphibian Survey, Silt Fencing and Amphibian Monitoring Recommended*							
				15-Apr	14-Jun					15-Sep			

*It is recommended that best practices for amphibian mitigation are applied during the frost-free season from about April to September 15.

REFERENCE(S)
1. ALBERTA DIGITAL BASE DATA MAY BE OBTAINED FROM GEOGRATIS, © DEPARTMENT OF NATURAL RESOURCES CANADA. ALL RIGHTS RESERVED. ALTALIS LTD. © GOVERNMENT OF ALBERTA 2023. ALL RIGHTS RESERVED., IHS MARKIT CANADA ULC.
2. 2018 ORTHOPHOTO OBTAINED FROM TARIN RESOURCE SERVICES LTD.

PROJECTION: UTM ZONE 12 DATUM: NAD 83



CLIENT **Capital Power**

PROJECT **HALKIRK 2 WIND POWER PROJECT**

TITLE **QUARTER SECTION: SW 9-40-15 W4M**

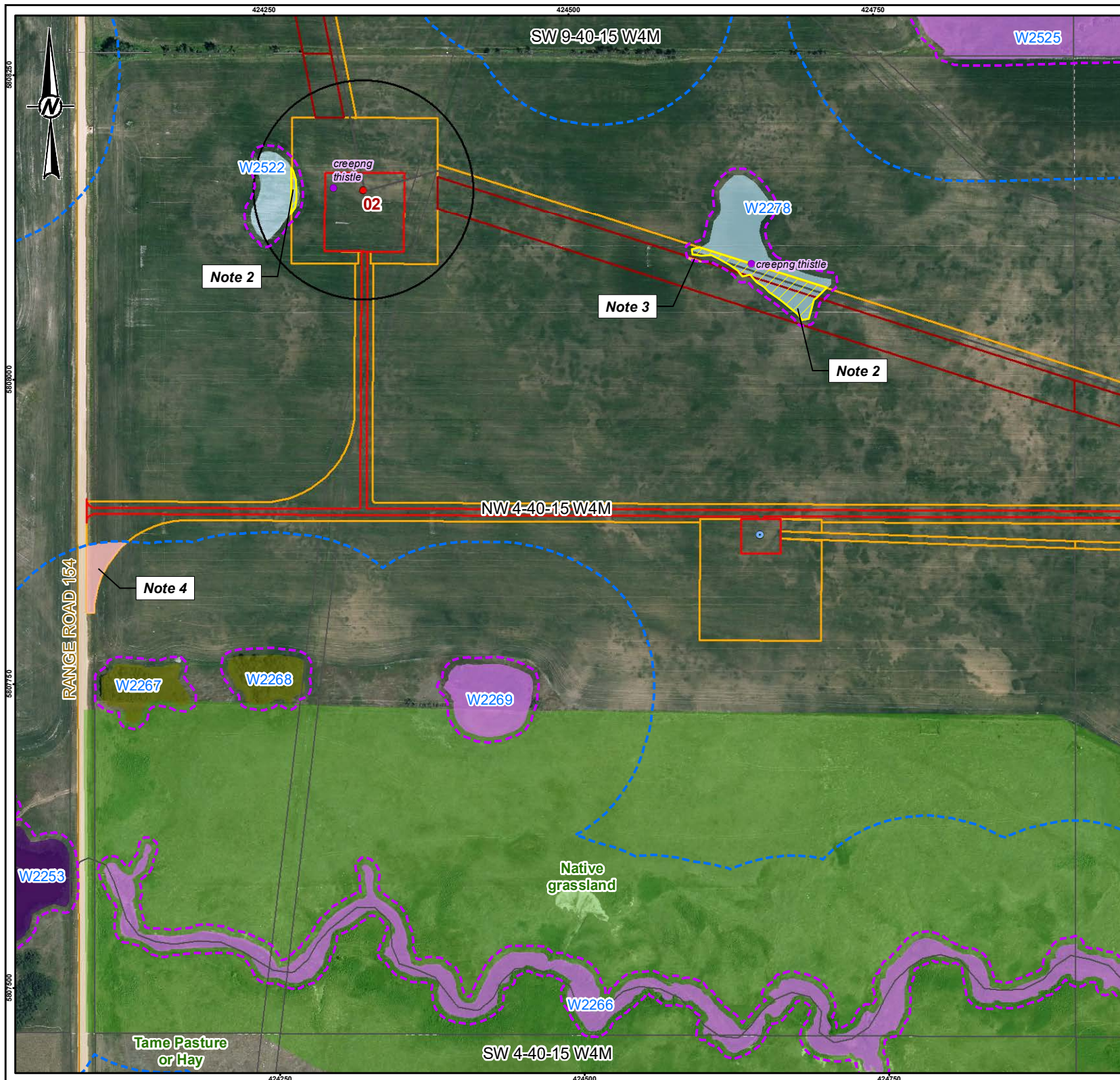
CONSULTANT **wsp**

DESIGNED	SC
PREPARED	LB
REVIEWED	SC
APPROVED	SC

PROJECT NO. 21452763 PHASE REV. 0 FIGURE 1

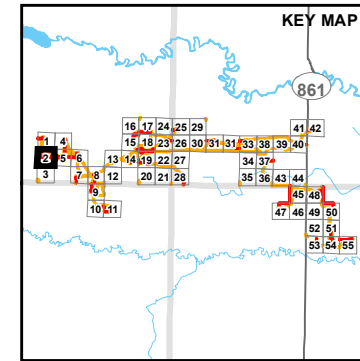
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IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B



LEGEND

- CADASTRAL
- LOCAL ROAD
- NATIVE GRASSLAND
- PROJECT LAYOUT**
 - TURBINE
 - METEOROLOGICAL TOWER
 - ROTOR-SWEPT AREA
 - UNDERGROUND COLLECTOR SYSTEM
 - CRANE PATH
 - OPERATION FOOTPRINT
 - CONSTRUCTION FOOTPRINT
- ENVIRONMENTAL CONSTRAINTS**
 - AREA OF FOOTPRINT INTERACTION/MITIGATION (SEE NOTES)
 - WETLAND SETBACK (5 m) INTERACTION (Silt fencing between the Project Footprint and wetland when work cannot be scheduled during dry or frozen periods.)
 - WETLAND (CLASS III+) SETBACK (100 m) INTERACTION
- WETLAND AND WATER BODY PERMANENCE**
 - EPHEMERAL (CLASS I) WATER BODY
 - SEASONAL (CLASS III) WETLAND
 - PERMANENT (CLASS V) WETLAND
 - WOODED DECIDUOUS SWAMP
 - WETLAND (CLASS III+) SETBACK (100 m)
 - WETLAND SETBACK (5 m)
- WEED OBSERVATION**
 - NOXIOUS WEED SPECIES OBSERVATION



NOTE 1 - Raptor Nest Interactions:
NA

NOTE 2 - Direct Wetland or Ephemeral Waterbody Interactions (Class I, II, III, IV and V):
Direct impacts to wetlands can not extend beyond the Project Footprint and as outlined in this plan. Wetland boundaries between the Project footprint and wetland will be marked before construction start, and silt fencing will be installed to prevent vehicle traffic from entering wetlands that extend outside of the footprint when work cannot be scheduled under dry or frozen conditions. Plan construction during dry ground conditions to the extent possible, and use rig matting, geotextiles, vegetated buffer zones, earthen berms as appropriate. Wetlands temporarily disturbed will naturally regenerate from seeds present in the soil and from adjacent areas. Plan construction outside of the sensitive amphibian breeding period or implement mitigations for amphibians when intersecting Class III, IV or V (Refer to Note 4).

NOTE 3 - Wetlands within 5 m of the Footprint (Ephemeral waterbodies, drainages, Class II and higher):
Wetlands, ephemeral water bodies and drainages within 5 m of the Project Footprint will be marked prior to construction. Silt fencing will be installed between the wetland and the nearest edge of the Project Footprint if construction cannot be scheduled during dry or frozen conditions. The Environmental Monitor may require additional silt fencing as required based on site conditions. Alternatively, the Environmental Monitor may determine silt fencing is not needed based on the distance of the wettest edge to the Project Footprint.

NOTE 4 - Within 100 m of a Class III, IV, or V (Amphibians and Waterbirds):
Schedule construction outside of the amphibian active period (i.e., breeding period and post-breeding period to first frost, approximately April 15 to September 15). When construction within 100 m wetlands setbacks with the potential to support amphibian populations cannot be scheduled outside the amphibian active period (April 15 to September 15), a pre-construction amphibian survey will be conducted. If the pre-construction amphibian survey confirms the presence of amphibians, exclusion fencing will be installed and maintained along the nearest edge of the Project Footprint. An experienced wildlife biologist or qualified environmental monitor will conduct an amphibian salvage program, if required. Nest searches will be performed within the 100 m setback by an experienced wildlife biologist, to identify breeding birds or their nests if construction is scheduled between April 1 and August 28. If breeding activity is identified, an appropriate setback buffer will be applied.

NOTE 5 - Direct Wetland Interactions - Class IV Collector Line Crossings:
NA

GENERAL NOTE - All non cultivated areas within 100 m of construction activities:
Schedule construction outside of recommended restricted activity periods (April 1 to August 28) within all non-cultivated habitats. If construction activities occur between April 1 and August 28, non-intrusive, pre-construction nest surveys will be performed an experienced wildlife biologist within 100 m of construction activity prior to construction. If breeding activity is identified, a minimum setback buffer of 100 m will be applied to the suspected nest location until young fledge to minimize the risk of disturbing birds, nests, or eggs. When there is potential for construction activities to pose an elevated risk to wildlife, an experienced wildlife biologist will be on site to monitor wildlife behaviour and to propose on site mitigation actions that should be implemented to reduce risk to wildlife.

GENERAL NOTE - Vegetation Clearing:
Vegetation clearing will be limited to the Project Footprint and the smallest area practicable. Where possible, short shrub species will be "walked down" or simply driven over to preserve the growth crown and root network, thereby enhancing regeneration after construction is complete. Plan vegetation clearing in all non-cultivated habitats outside of the restricted activity period (April 1 – August 28) to the extent possible (refer to General Note – all non-cultivated areas within 100 m of construction activities).

GENERAL NOTE - Clubroot and Weeds:
All vehicles and construction equipment will be clean (i.e., free of soils and vegetative debris) and disinfected (and documented) prior to arrival at the Project area and cleaned prior to leaving the Project area. All vehicles and equipment will be physically cleaned to remove soil and crop debris before traversing between fields as identified by the land agent or Environmental Monitor. Choose low traffic grassy areas near the field exit to complete cleaning when possible. Remove soil and crop debris by knocking or scraping off soil lumps and sweeping loose soil and vegetation from all equipment, vehicles, or tools used during project activities. Compressed air can be used to blow off any residue left on the machinery after scraping. A pressure washer should be used to remove soil and vegetation if the equipment was operated during wet conditions. Salvaged soil materials will not be moved between different sites. Areas that exhibit extensive weed infestations prior to disturbance will have soils salvaged and stockpiled separately to prevent the contamination of larger reclamation soil volumes.

GENERAL NOTE - Turbine Foundation:
Mortality due to foundation construction activities, while not expected, may occur if wildlife falls into or becomes trapped within foundation excavations. To prevent wildlife from inadvertently falling in, open excavations or auger holes will be temporarily fenced off. Open excavations or auger holes left unsupervised will be checked daily to ensure no wildlife is trapped.

Category	Applicability	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
Raptor Nest Breeding Period	Raptor Nests and Setbacks			Wildlife Monitor Required when working in Setback									
				15-Mar				15-Jul					
Grassland Breeding Bird Nesting Period (April 1- July 15) and Migratory Bird Nesting Period, Nesting Zone B4 (April 14 - August 28)	All non cultivated areas within 100 m of construction activity.			Nest Sweep Required									
					1-Apr				28-Aug				
Amphibian Active Period (April 15 - September 15)	Direct impacts to Class III, IV and V wetlands, or work within 100 m setbacks of Class III, IV and V wetlands				Pre-Construction Amphibian Survey, Silt Fencing and Amphibian Monitoring Required as per Referral Report*		Pre-Construction Amphibian Survey, Silt Fencing and Amphibian Monitoring Recommended*						
					15-Apr		14-Jun			15-Sep			

*It is recommended that best practices for amphibian mitigation are applied during the frost-free season from about April to September 15.

REFERENCE(S)
 1. ALBERTA DIGITAL BASE DATA MAY BE OBTAINED FROM GEOGRATIS, © DEPARTMENT OF NATURAL RESOURCES CANADA. ALL RIGHTS RESERVED. ALTALIS LTD. © GOVERNMENT OF ALBERTA 2023. ALL RIGHTS RESERVED., IHS MARKIT CANADA ULC.
 2. 2018 ORTHOPHOTO OBTAINED FROM TARIN RESOURCE SERVICES LTD.

PROJECTION: UTM ZONE 12 DATUM: NAD 83

CLIENT **Capital Power**

PROJECT **HALKIRK 2 WIND POWER PROJECT**

TITLE **QUARTER SECTION: NW 4-40-15 W4M**

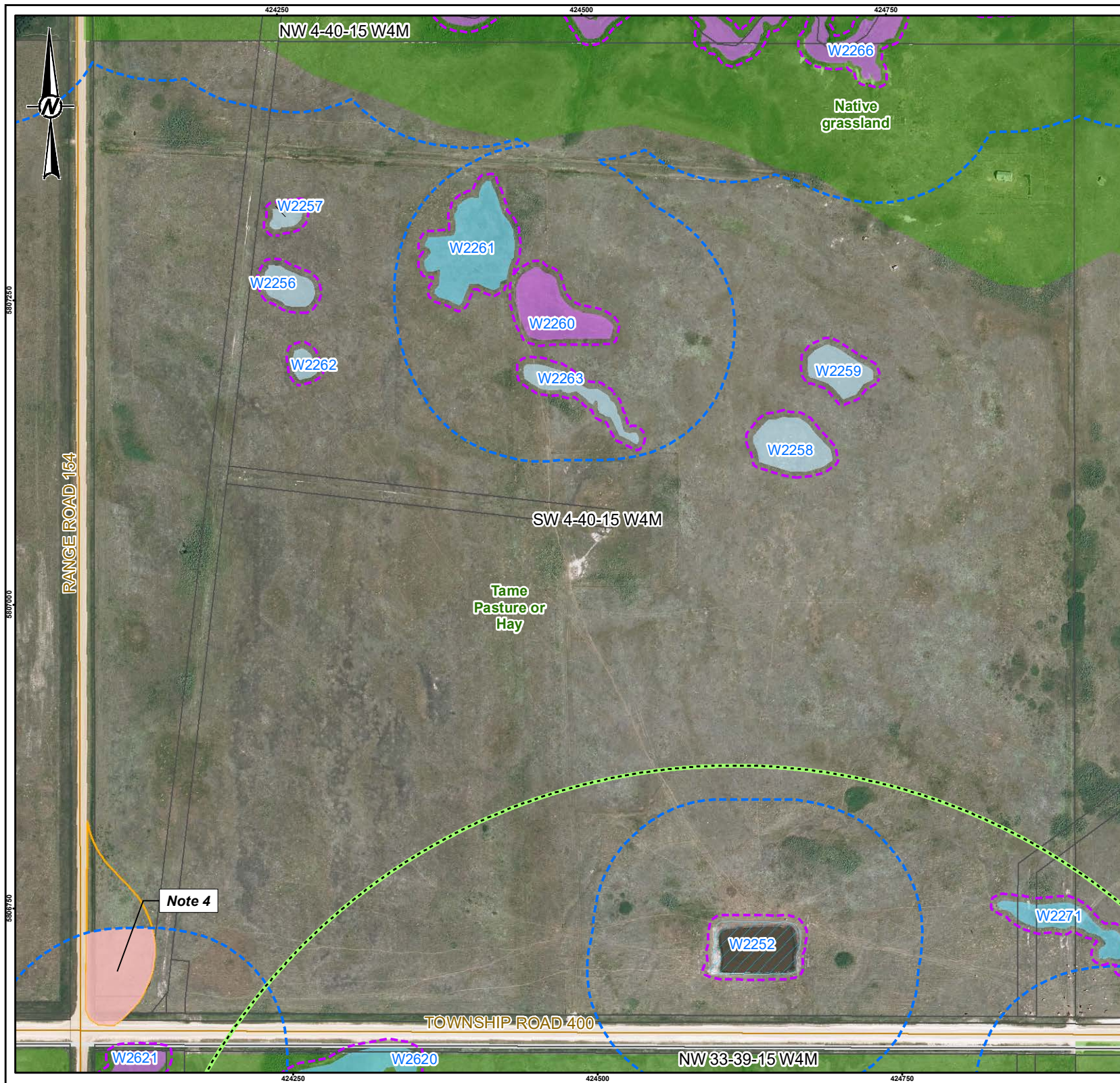
CONSULTANT

YYYY-MM-DD	2023-09-15
DESIGNED	SC
PREPARED	LB
REVIEWED	SC
APPROVED	SC

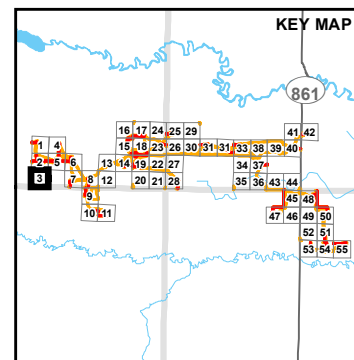
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IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B



LEGEND		ENVIRONMENTAL CONSTRAINTS		WETLAND AND WATER BODY PERMANENCE	
	CADASTRAL		AREA OF FOOTPRINT INTERACTION/MITIGATION (SEE NOTES)		EPHEMERAL (CLASS I) WATER BODY
	LOCAL ROAD		WETLAND (CLASS III+) SETBACK (100 m) INTERACTION		TEMPORARY (CLASS II) WETLAND
	NATIVE GRASSLAND		WILDLIFE HABITAT FEATURES		SEASONAL (CLASS III) WETLAND
	CONSTRUCTION FOOTPRINT		NEST SETBACK		ANTHROPOGENIC WATER BODY/MODIFIED NATURAL WETLAND
					WETLAND (CLASS III+) SETBACK (100 m)
					WETLAND SETBACK (5 m)



NOTE 1 - Raptor Nest Interactions:

NA

NOTE 2 - Direct Wetland or Ephemeral Waterbody Interactions (Class I, II, III, IV and V):

NA

NOTE 3 - Wetlands within 5 m of the Footprint (Ephemeral waterbodies, drainages, Class II and higher):

NA

NOTE 4 - Within 100 m of a Class III, IV, or V (Amphibians and Waterbirds):

Schedule construction outside of the amphibian active period (i.e., breeding period and post-breeding period to first frost, approximately April 15 to September 15). When construction within 100 m wetlands setbacks with the potential to support amphibian populations cannot be scheduled outside the amphibian active period (April 15 to September 15), a pre-construction amphibian survey will be conducted. If the pre-construction amphibian survey confirms the presence of amphibians, exclusion fencing will be installed and maintained along the nearest edge of the Project Footprint. An experienced wildlife biologist or qualified environmental monitor will conduct an amphibian salvage program, if required. Nest searches will be performed within the 100 m setback by an experienced wildlife biologist, to identify breeding birds or their nests if construction is scheduled between April 1 and August 28. If breeding activity is identified, an appropriate setback buffer will be applied.

NOTE 5 - Direct Wetland Interactions - Class IV Collector Line Crossings:

NA

GENERAL NOTE - All non cultivated areas within 100 m of construction activities:

Schedule construction outside of recommended restricted activity periods (April 1 to August 28) within all non-cultivated habitats. If construction activities occur between April 1 and August 28, non-intrusive, pre-construction nest surveys will be performed an experienced wildlife biologist within 100 m of construction activity prior to construction. If breeding activity is identified, a minimum setback buffer of 100 m will be applied to the suspected nest location until young fledge to minimize the risk of disturbing birds, nests, or eggs. When there is potential for construction activities to pose an elevated risk to wildlife, an experienced wildlife biologist will be on site to monitor wildlife behaviour and to propose on site mitigation actions that should be implemented to reduce risk to wildlife.

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Category	Applicability	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
Raptor Nest Breeding Period	Raptor Nests and Setbacks			Wildlife Monitor Required when working in Setback									
				15-Mar				15-Jul					
Grassland Breeding Bird Nesting Period (April 1- July 15) and Migratory Bird Nesting Period, Nesting Zone B4 (April 14 - August 28)	All non cultivated areas within 100 m of construction activity.			Nest Sweep Required									
					1-Apr				28-Aug				
Amphibian Active Period (April 15 - September 15)	Direct impacts to Class III, IV and V wetlands, or work within 100 m setbacks of Class III, IV and V wetlands				Pre-Construction Amphibian Survey, Silt Fencing and Amphibian Monitoring Required as per Referral Report*		Pre-Construction Amphibian Survey, Silt Fencing and Amphibian Monitoring Recommended*						
					15-Apr		14-Jun			15-Sep			

*It is recommended that best practices for amphibian mitigation are applied during the frost-free season from about April to September 15.

REFERENCE(S)

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- 2018 ORTHOPHOTO OBTAINED FROM TARIN RESOURCE SERVICES LTD.

PROJECTION: UTM ZONE 12 DATUM: NAD 83



CLIENT **Capital Power**

PROJECT **HALKIRK 2 WIND POWER PROJECT**

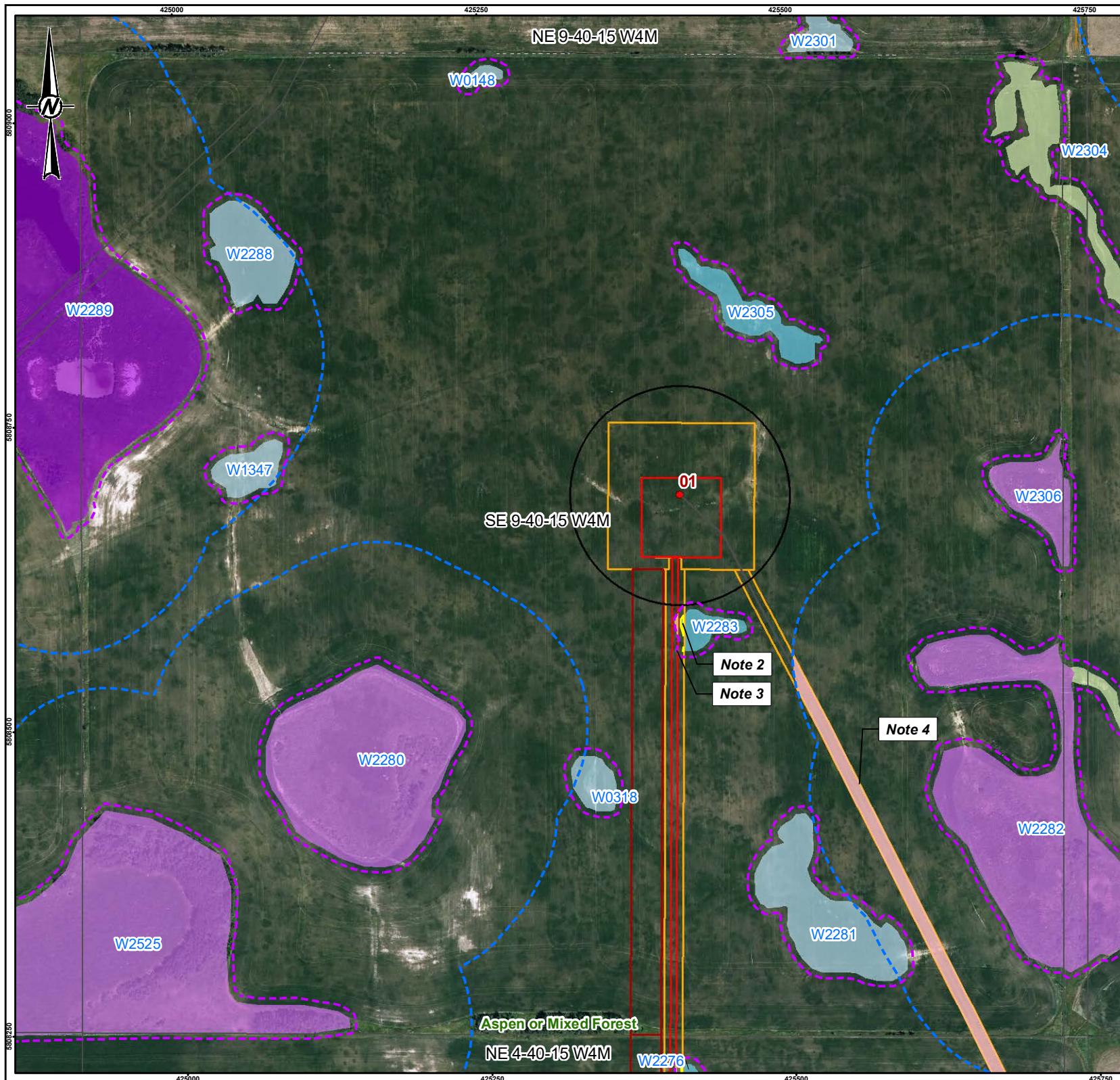
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CONSULTANT	YYYY-MM-DD	2023-09-15
DESIGNED	SC	
PREPARED	LB	
REVIEWED	SC	
APPROVED	SC	

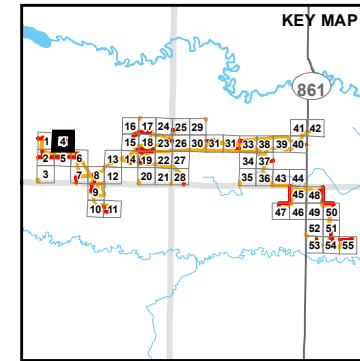
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IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B



- LEGEND**
- CADASTRAL
 - LOCAL ROAD
 - PROJECT LAYOUT**
 - TURBINE
 - ROTOR-SWEPT AREA
 - UNDERGROUND COLLECTOR SYSTEM
 - CRANE PATH
 - OPERATION FOOTPRINT
 - CONSTRUCTION FOOTPRINT
- ENVIRONMENTAL CONSTRAINTS**
- AREA OF FOOTPRINT INTERACTION/MITIGATION (SEE NOTES)
 - WETLAND SETBACK (5 m) INTERACTION (Silt fencing between the Project Footprint and wetland when work cannot be scheduled during dry or frozen periods.)
 - WETLAND (CLASS III+) SETBACK (100 m) INTERACTION
- WETLAND AND WATER BODY PERMANENCE**
- EPHEMERAL (CLASS I) WATER BODY
 - TEMPORARY (CLASS II) WETLAND
 - SEASONAL (CLASS III) WETLAND
 - SEMI-PERMANENT (CLASS IV) WETLAND
 - NATURAL DRAINAGE
 - WETLAND (CLASS III+) SETBACK (100 m)
 - WETLAND SETBACK (5 m)



NOTE 1 - Raptor Nest Interactions:
NA

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Direct impacts to wetlands can not extend beyond the Project Footprint and as outlined in this plan. Wetland boundaries between the Project footprint and wetland will be marked before construction start, and silt fencing will be installed to prevent vehicle traffic from entering wetlands that extend outside of the footprint when work cannot be scheduled under dry or frozen conditions. Plan construction during dry ground conditions to the extent possible, and use rig matting, geotextiles, vegetated buffer zones, earthen berms as appropriate. Wetlands temporarily disturbed will naturally regenerate from seeds present in the soil and from adjacent areas. Plan construction outside of the sensitive amphibian breeding period or implement mitigations for amphibians when intersecting Class III, IV or V (Refer to Note 4).

NOTE 3 - Wetlands within 5 m of the Footprint (Ephemeral waterbodies, drainages, Class II and higher):
Wetlands, ephemeral water bodies and drainages within 5 m of the Project Footprint will be marked prior to construction. Silt fencing will be installed between the wetland and the nearest edge of the Project Footprint if construction cannot be scheduled during dry or frozen conditions. The Environmental Monitor may require additional silt fencing as required based on site conditions. Alternatively, the Environmental Monitor may determine silt fencing is not needed based on the distance of the wettest edge to the Project Footprint.

NOTE 4 - Within 100 m of a Class III, IV, or V (Amphibians and Waterbirds):
Schedule construction outside of the amphibian active period (i.e., breeding period and post-breeding period to first frost, approximately April 15 to September 15). When construction within 100 m wetlands setbacks with the potential to support amphibian populations cannot be scheduled outside the amphibian active period (April 15 to September 15), a pre-construction amphibian survey will be conducted. If the pre-construction amphibian survey confirms the presence of amphibians, exclusion fencing will be installed and maintained along the nearest edge of the Project Footprint. An experienced wildlife biologist or qualified environmental monitor will conduct an amphibian salvage program, if required. Nest searches will be performed within the 100 m setback by an experienced wildlife biologist, to identify breeding birds or their nests if construction is scheduled between April 1 and August 28. If breeding activity is identified, an appropriate setback buffer will be applied.

NOTE 5 - Direct Wetland Interactions - Class IV Collector Line Crossings:
NA

GENERAL NOTE - All non cultivated areas within 100 m of construction activities:
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Category	Applicability	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
Raptor Nest Breeding Period	Raptor Nests and Setbacks			Wildlife Monitor Required when working in Setback									
				15-Mar				15-Jul					
Grassland Breeding Bird Nesting Period (April 1- July 15) and Migratory Bird Nesting Period, Nesting Zone B4 (April 14 - August 28)	All non cultivated areas within 100 m of construction activity.			Nest Sweep Required									
					1-Apr				28-Aug				
Amphibian Active Period (April 15 - September 15)	Direct impacts to Class III, IV and V wetlands, or work within 100 m setbacks of Class III, IV and V wetlands				Pre-Construction Amphibian Survey, Silt Fencing and Amphibian Monitoring Required as per Referral Report*		Pre-Construction Amphibian Survey, Silt Fencing and Amphibian Monitoring Recommended*						
					15-Apr	14-Jun				15-Sep			

*It is recommended that best practices for amphibian mitigation are applied during the frost-free season from about April to September 15.

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2. 2018 ORTHOPHOTO OBTAINED FROM TARIN RESOURCE SERVICES LTD.

PROJECTION: UTM ZONE 12 DATUM: NAD 83



CLIENT **Capital Power**

PROJECT **HALKIRK 2 WIND POWER PROJECT**

TITLE **QUARTER SECTION: SE 9-40-15 W4M**

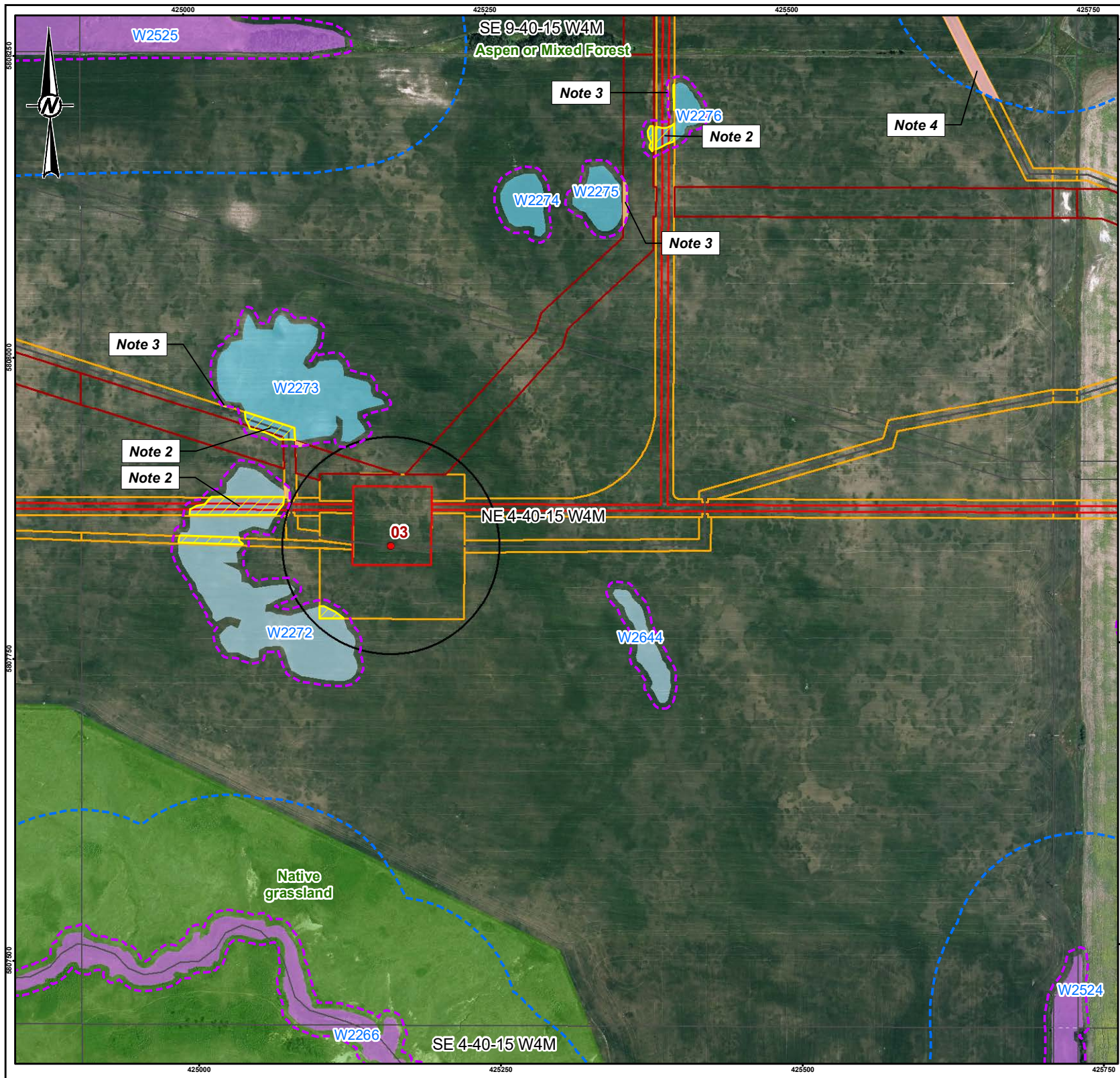
CONSULTANT

YYYY-MM-DD	2023-09-15
DESIGNED	SC
PREPARED	LB
REVIEWED	SC
APPROVED	SC

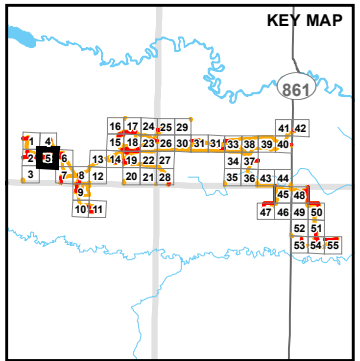
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IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B



- LEGEND**
- CADASTRAL
 - NATIVE GRASSLAND
 - PROJECT LAYOUT**
 - TURBINE
 - ROTOR-SWEPT AREA
 - UNDERGROUND COLLECTOR SYSTEM
 - CRANE PATH
 - OPERATION FOOTPRINT
 - CONSTRUCTION FOOTPRINT
 - ENVIRONMENTAL CONSTRAINTS**
 - AREA OF FOOTPRINT INTERACTION/MITIGATION (SEE NOTES)
 - WETLAND SETBACK (5 m) INTERACTION (Silt fencing between the Project Footprint and wetland when work cannot be scheduled during dry or frozen periods.)
 - WETLAND (CLASS III+) SETBACK (100 m) INTERACTION
 - WETLAND AND WATER BODY PERMANENCE**
 - EPHEMERAL (CLASS I) WATER BODY
 - TEMPORARY (CLASS II) WETLAND
 - SEASONAL (CLASS III) WETLAND
 - WETLAND (CLASS III+) SETBACK (100 m)
 - WETLAND SETBACK (5 m)



NOTE 1 - Raptor Nest Interactions:
NA

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Direct impacts to wetlands can not extend beyond the Project Footprint and as outlined in this plan. Wetland boundaries between the Project footprint and wetland will be marked before construction start, and silt fencing will be installed to prevent vehicle traffic from entering wetlands that extend outside of the footprint when work cannot be scheduled under dry or frozen conditions. Plan construction during dry ground conditions to the extent possible, and use rig matting, geotextiles, vegetated buffer zones, earthen berms as appropriate. Wetlands temporarily disturbed will naturally regenerate from seeds present in the soil and from adjacent areas. Plan construction outside of the sensitive amphibian breeding period or implement mitigations for amphibians when intersecting Class III, IV or V (Refer to Note 4).

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NOTE 5 - Direct Wetland Interactions - Class IV Collector Line Crossings:
NA

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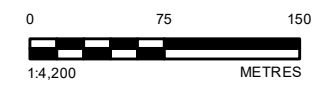
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					1-Apr				28-Aug				
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					15-Apr	14-Jun				15-Sep			

*It is recommended that best practices for amphibian mitigation are applied during the frost-free season from about April to September 15.

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2. 2018 ORTHOPHOTO OBTAINED FROM TARIN RESOURCE SERVICES LTD.

PROJECTION: UTM ZONE 12 DATUM: NAD 83



CLIENT **Capital Power**

PROJECT **HALKIRK 2 WIND POWER PROJECT**

TITLE **QUARTER SECTION: NE 4-40-15 W4M**

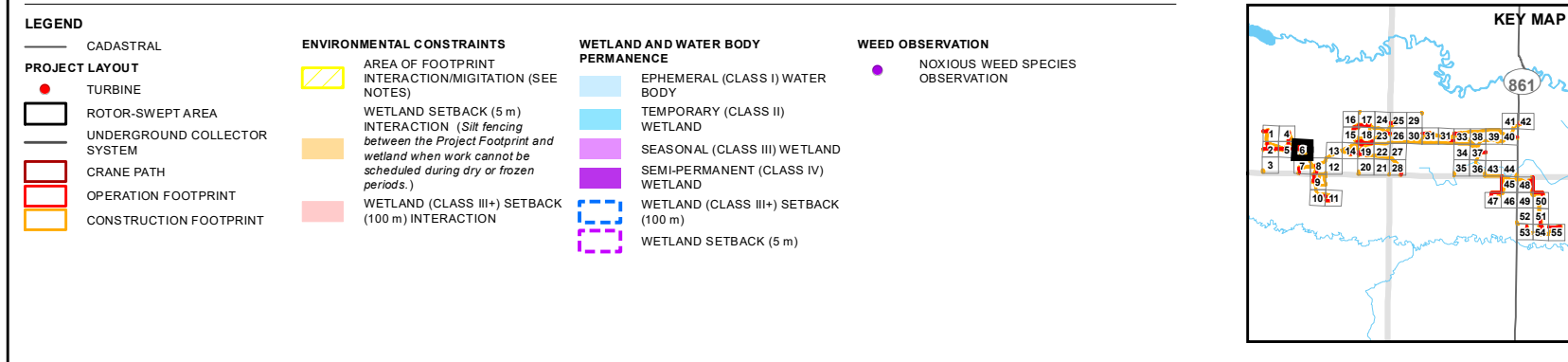
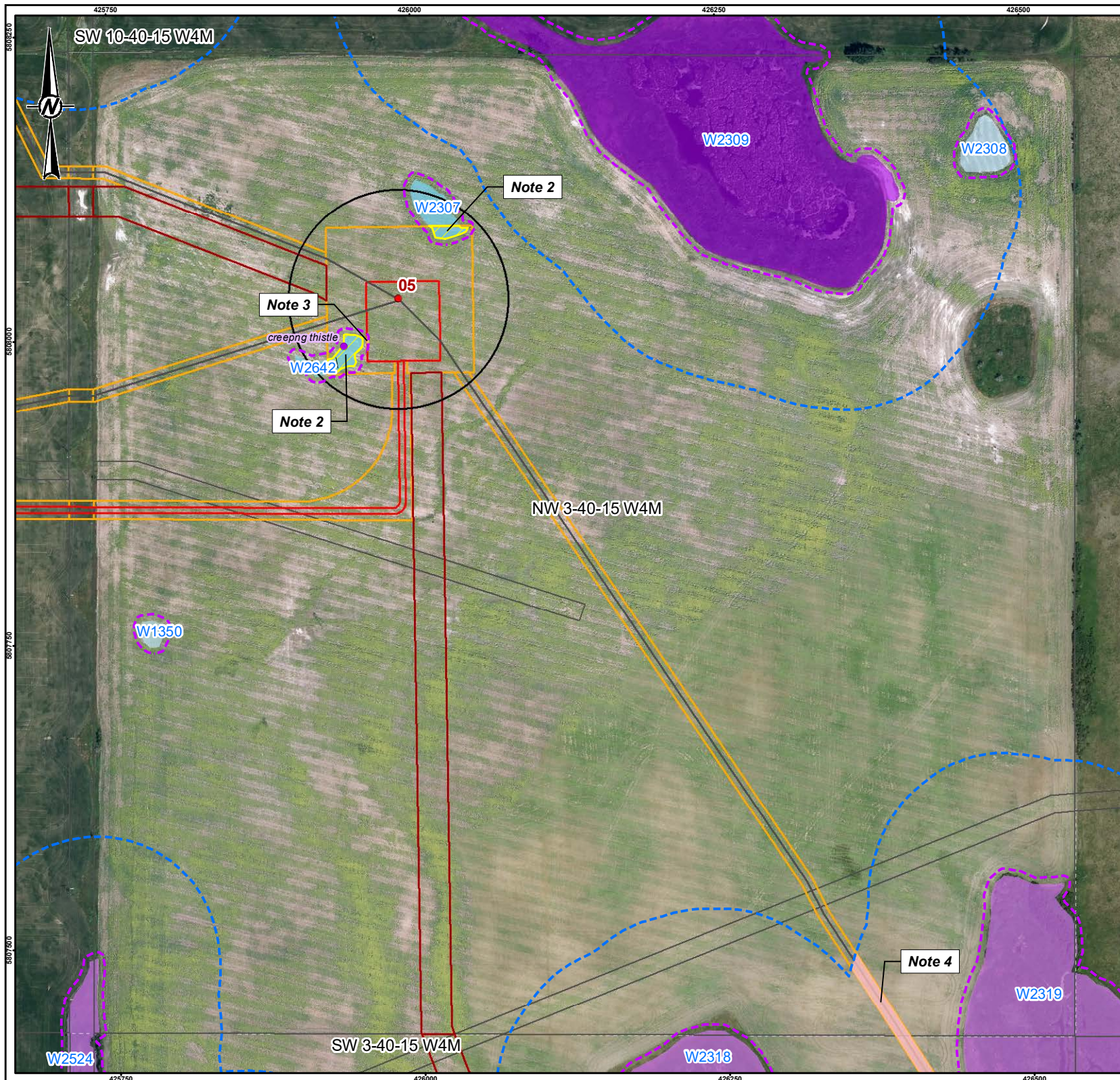
CONSULTANT

YYYY-MM-DD	2023-09-15
DESIGNED	SC
PREPARED	LB
REVIEWED	SC
APPROVED	SC

PROJECT NO. 21452763 PHASE REV. 0 FIGURE 5

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IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B



LEGEND		ENVIRONMENTAL CONSTRAINTS		WETLAND AND WATER BODY PERMANENCE		WEED OBSERVATION	
—	CADASTRAL		AREA OF FOOTPRINT INTERACTION/MITIGATION (SEE NOTES)		EPHEMERAL (CLASS I) WATER BODY		NOXIOUS WEED SPECIES OBSERVATION
●	TURBINE		WETLAND SETBACK (5 m) INTERACTION (Silt fencing between the Project Footprint and wetland when work cannot be scheduled during dry or frozen periods.)		TEMPORARY (CLASS II) WETLAND		
□	ROTOR-SWEPT AREA		WETLAND (CLASS III+) SETBACK (100 m) INTERACTION		SEASONAL (CLASS III) WETLAND		
—	UNDERGROUND COLLECTOR SYSTEM				SEMI-PERMANENT (CLASS IV) WETLAND		
—	CRANE PATH				WETLAND (CLASS III+) SETBACK (100 m)		
—	OPERATION FOOTPRINT				WETLAND SETBACK (5 m)		
—	CONSTRUCTION FOOTPRINT						

NOTE 1 - Raptor Nest Interactions:
NA

NOTE 2 - Direct Wetland or Ephemeral Waterbody Interactions (Class I, II, III, IV and V):
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NOTE 3 - Wetlands within 5 m of the Footprint (Ephemeral waterbodies, drainages, Class II and higher):
Wetlands, ephemeral water bodies and drainages within 5 m of the Project Footprint will be marked prior to construction. Silt fencing will be installed between the wetland and the nearest edge of the Project Footprint if construction cannot be scheduled during dry or frozen conditions. The Environmental Monitor may require additional silt fencing as required based on site conditions. Alternatively, the Environmental Monitor may determine silt fencing is not needed based on the distance of the wettest edge to the Project Footprint.

NOTE 4 - Within 100 m of a Class III, IV, or V (Amphibians and Waterbirds):
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NOTE 5 - Direct Wetland Interactions - Class IV Collector Line Crossings:
NA

GENERAL NOTE - All non cultivated areas within 100 m of construction activities:
Schedule construction outside of recommended restricted activity periods (April 1 to August 28) within all non-cultivated habitats. If construction activities occur between April 1 and August 28, non-intrusive, pre-construction nest surveys will be performed an experienced wildlife biologist within 100 m of construction activity prior to construction. If breeding activity is identified, a minimum setback buffer of 100 m will be applied to the suspected nest location until young fledge to minimize the risk of disturbing birds, nests, or eggs. When there is potential for construction activities to pose an elevated risk to wildlife, an experienced wildlife biologist will be on site to monitor wildlife behaviour and to propose on site mitigation actions that should be implemented to reduce risk to wildlife.

GENERAL NOTE - Vegetation Clearing:
Vegetation clearing will be limited to the Project Footprint and the smallest area practicable. Where possible, short shrub species will be "walked down" or simply driven over to preserve the growth crown and root network, thereby enhancing regeneration after construction is complete. Plan vegetation clearing in all non-cultivated habitats outside of the restricted activity period (April 1 – August 28) to the extent possible (refer to General Note – all non-cultivated areas within 100 m of construction activities).

GENERAL NOTE - Clubroot and Weeds:
All vehicles and construction equipment will be clean (i.e., free of soils and vegetative debris) and disinfected (and documented) prior to arrival at the Project area and cleaned prior to leaving the Project area. All vehicles and equipment will be physically cleaned to remove soil and crop debris before traversing between fields as identified by the land agent or Environmental Monitor. Choose low traffic grassy areas near the field exit to complete cleaning when possible. Remove soil and crop debris by knocking or scraping off soil lumps and sweeping loose soil and vegetation from all equipment, vehicles, or tools used during project activities. Compressed air can be used to blow off any residue left on the machinery after scraping. A pressure washer should be used to remove soil and vegetation if the equipment was operated during wet conditions. Salvaged soil materials will not be moved between different sites. Areas that exhibit extensive weed infestations prior to disturbance will have soils salvaged and stockpiled separately to prevent the contamination of larger reclamation soil volumes.

GENERAL NOTE - Turbine Foundation:
Mortality due to foundation construction activities, while not expected, may occur if wildlife falls into or becomes trapped within foundation excavations. To prevent wildlife from inadvertently falling in, open excavations or auger holes will be temporarily fenced off. Open excavations or auger holes left unsupervised will be checked daily to ensure no wildlife is trapped.

Category	Applicability	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
Raptor Nest Breeding Period	Raptor Nests and Setbacks			Wildlife Monitor Required when working in Setback									
				15-Mar				15-Jul					
Grassland Breeding Bird Nesting Period (April 1- July 15) and Migratory Bird Nesting Period, Nesting Zone B4 (April 14 - August 28)	All non cultivated areas within 100 m of construction activity.			Nest Sweep Required									
					1-Apr				28-Aug				
Amphibian Active Period (April 15 - September 15)	Direct impacts to Class III, IV and V wetlands, or work within 100 m setbacks of Class III, IV and V wetlands				Pre-Construction Amphibian Survey, Silt Fencing and Amphibian Monitoring Required as per Referral Report*		Pre-Construction Amphibian Survey, Silt Fencing and Amphibian Monitoring Recommended*						
					15-Apr		14-Jun			15-Sep			

*It is recommended that best practices for amphibian mitigation are applied during the frost-free season from about April to September 15.

REFERENCE(S)
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2. 2018 ORTHOPHOTO OBTAINED FROM TARIN RESOURCE SERVICES LTD.

PROJECTION: UTM ZONE 12 DATUM: NAD 83

CLIENT: **Capital Power**

PROJECT: **HALKIRK 2 WIND POWER PROJECT**

TITLE: **QUARTER SECTION: NW 3-40-15 W4M**

CONSULTANT: **wsp**

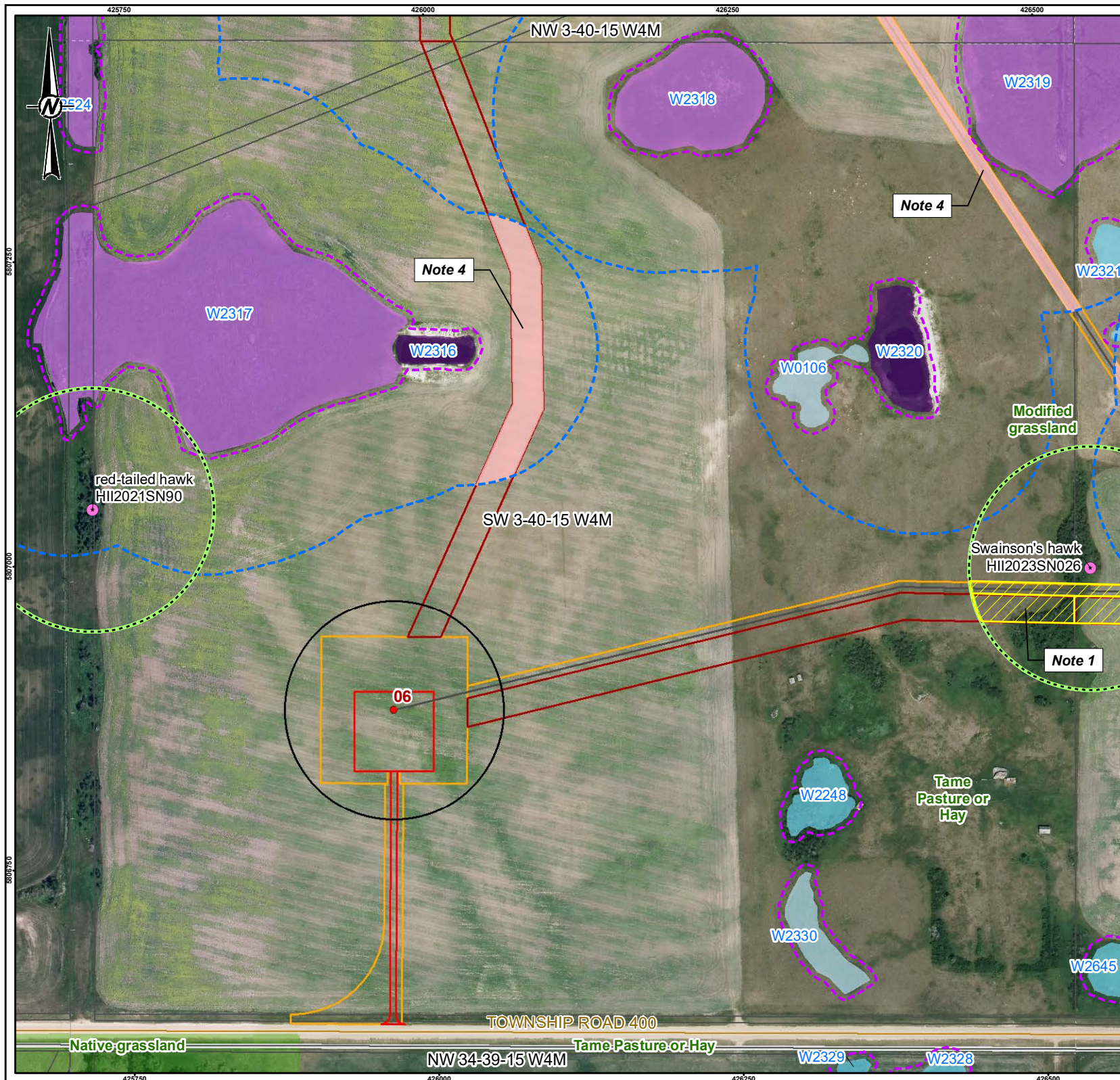
DESIGNED	REVIEWED	APPROVED
SC	LB	SC

PROJECT NO. 21452763 PHASE 0 REV. 0

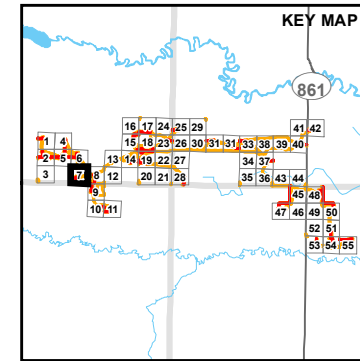
FIGURE 6

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IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B



- LEGEND**
- CADASTRAL**
 - LOCAL ROAD
 - NATIVE GRASSLAND
 - PROJECT LAYOUT**
 - TURBINE
 - ROTOR-SWEPT AREA
 - UNDERGROUND COLLECTOR SYSTEM
 - CRANE PATH
 - OPERATION FOOTPRINT
 - CONSTRUCTION FOOTPRINT
 - ENVIRONMENTAL CONSTRAINTS**
 - AREA OF FOOTPRINT INTERACTION/MITIGATION (SEE NOTES)
 - WETLAND (CLASS III+) SETBACK (100 m) INTERACTION
 - WILDLIFE HABITAT FEATURES**
 - NEST SETBACK
 - ACTIVE
 - RAPTOR NEST
 - WETLAND AND WATER BODY PERMANENCE**
 - EPHEMERAL (CLASS I) WATER BODY
 - TEMPORARY (CLASS II) WETLAND
 - SEASONAL (CLASS III) WETLAND
 - PERMANENT (CLASS V) WETLAND
 - WETLAND (CLASS III+) SETBACK (100 m)
 - WETLAND SETBACK (5 m)



NOTE 1 - Raptor Nest Interactions:
Collector lines within the nest setbacks will be installed using direct plough-in techniques. Construction or decommissioning within nest setbacks will be scheduled outside of the raptor breeding period to minimize the probability of nest abandonment (March 15 to July 15). Delivery of equipment or materials to turbines or other sites within the raptor nest setbacks should be avoided during the raptor breeding period (March 15 to July 15). Temporary disturbance will be reclaimed outside of the raptor breeding period (March 15 to July 15) to equivalent land use following construction.

NOTE 2 - Direct Wetland or Ephemeral Waterbody Interactions (Class I, II, III, IV and V):
NA

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NOTE 5 - Direct Wetland Interactions - Class IV Collector Line Crossings:
NA

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					1-Apr				28-Aug				
Amphibian Active Period (April 15 - September 15)	Direct impacts to Class III, IV and V wetlands, or work within 100 m setbacks of Class III, IV and V wetlands				Pre-Construction Amphibian Survey, Silt Fencing and Amphibian Monitoring Required as per Referral Report*			Pre-Construction Amphibian Survey, Silt Fencing and Amphibian Monitoring Recommended*					
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2. 2018 ORTHOPHOTO OBTAINED FROM TARIN RESOURCE SERVICES LTD.

PROJECTION: UTM ZONE 12 DATUM: NAD 83



CLIENT **Capital Power**

PROJECT **HALKIRK 2 WIND POWER PROJECT**

TITLE **QUARTER SECTION: SW 3-40-15 W4M**

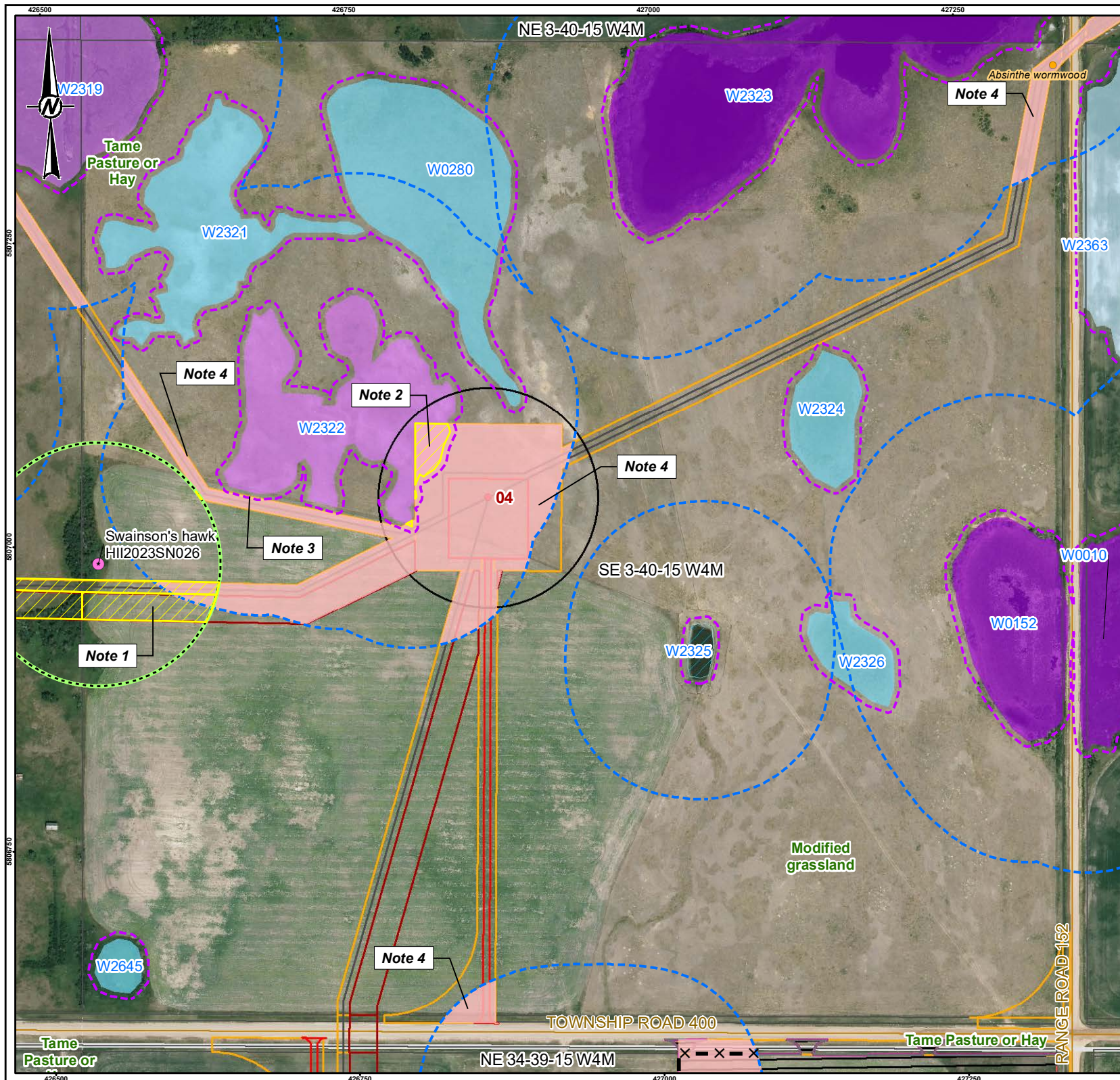
CONSULTANT **wsp**

YYYY-MM-DD	2023-09-15
DESIGNED	SC
PREPARED	LB
REVIEWED	SC
APPROVED	SC

PROJECT NO. 21452763 PHASE REV. 0 FIGURE 7

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IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B



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NOTE 5 - Direct Wetland Interactions - Class IV Collector Line Crossings:
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LEGEND

- CADESTAL
- LOCAL ROAD
- PROJECT LAYOUT
- TURBINE
- ROTOR-SWEPT AREA
- UNDERGROUND COLLECTOR SYSTEM
- CRANE PATH
- TEMPORARY LAYDOWN
- OPERATION FOOTPRINT
- CONSTRUCTION FOOTPRINT

ENVIRONMENTAL CONSTRAINTS

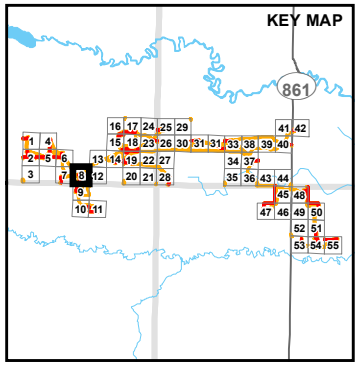
- AREA OF FOOTPRINT INTERACTION/MITIGATION (SEE NOTES)
- WETLAND SETBACK (5 m) INTERACTION (Silt fencing between the Project Footprint and wetland when work cannot be scheduled during dry or frozen periods.)
- WETLAND (CLASS III+) SETBACK (100 m) INTERACTION
- SILT FENCE REQUIRED
- WILDLIFE HABITAT FEATURES
- NEST SETBACK
- ACTIVE
- RAPTOR NEST

WETLAND AND WATER BODY PERMANENCE

- EPHEMERAL (CLASS I) WATER BODY
- TEMPORARY (CLASS II) WETLAND
- SEASONAL (CLASS III) WETLAND
- SEMI-PERMANENT (CLASS IV) WETLAND
- ANTHROPOGENIC WATER BODY/MODIFIED NATURAL WETLAND
- WETLAND (CLASS III+) SETBACK (100 m)
- WETLAND SETBACK (5 m)

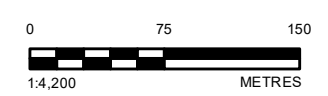
WEED OBSERVATION

- WEED OF CONCERN BY THE COUNTY OF PAINTEARTH



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2. 2018 ORTHOPHOTO OBTAINED FROM TARIN RESOURCE SERVICES LTD.

PROJECTION: UTM ZONE 12 DATUM: NAD 83



CLIENT **Capital Power**

PROJECT **HALKIRK 2 WIND POWER PROJECT**

TITLE **QUARTER SECTION: SE 3-40-15 W4M**

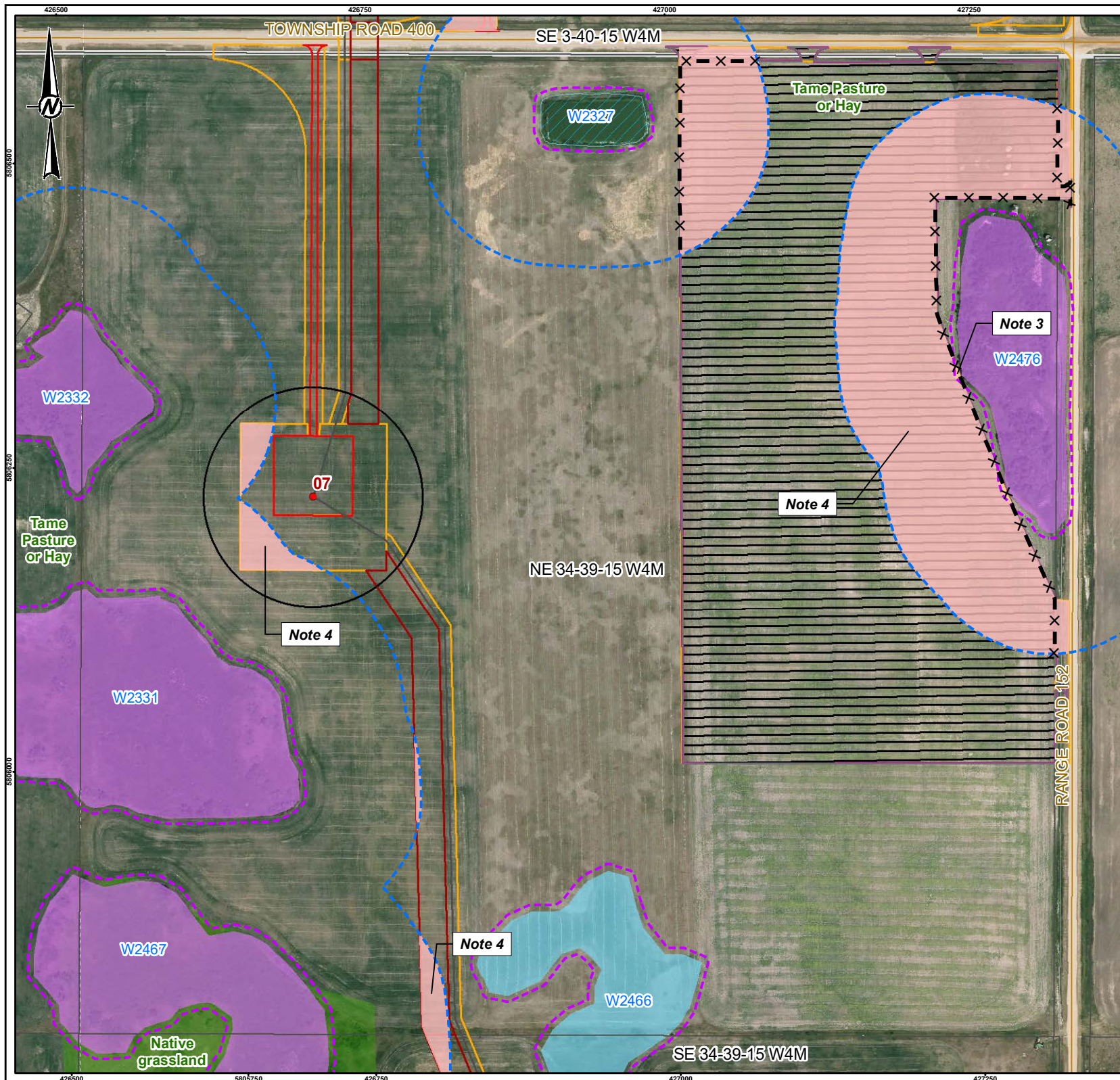
CONSULTANT

YYYY-MM-DD	2023-09-15
DESIGNED	SC
PREPARED	LB
REVIEWED	SC
APPROVED	SC

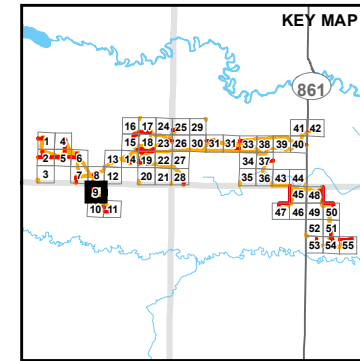
PROJECT NO. 21452763 PHASE REV. 0 FIGURE 8

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IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B



- LEGEND**
- CADASTRAL
 - LOCAL ROAD
 - NATIVE GRASSLAND
 - PROJECT LAYOUT**
 - TURBINE
 - ROTOR-SWEPT AREA
 - UNDERGROUND COLLECTOR SYSTEM
 - CRANE PATH
 - TEMPORARY LAYDOWN
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- TEMPORARY (CLASS II) WETLAND
 - SEASONAL (CLASS III) WETLAND
 - ANTHROPOGENIC WATER BODY/MODIFIED NATURAL WETLAND
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NA

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REFERENCE(S)

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- 2018 ORTHOPHOTO OBTAINED FROM TARIN RESOURCE SERVICES LTD.

PROJECTION: UTM ZONE 12 DATUM: NAD 83

CLIENT **Capital Power**

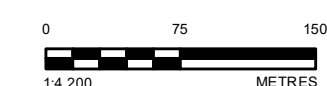
PROJECT **HALKIRK 2 WIND POWER PROJECT**

TITLE **QUARTER SECTION: NE 34-39-15 W4M**

CONSULTANT **wsp**

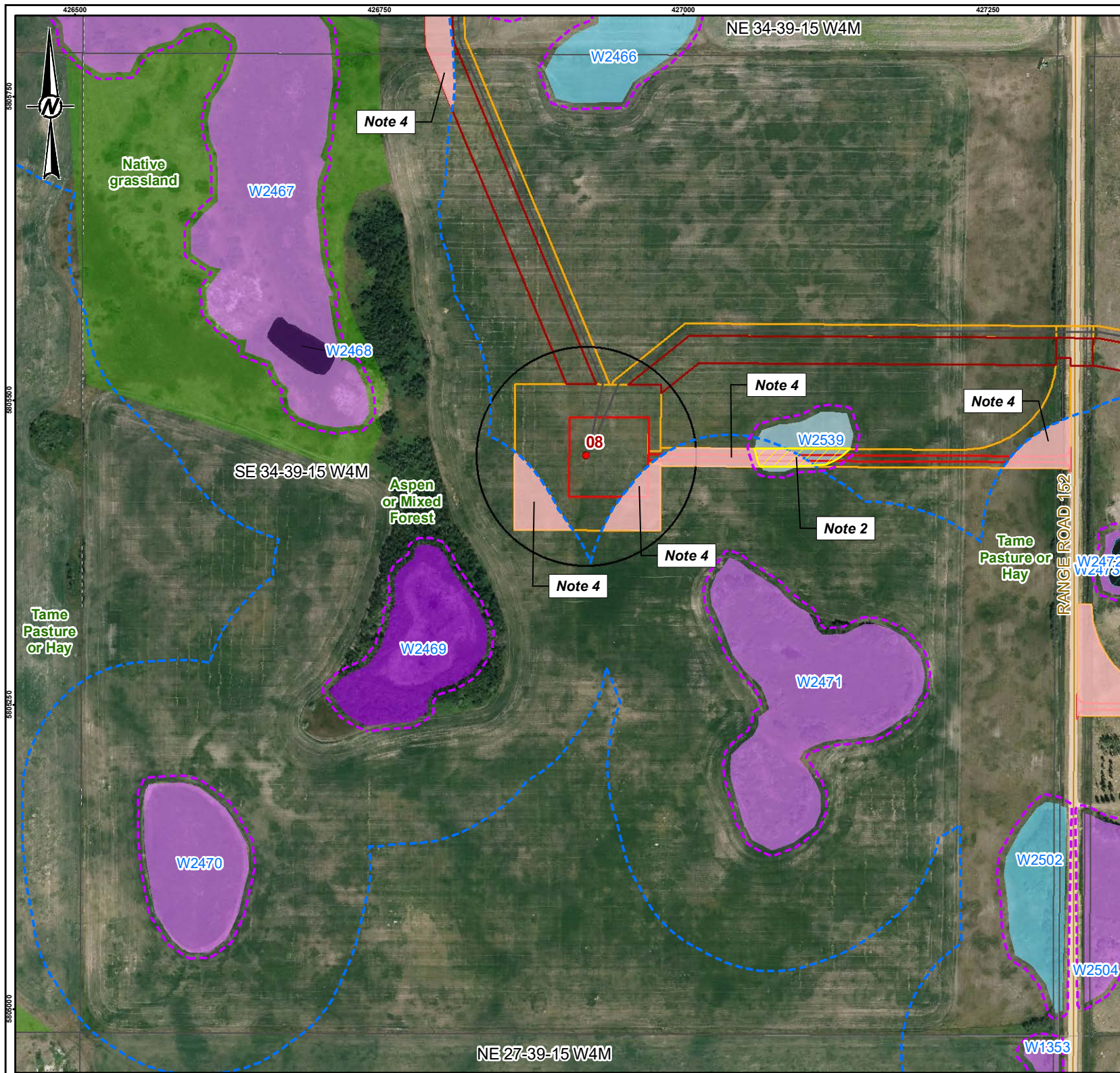
YYYY-MM-DD	2023-09-15
DESIGNED	SC
PREPARED	LB
REVIEWED	SC
APPROVED	SC

PROJECT NO. 21452763 PHASE APPROVED REV. 0 FIGURE 9

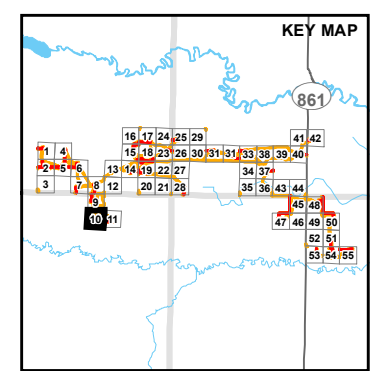


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IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B



- LEGEND**
- CADASTRAL
 - LOCAL ROAD
 - NATIVE GRASSLAND
 - TURBINE
 - ROTOR-SWEPT AREA
 - UNDERGROUND COLLECTOR SYSTEM
 - CRANE PATH
 - OPERATION FOOTPRINT
 - CONSTRUCTION FOOTPRINT
- ENVIRONMENTAL CONSTRAINTS**
- AREA OF FOOTPRINT INTERACTION/MITIGATION (SEE NOTES)
 - WETLAND (CLASS III+) SETBACK (100 m) INTERACTION
- WETLAND AND WATER BODY PERMANENCE**
- EPHEMERAL (CLASS I) WATER BODY
 - TEMPORARY (CLASS II) WETLAND
 - SEASONAL (CLASS III) WETLAND
 - SEMI-PERMANENT (CLASS IV) WETLAND
 - PERMANENT (CLASS V) WETLAND
 - ANTHROPOGENIC WATER BODY/MODIFIED NATURAL WETLAND
 - WETLAND (CLASS III+) SETBACK (100 m)
 - WETLAND SETBACK (5 m)



NOTE 1 - Raptor Nest Interactions:
NA

NOTE 2 - Direct Wetland or Ephemeral Waterbody Interactions (Class I, II, III, IV and V):
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NOTE 3 - Wetlands within 5 m of the Footprint (Ephemeral waterbodies, drainages, Class II and higher):
NA

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NOTE 5 - Direct Wetland Interactions - Class IV Collector Line Crossings:
NA

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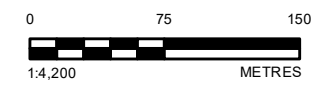
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Category	Applicability	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
Raptor Nest Breeding Period	Raptor Nests and Setbacks			Wildlife Monitor Required when working in Setback									
				15-Mar				15-Jul					
Grassland Breeding Bird Nesting Period (April 1- July 15) and Migratory Bird Nesting Period, Nesting Zone B4 (April 14 - August 28)	All non cultivated areas within 100 m of construction activity.			Nest Sweep Required									
				1-Apr					28-Aug				
Amphibian Active Period (April 15 - September 15)	Direct impacts to Class III, IV and V wetlands, or work within 100 m setbacks of Class III, IV and V wetlands			Pre-Construction Amphibian Survey, Silt Fencing and Amphibian Monitoring Required as per Referral Report*		Pre-Construction Amphibian Survey, Silt Fencing and Amphibian Monitoring Recommended*							
				15-Apr	14-Jun					15-Sep			

*It is recommended that best practices for amphibian mitigation are applied during the frost-free season from about April to September 15.

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2. 2018 ORTHOPHOTO OBTAINED FROM TARIN RESOURCE SERVICES LTD.

PROJECTION: UTM ZONE 12 DATUM: NAD 83



CLIENT **Capital Power**

PROJECT **HALKIRK 2 WIND POWER PROJECT**

TITLE **QUARTER SECTION: SE 34-39-15 W4M**

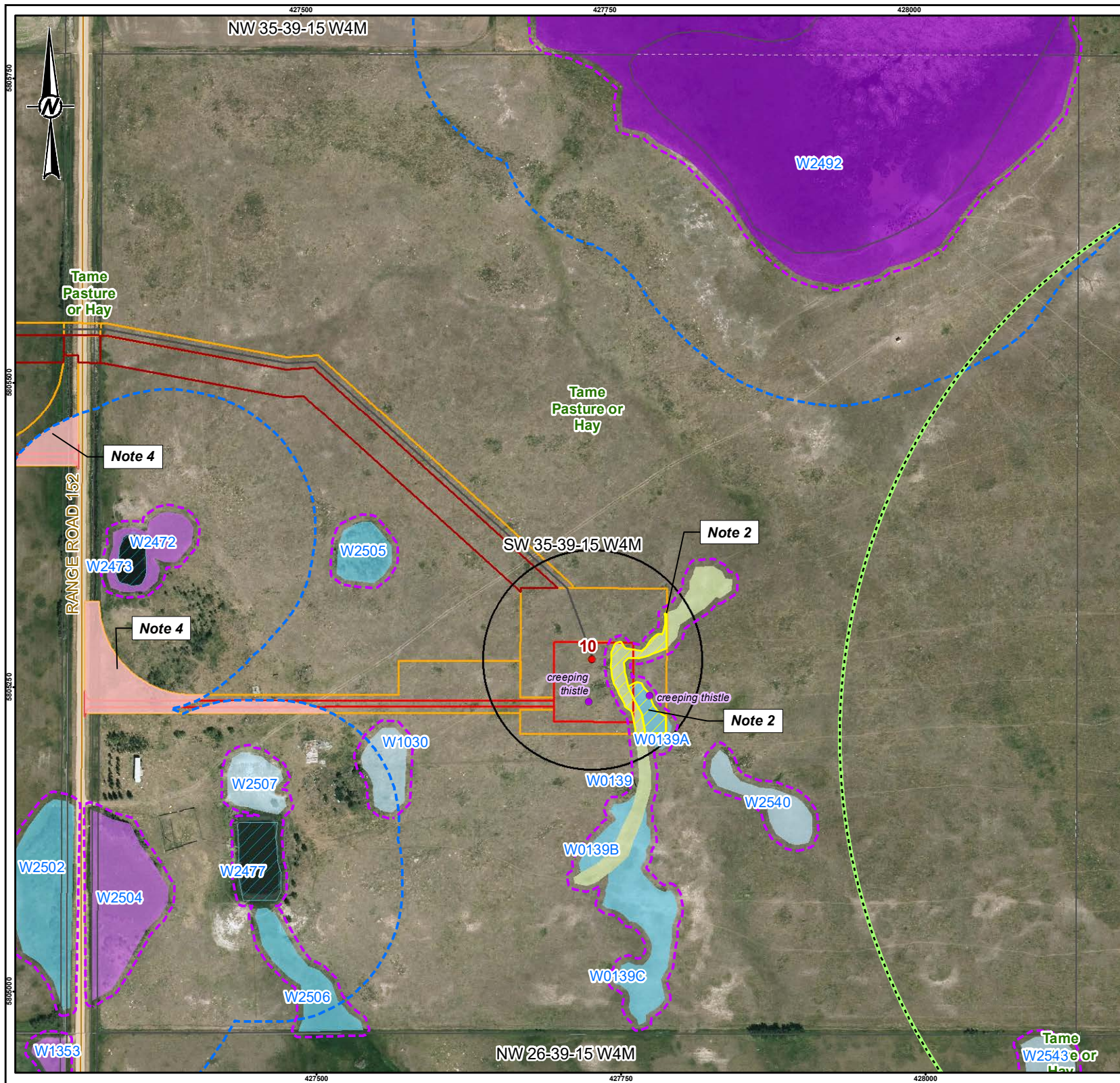
CONSULTANT **wsp**

DESIGNED	REVIEWED	APPROVED
SC	LB	SC

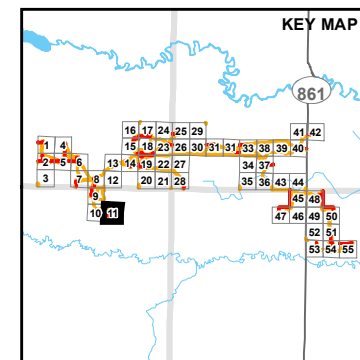
PROJECT NO. 21452763 PHASE REV. 0 FIGURE 10

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IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B



LEGEND		ENVIRONMENTAL CONSTRAINTS		WETLAND AND WATER BODY PERMANENCE		WEED OBSERVATION	
—	CADASTRAL		AREA OF FOOTPRINT INTERACTION/MITIGATION (SEE NOTES)		EPHEMERAL (CLASS I) WATER BODY		NOXIOUS WEED SPECIES OBSERVATION
—	LOCAL ROAD		WETLAND (CLASS III+) SETBACK (100 m) INTERACTION		TEMPORARY (CLASS II) WETLAND		
●	TURBINE		WILDLIFE HABITAT FEATURES NEST SETBACK		SEASONAL (CLASS III) WETLAND		
—	ROTOR-SWEPT AREA				SEMI-PERMANENT (CLASS IV) WETLAND		
—	UNDERGROUND COLLECTOR SYSTEM				ANTHROPOGENIC WATER BODY/MODIFIED NATURAL WETLAND		
—	CRANE PATH				NATURAL DRAINAGE		
—	OPERATION FOOTPRINT				WETLAND (CLASS III+) SETBACK (100 m)		
—	CONSTRUCTION FOOTPRINT				WETLAND SETBACK (5 m)		



NOTE 1 - Raptor Nest Interactions:

NA

NOTE 2 - Direct Wetland or Ephemeral Waterbody Interactions (Class I, II, III, IV and V):

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NOTE 3 - Wetlands within 5 m of the Footprint (Ephemeral waterbodies, drainages, Class II and higher):

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NOTE 5 - Direct Wetland Interactions - Class IV Collector Line Crossings:

NA

GENERAL NOTE - All non cultivated areas within 100 m of construction activities:

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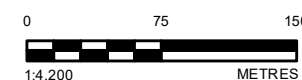
Category	Applicability	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
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				15-Mar				15-Jul					
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					1-Apr				28-Aug				
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					15-Apr	14-Jun				15-Sep			

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2. 2018 ORTHOPHOTO OBTAINED FROM TARIN RESOURCE SERVICES LTD.

PROJECTION: UTM ZONE 12 DATUM: NAD 83

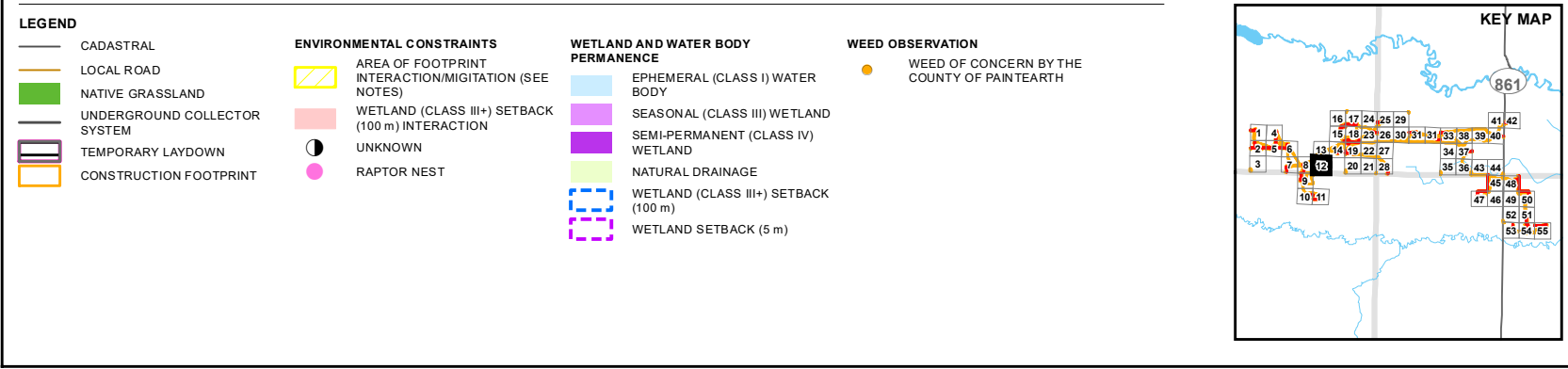
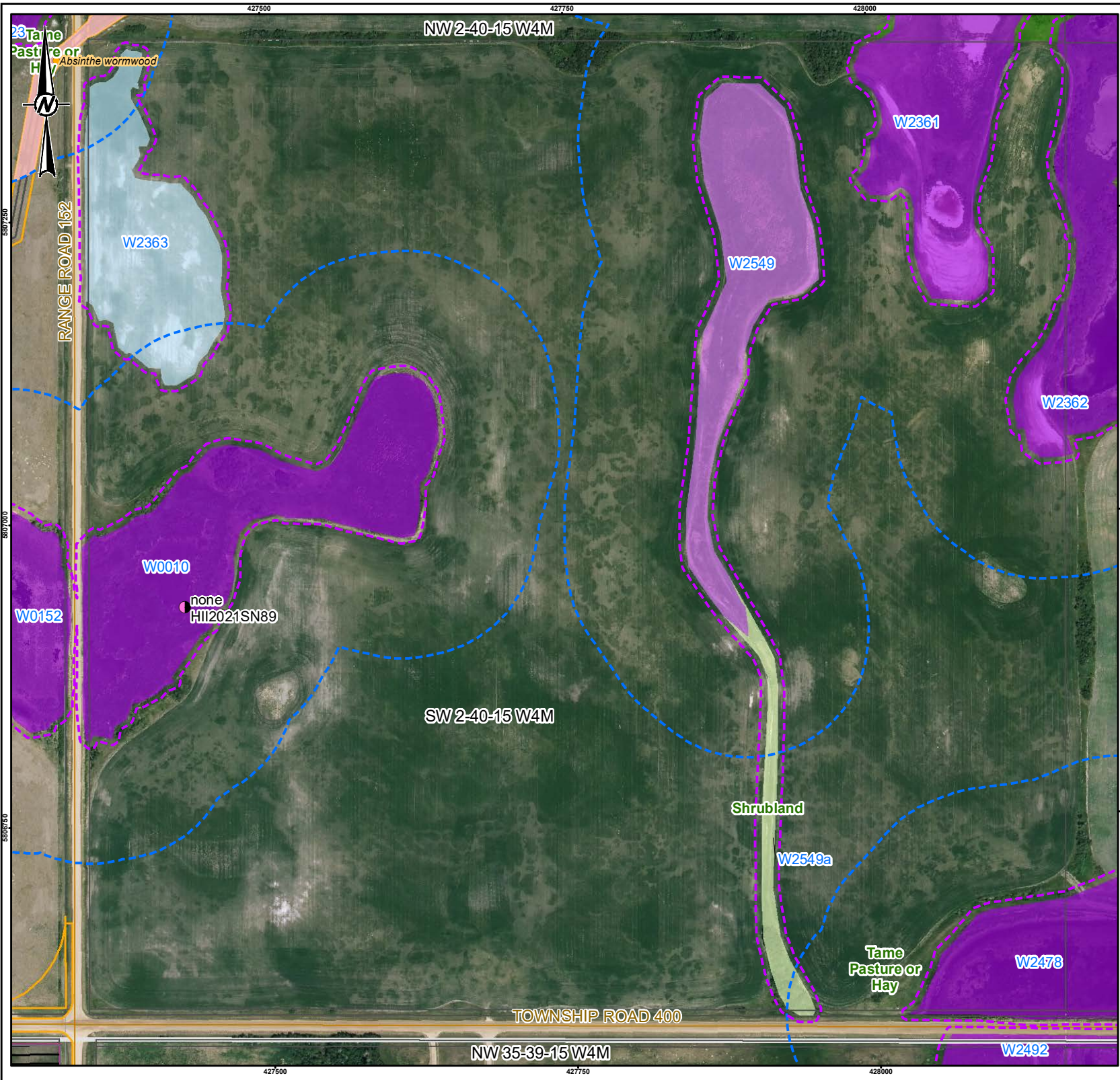


PROJECT
HALKIRK 2 WIND POWER PROJECT

TITLE
QUARTER SECTION: SW 35-39-15 W4M

CONSULTANT	YYYY-MM-DD	2023-09-15
DESIGNED	SC	
PREPARED	LB	
REVIEWED	SC	
APPROVED	SC	

PROJECT NO. 21452763 PHASE REV. 0 FIGURE 11



NOTE 1 - Raptor Nest Interactions:
NA

NOTE 2 - Direct Wetland or Ephemeral Waterbody Interactions (Class I, II, III, IV and V):
NA

NOTE 3 - Wetlands within 5 m of the Footprint (Ephemeral waterbodies, drainages, Class II and higher):
NA

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NOTE 5 - Direct Wetland Interactions - Class IV Collector Line Crossings:
NA

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					1-Apr				28-Aug				
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2. 2018 ORTHOPHOTO OBTAINED FROM TARIN RESOURCE SERVICES LTD.

PROJECTION: UTM ZONE 12 DATUM: NAD 83

CLIENT: **Capital Power**

PROJECT: **HALKIRK 2 WIND POWER PROJECT**

TITLE: **QUARTER SECTION: SW 2-40-15 W4M**

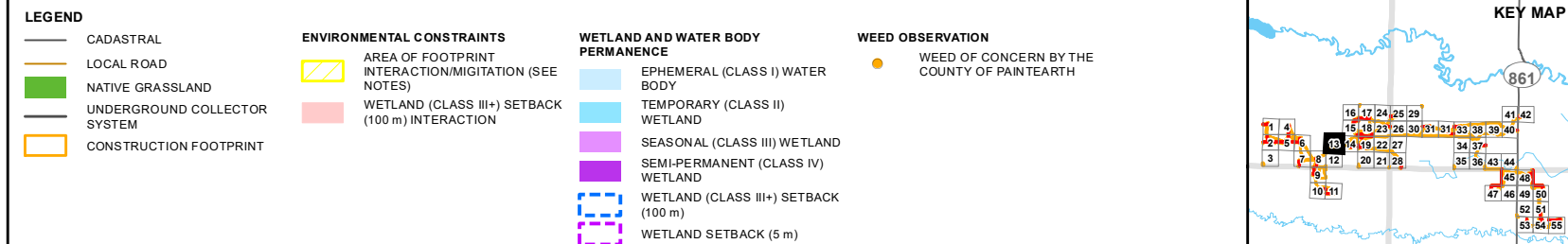
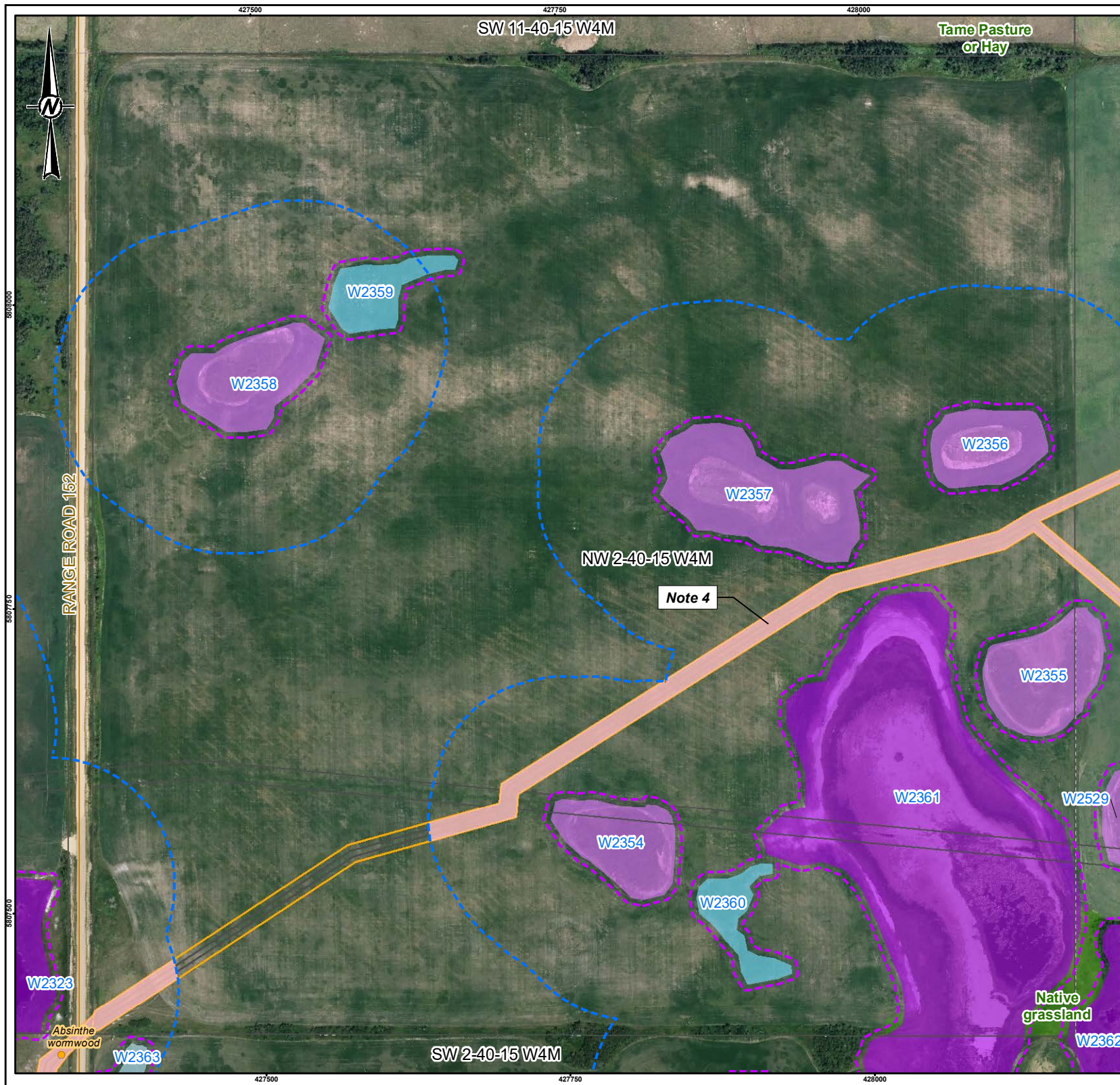
CONSULTANT: **wsp**

YYYY-MM-DD	2023-09-15
DESIGNED	SC
PREPARED	LB
REVIEWED	SC
APPROVED	SC

PROJECT NO. 21452763 PHASE REV. 0 FIGURE 12

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LEGEND

- CADASTRAL
- LOCAL ROAD
- NATIVE GRASSLAND
- UNDERGROUND COLLECTOR SYSTEM
- CONSTRUCTION FOOTPRINT

ENVIRONMENTAL CONSTRAINTS

- AREA OF FOOTPRINT INTERACTION/MITIGATION (SEE NOTES)
- WETLAND (CLASS III+) SETBACK (100 m) INTERACTION

WETLAND AND WATER BODY PERMANENCE

- EPHEMERAL (CLASS I) WATER BODY
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- WETLAND SETBACK (5 m)

WEED OBSERVATION

- WEED OF CONCERN BY THE COUNTY OF PAINTEARTH

NOTE 1 - Raptor Nest Interactions:
NA

NOTE 2 - Direct Wetland or Ephemeral Waterbody Interactions (Class I, II, III, IV and V):
NA

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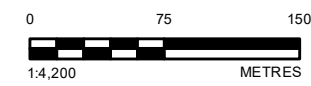
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REFERENCE(S)
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2. 2018 ORTHOPHOTO OBTAINED FROM TARIN RESOURCE SERVICES LTD.

PROJECTION: UTM ZONE 12 DATUM: NAD 83



CLIENT **Capital Power**

PROJECT **HALKIRK 2 WIND POWER PROJECT**

TITLE **QUARTER SECTION: NW 2-40-15 W4M**

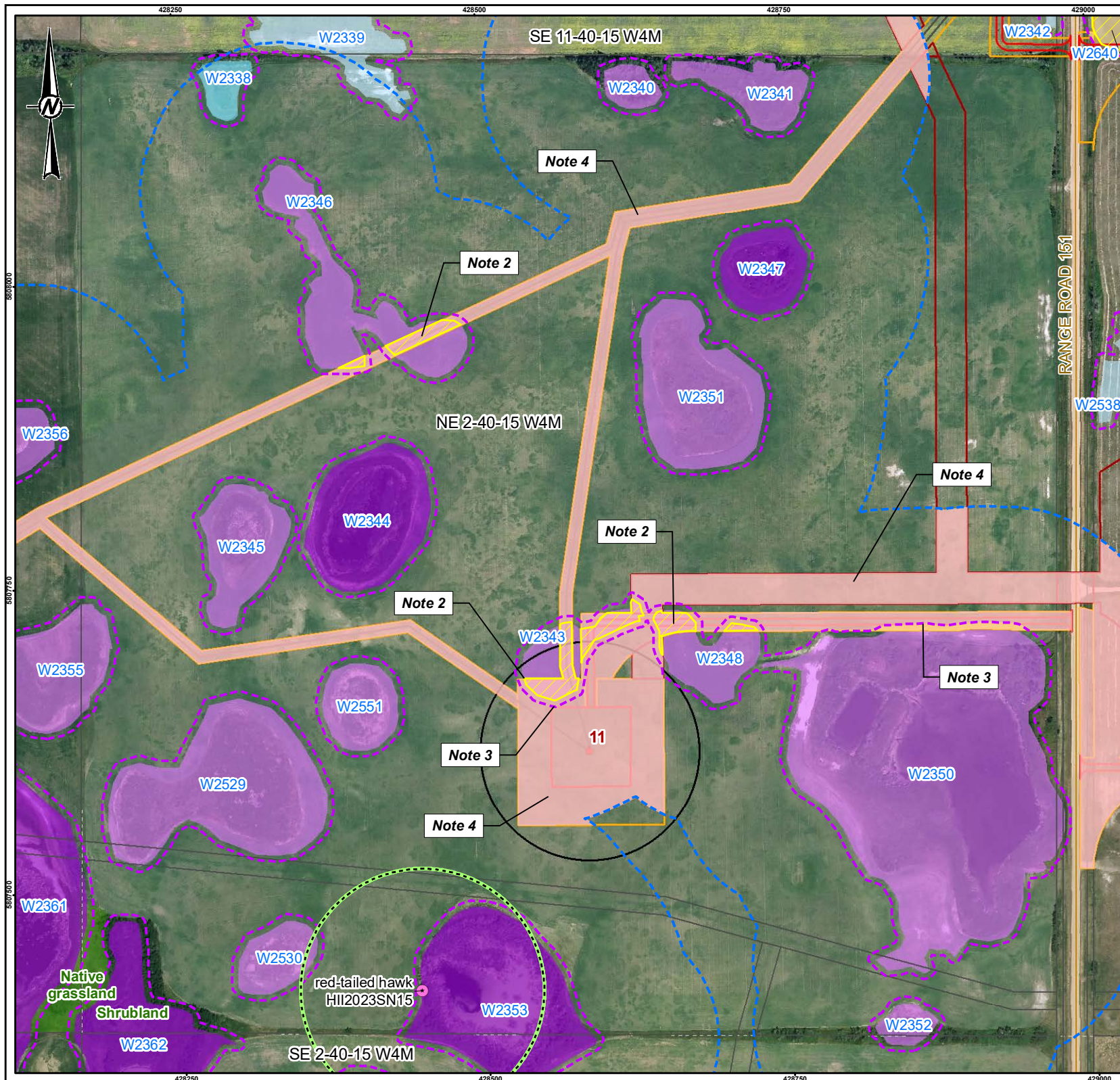
CONSULTANT

YYYY-MM-DD	2023-09-15
DESIGNED	SC
PREPARED	LB
REVIEWED	SC
APPROVED	SC

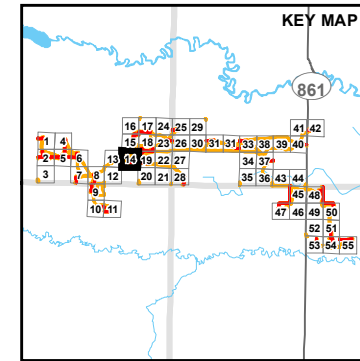
PROJECT NO. **21452763** PHASE REV. **0** FIGURE **13**

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IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B



- LEGEND**
- CADASTRAL**
 - LOCAL ROAD
 - NATIVE GRASSLAND
 - PROJECT LAYOUT**
 - TURBINE
 - ROTOR-SWEPT AREA
 - UNDERGROUND COLLECTOR SYSTEM
 - CRANE PATH
 - SUBSTATION (TEMPORARY)
 - OPERATION FOOTPRINT
 - CONSTRUCTION FOOTPRINT
 - ENVIRONMENTAL CONSTRAINTS**
 - AREA OF FOOTPRINT INTERACTION/MITIGATION (SEE NOTES)
 - WETLAND SETBACK (5 m) INTERACTION (Silt fencing between the Project Footprint and wetland when work cannot be scheduled during dry or frozen periods.)
 - WETLAND (CLASS III+) SETBACK (100 m) INTERACTION
 - WILDLIFE HABITAT FEATURES**
 - NEST SETBACK
 - ACTIVE
 - RAPTOR NEST
 - WETLAND AND WATER BODY PERMANENCE**
 - EPHEMERAL (CLASS I) WATER BODY
 - TEMPORARY (CLASS II) WETLAND
 - SEASONAL (CLASS III) WETLAND
 - SEMI-PERMANENT (CLASS IV) WETLAND
 - WETLAND (CLASS III+) SETBACK (100 m)
 - WETLAND SETBACK (5 m)



NOTE 1 - Raptor Nest Interactions:
NA

NOTE 2 - Direct Wetland or Ephemeral Waterbody Interactions (Class I, II, III, IV and V):
Direct impacts to wetlands can not extend beyond the Project Footprint and as outlined in this plan. Wetland boundaries between the Project footprint and wetland will be marked before construction start, and silt fencing will be installed to prevent vehicle traffic from entering wetlands that extend outside of the footprint when work cannot be scheduled under dry or frozen conditions. Plan construction during dry ground conditions to the extent possible, and use rig matting, geotextiles, vegetated buffer zones, earthen berms as appropriate. Wetlands temporarily disturbed will naturally regenerate from seeds present in the soil and from adjacent areas. Plan construction outside of the sensitive amphibian breeding period or implement mitigations for amphibians when intersecting Class III, IV or V (Refer to Note 4).

NOTE 3 - Wetlands within 5 m of the Footprint (Ephemeral waterbodies, drainages, Class II and higher):
Wetlands, ephemeral water bodies and drainages within 5 m of the Project Footprint will be marked prior to construction. Silt fencing will be installed between the wetland and the nearest edge of the Project Footprint if construction cannot be scheduled during dry or frozen conditions. The Environmental Monitor may require additional silt fencing as required based on site conditions. Alternatively, the Environmental Monitor may determine silt fencing is not needed based on the distance of the wettest edge to the Project Footprint.

NOTE 4 - Within 100 m of a Class III, IV, or V (Amphibians and Waterbirds):
Schedule construction outside of the amphibian active period (i.e., breeding period and post-breeding period to first frost, approximately April 15 to September 15). When construction within 100 m wetlands setbacks with the potential to support amphibian populations cannot be scheduled outside the amphibian active period (April 15 to September 15), a pre-construction amphibian survey will be conducted. If the pre-construction amphibian survey confirms the presence of amphibians, exclusion fencing will be installed and maintained along the nearest edge of the Project Footprint. An experienced wildlife biologist or qualified environmental monitor will conduct an amphibian salvage program, if required. Nest searches will be performed within the 100 m setback by an experienced wildlife biologist, to identify breeding birds or their nests if construction is scheduled between April 1 and August 28. If breeding activity is identified, an appropriate setback buffer will be applied.

NOTE 5 - Direct Wetland Interactions - Class IV Collector Line Crossings:
NA

GENERAL NOTE - All non cultivated areas within 100 m of construction activities:
Schedule construction outside of recommended restricted activity periods (April 1 to August 28) within all non-cultivated habitats. If construction activities occur between April 1 and August 28, non-intrusive, pre-construction nest surveys will be performed an experienced wildlife biologist within 100 m of construction activity prior to construction. If breeding activity is identified, a minimum setback buffer of 100 m will be applied to the suspected nest location until young fledge to minimize the risk of disturbing birds, nests, or eggs. When there is potential for construction activities to pose an elevated risk to wildlife, an experienced wildlife biologist will be on site to monitor wildlife behaviour and to propose on site mitigation actions that should be implemented to reduce risk to wildlife.

GENERAL NOTE - Vegetation Clearing:
Vegetation clearing will be limited to the Project Footprint and the smallest area practicable. Where possible, short shrub species will be "walked down" or simply driven over to preserve the growth crown and root network, thereby enhancing regeneration after construction is complete. Plan vegetation clearing in all non-cultivated habitats outside of the restricted activity period (April 1 – August 28) to the extent possible (refer to General Note – all non-cultivated areas within 100 m of construction activities).

GENERAL NOTE - Clubroot and Weeds:
All vehicles and construction equipment will be clean (i.e., free of soils and vegetative debris) and disinfected (and documented) prior to arrival at the Project area and cleaned prior to leaving the Project area. All vehicles and equipment will be physically cleaned to remove soil and crop debris before traversing between fields as identified by the land agent or Environmental Monitor. Choose low traffic grassy areas near the field exit to complete cleaning when possible. Remove soil and crop debris by knocking or scraping off soil lumps and sweeping loose soil and vegetation from all equipment, vehicles, or tools used during project activities. Compressed air can be used to blow off any residue left on the machinery after scraping. A pressure washer should be used to remove soil and vegetation if the equipment was operated during wet conditions. Salvaged soil materials will not be moved between different sites. Areas that exhibit extensive weed infestations prior to disturbance will have soils salvaged and stockpiled separately to prevent the contamination of larger reclamation soil volumes.

GENERAL NOTE - Turbine Foundation:
Mortality due to foundation construction activities, while not expected, may occur if wildlife falls into or becomes trapped within foundation excavations. To prevent wildlife from inadvertently falling in, open excavations or auger holes will be temporarily fenced off. Open excavations or auger holes left unsupervised will be checked daily to ensure no wildlife is trapped.

Category	Applicability	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
Raptor Nest Breeding Period	Raptor Nests and Setbacks			Wildlife Monitor Required when working in Setback									
				15-Mar				15-Jul					
Grassland Breeding Bird Nesting Period (April 1- July 15) and Migratory Bird Nesting Period, Nesting Zone B4 (April 14 - August 28)	All non cultivated areas within 100 m of construction activity.			Nest Sweep Required									
					1-Apr				28-Aug				
Amphibian Active Period (April 15 - September 15)	Direct impacts to Class III, IV and V wetlands, or work within 100 m setbacks of Class III, IV and V wetlands				Pre-Construction Amphibian Survey, Silt Fencing and Amphibian Monitoring Required as per Referral Report*		Pre-Construction Amphibian Survey, Silt Fencing and Amphibian Monitoring Recommended*						
					15-Apr		14-Jun			15-Sep			

*It is recommended that best practices for amphibian mitigation are applied during the frost-free season from about April to September 15.

REFERENCE(S)
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 2. 2018 ORTHOPHOTO OBTAINED FROM TARIN RESOURCE SERVICES LTD.

PROJECTION: UTM ZONE 12 DATUM: NAD 83

CLIENT **Capital Power**

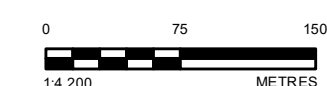
PROJECT **HALKIRK 2 WIND POWER PROJECT**

TITLE **QUARTER SECTION: NE 2-40-15 W4M**

CONSULTANT

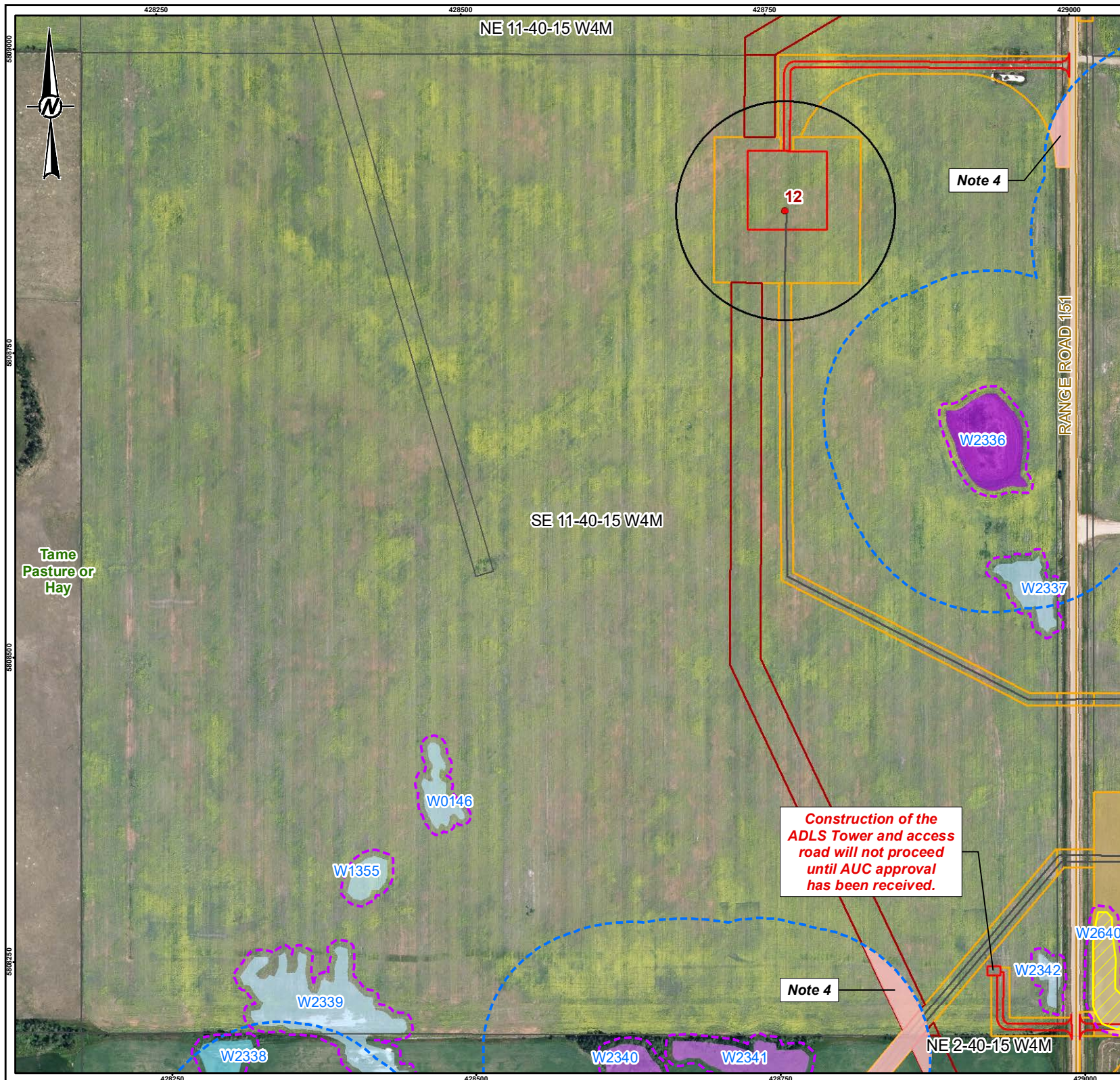
YYYY-MM-DD	2023-09-15
DESIGNED	SC
PREPARED	LB
REVIEWED	SC
APPROVED	SC

PROJECT NO. 21452763 PHASE REV. 0 FIGURE 14



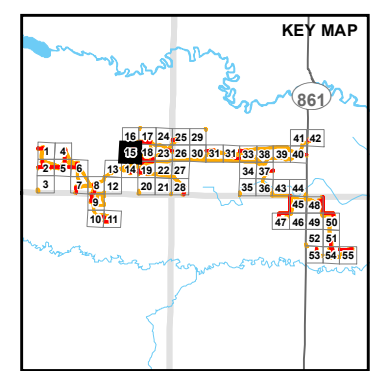
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LEGEND		ENVIRONMENTAL CONSTRAINTS		WETLAND AND WATER BODY PERMANENCE	
	CADASTRAL		AREA OF FOOTPRINT INTERACTION/MITIGATION (SEE NOTES)		EPHEMERAL (CLASS I) WATER BODY
	LOCAL ROAD		WETLAND SETBACK (5 m) INTERACTION (Silt fencing between the Project Footprint and wetland when work cannot be scheduled during dry or frozen periods.)		TEMPORARY (CLASS II) WETLAND
	TURBINE		WETLAND (CLASS III+) SETBACK (100 m) INTERACTION		SEASONAL (CLASS III) WETLAND
	ROTOR-SWEPT AREA				SEMI-PERMANENT (CLASS IV) WETLAND
	UNDERGROUND COLLECTOR SYSTEM				WETLAND (CLASS III+) SETBACK (100 m)
	CRANE PATH				WETLAND SETBACK (5 m)
	SUBSTATION (TEMPORARY)				
	OPERATION FOOTPRINT				
	CONSTRUCTION FOOTPRINT				

Construction of the ADLS Tower and access road will not proceed until AUC approval has been received.



NOTE 1 - Raptor Nest Interactions:
NA

NOTE 2 - Direct Wetland or Ephemeral Waterbody Interactions (Class I, II, III, IV and V):
NA

NOTE 3 - Wetlands within 5 m of the Footprint (Ephemeral waterbodies, drainages, Class II and higher):
NA

NOTE 4 - Within 100 m of a Class III, IV, or V (Amphibians and Waterbirds):
Schedule construction outside of the amphibian active period (i.e., breeding period and post-breeding period to first frost, approximately April 15 to September 15). When construction within 100 m wetlands setbacks with the potential to support amphibian populations cannot be scheduled outside the amphibian active period (April 15 to September 15), a pre-construction amphibian survey will be conducted. If the pre-construction amphibian survey confirms the presence of amphibians, exclusion fencing will be installed and maintained along the nearest edge of the Project Footprint. An experienced wildlife biologist or qualified environmental monitor will conduct an amphibian salvage program, if required. Nest searches will be performed within the 100 m setback by an experienced wildlife biologist, to identify breeding birds or their nests if construction is scheduled between April 1 and August 28. If breeding activity is identified, an appropriate setback buffer will be applied.

NOTE 5 - Direct Wetland Interactions - Class IV Collector Line Crossings:
NA

GENERAL NOTE - All non cultivated areas within 100 m of construction activities:
Schedule construction outside of recommended restricted activity periods (April 1 to August 28) within all non-cultivated habitats. If construction activities occur between April 1 and August 28, non-intrusive, pre-construction nest surveys will be performed an experienced wildlife biologist within 100 m of construction activity prior to construction. If breeding activity is identified, a minimum setback buffer of 100 m will be applied to the suspected nest location until young fledge to minimize the risk of disturbing birds, nests, or eggs. When there is potential for construction activities to pose an elevated risk to wildlife, an experienced wildlife biologist will be on site to monitor wildlife behaviour and to propose on site mitigation actions that should be implemented to reduce risk to wildlife.

GENERAL NOTE - Vegetation Clearing:
Vegetation clearing will be limited to the Project Footprint and the smallest area practicable. Where possible, short shrub species will be "walked down" or simply driven over to preserve the growth crown and root network, thereby enhancing regeneration after construction is complete. Plan vegetation clearing in all non-cultivated habitats outside of the restricted activity period (April 1 – August 28) to the extent possible (refer to General Note – all non-cultivated areas within 100 m of construction activities).

GENERAL NOTE - Clubroot and Weeds:
All vehicles and construction equipment will be clean (i.e., free of soils and vegetative debris) and disinfected (and documented) prior to arrival at the Project area and cleaned prior to leaving the Project area. All vehicles and equipment will be physically cleaned to remove soil and crop debris before traversing between fields as identified by the land agent or Environmental Monitor. Choose low traffic grassy areas near the field exit to complete cleaning when possible. Remove soil and crop debris by knocking or scraping off soil lumps and sweeping loose soil and vegetation from all equipment, vehicles, or tools used during project activities. Compressed air can be used to blow off any residue left on the machinery after scraping. A pressure washer should be used to remove soil and vegetation if the equipment was operated during wet conditions. Salvaged soil materials will not be moved between different sites. Areas that exhibit extensive weed infestations prior to disturbance will have soils salvaged and stockpiled separately to prevent the contamination of larger reclamation soil volumes.

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Category	Applicability	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
Raptor Nest Breeding Period	Raptor Nests and Setbacks			Wildlife Monitor Required when working in Setback									
				15-Mar				15-Jul					
Grassland Breeding Bird Nesting Period (April 1- July 15) and Migratory Bird Nesting Period, Nesting Zone B4 (April 14 - August 28)	All non cultivated areas within 100 m of construction activity.			Nest Sweep Required									
					1-Apr				28-Aug				
Amphibian Active Period (April 15 - September 15)	Direct impacts to Class III, IV and V wetlands, or work within 100 m setbacks of Class III, IV and V wetlands				Pre-Construction Amphibian Survey, Silt Fencing and Amphibian Monitoring Required as per Referral Report*		Pre-Construction Amphibian Survey, Silt Fencing and Amphibian Monitoring Recommended*						
					15-Apr		14-Jun			15-Sep			

*It is recommended that best practices for amphibian mitigation are applied during the frost-free season from about April to September 15.

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PROJECTION: UTM ZONE 12 DATUM: NAD 83



CLIENT **Capital Power**

PROJECT **HALKIRK 2 WIND POWER PROJECT**

TITLE **QUARTER SECTION: SE 11-40-15 W4M**

CONSULTANT **wsp**

YYYY-MM-DD	2023-09-15
DESIGNED	SC
PREPARED	LB
REVIEWED	SC
APPROVED	SC

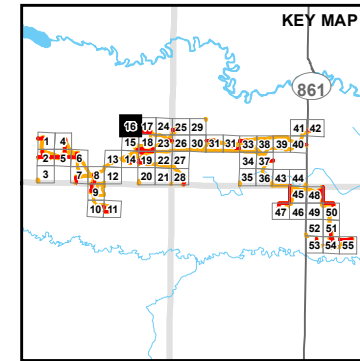
PROJECT NO. 21452763 PHASE APPROVED REV. 0 FIGURE 15

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LEGEND	
	CADASTRAL
	LOCAL ROAD
	NATIVE GRASSLAND
	CRANE PATH
	OPERATION FOOTPRINT
	CONSTRUCTION FOOTPRINT
	AREA OF FOOTPRINT INTERACTION/MITIGATION (SEE NOTES)
	WETLAND (CLASS III+) SETBACK (100 m) INTERACTION
	NATURAL DRAINAGE
	WETLAND (CLASS III+) SETBACK (100 m)
	WETLAND SETBACK (5 m)



- NOTE 1 - Raptor Nest Interactions:**
NA
- NOTE 2 - Direct Wetland or Ephemeral Waterbody Interactions (Class I, II, III, IV and V):**
NA
- NOTE 3 - Wetlands within 5 m of the Footprint (Ephemeral waterbodies, drainages, Class II and higher):**
NA
- NOTE 4 - Within 100 m of a Class III, IV, or V (Amphibians and Waterbirds):**
NA
- NOTE 5 - Direct Wetland Interactions - Class IV Collector Line Crossings:**
NA

GENERAL NOTE - All non cultivated areas within 100 m of construction activities:
Schedule construction outside of recommended restricted activity periods (April 1 to August 28) within all non-cultivated habitats. If construction activities occur between April 1 and August 28, non-intrusive, pre-construction nest surveys will be performed an experienced wildlife biologist within 100 m of construction activity prior to construction. If breeding activity is identified, a minimum setback buffer of 100 m will be applied to the suspected nest location until young fledge to minimize the risk of disturbing birds, nests, or eggs. When there is potential for construction activities to pose an elevated risk to wildlife, an experienced wildlife biologist will be on site to monitor wildlife behaviour and to propose on site mitigation actions that should be implemented to reduce risk to wildlife.

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				15-Mar				15-Jul					
Grassland Breeding Bird Nesting Period (April 1- July 15) and Migratory Bird Nesting Period, Nesting Zone B4 (April 14 - August 28)	All non cultivated areas within 100 m of construction activity.			Nest Sweep Required									
					1-Apr				28-Aug				
Amphibian Active Period (April 15 - September 15)	Direct impacts to Class III, IV and V wetlands, or work within 100 m setbacks of Class III, IV and V wetlands				Pre-Construction Amphibian Survey, Silt Fencing and Amphibian Monitoring Required as per Referral Report*			Pre-Construction Amphibian Survey, Silt Fencing and Amphibian Monitoring Recommended*					
					15-Apr		14-Jun			15-Sep			

*It is recommended that best practices for amphibian mitigation are applied during the frost-free season from about April to September 15.

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2. 2018 ORTHOPHOTO OBTAINED FROM TARIN RESOURCE SERVICES LTD.

PROJECTION: UTM ZONE 12 DATUM: NAD 83



CLIENT

PROJECT
HALKIRK 2 WIND POWER PROJECT

TITLE
QUARTER SECTION: NE 11-40-15 W4M

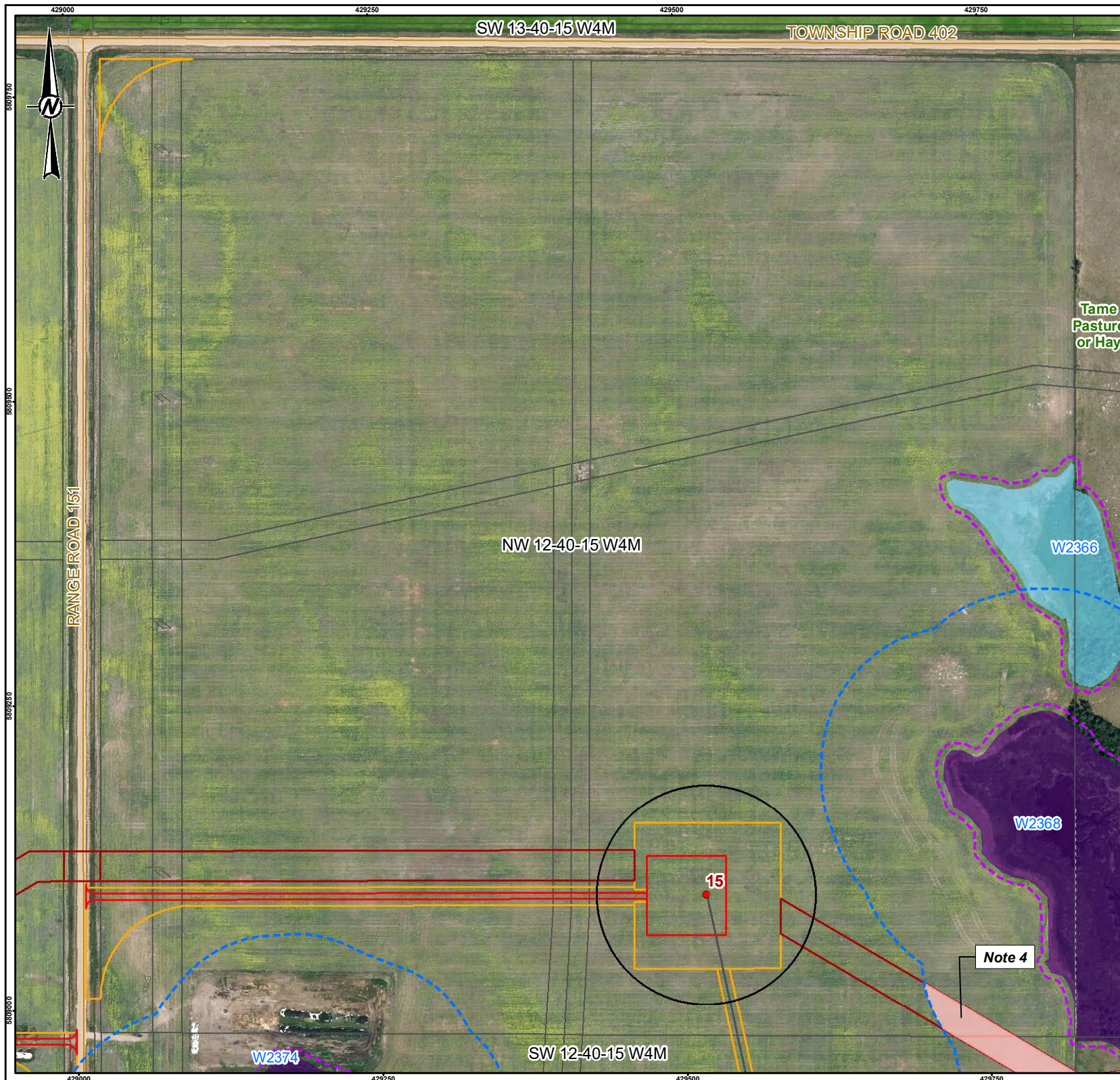
CONSULTANT

YYYY-MM-DD	2023-09-15
DESIGNED	SC
PREPARED	LB
REVIEWED	SC
APPROVED	SC

PROJECT NO. 21452763 PHASE REV. 0 FIGURE 16

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NOTE 1 - Raptor Nest Interactions:
NA

NOTE 2 - Direct Wetland or Ephemeral Waterbody Interactions (Class I, II, III, IV and V):
NA

NOTE 3 - Wetlands within 5 m of the Footprint (Ephemeral waterbodies, drainages, Class II and higher):
NA

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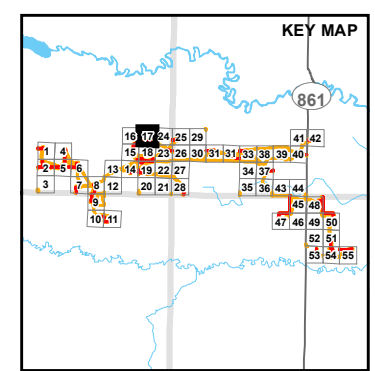
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Category	Applicability	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
Raptor Nest Breeding Period	Raptor Nests and Setbacks			Wildlife Monitor Required when working in Setback									
				15-Mar				15-Jul					
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					1-Apr				28-Aug				
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					15-Apr		14-Jun			15-Sep			

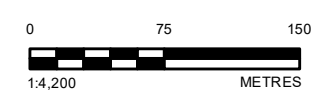
*It is recommended that best practices for amphibian mitigation are applied during the frost-free season from about April to September 15.

- LEGEND**
- CADASTRAL
 - LOCAL ROAD
 - NATIVE GRASSLAND
 - PROJECT LAYOUT
 - TURBINE
 - ROTOR-SWEPT AREA
 - UNDERGROUND COLLECTOR SYSTEM
 - CRANE PATH
 - OPERATION FOOTPRINT
 - CONSTRUCTION FOOTPRINT
- ENVIRONMENTAL CONSTRAINTS**
- AREA OF FOOTPRINT INTERACTION/MITIGATION (SEE NOTES)
 - WETLAND (CLASS III+) SETBACK (100 m) INTERACTION
- WETLAND AND WATER BODY PERMANENCE**
- TEMPORARY (CLASS II) WETLAND
 - PERMANENT (CLASS V) WETLAND
 - WETLAND (CLASS III+) SETBACK (100 m)
 - WETLAND SETBACK (5 m)



REFERENCE(S)
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2. 2018 ORTHOPHOTO OBTAINED FROM TARIN RESOURCE SERVICES LTD.

PROJECTION: UTM ZONE 12 DATUM: NAD 83



CLIENT **Capital Power**

PROJECT **HALKIRK 2 WIND POWER PROJECT**

TITLE **QUARTER SECTION: NW 12-40-15 W4M**

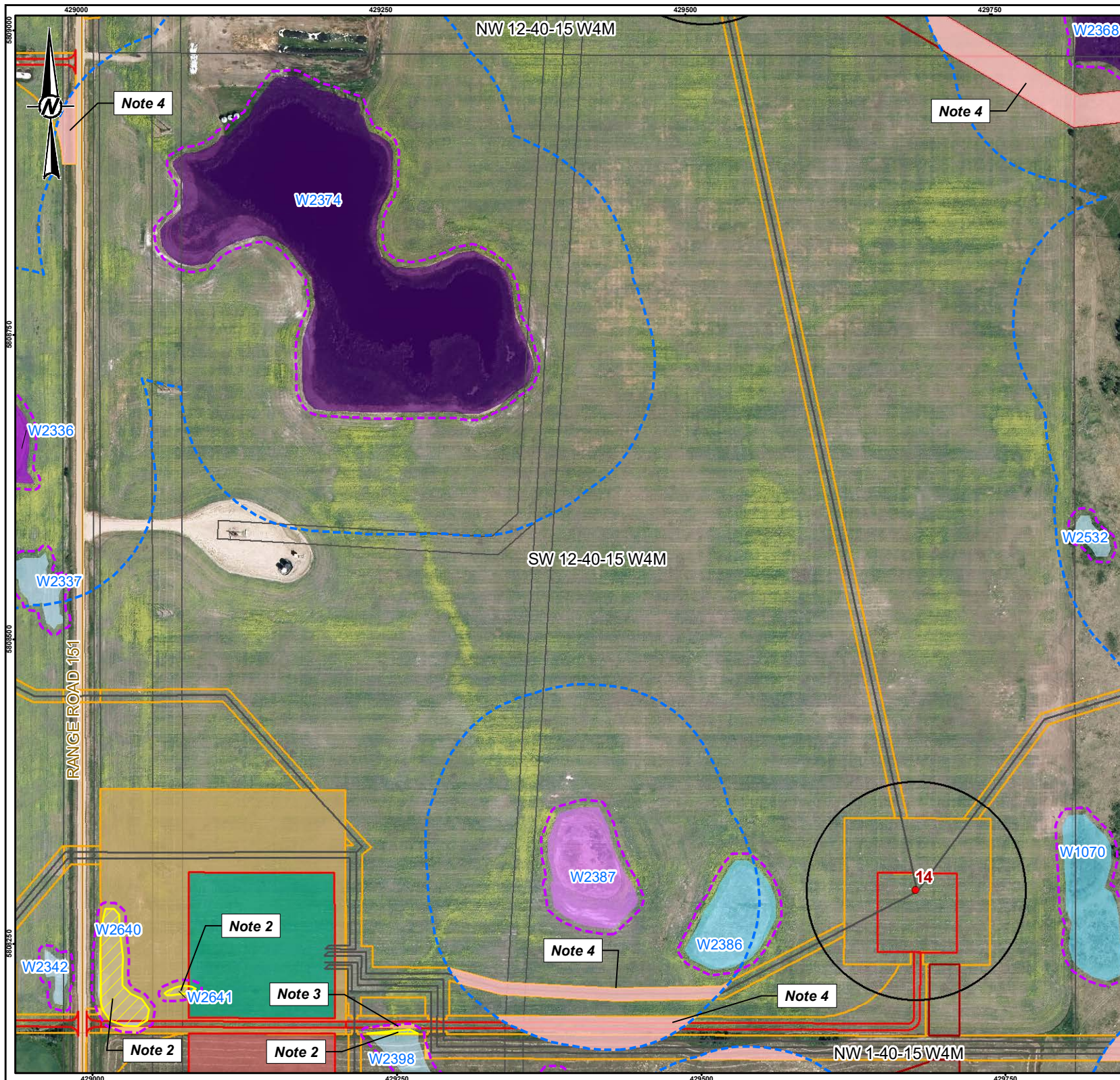
CONSULTANT **wsp**

YYYY-MM-DD	2023-09-15
DESIGNED	SC
PREPARED	LB
REVIEWED	SC
APPROVED	SC

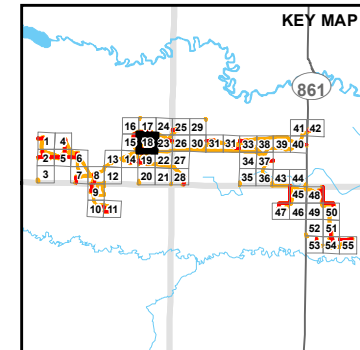
PROJECT NO. 21452763 PHASE APPROVED REV. 0 FIGURE 17

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IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B



LEGEND		ENVIRONMENTAL CONSTRAINTS		WETLAND AND WATER BODY PERMANENCE	
	CADASTRAL		AREA OF FOOTPRINT INTERACTION/MITIGATION (SEE NOTES)		EPHEMERAL (CLASS I) WATER BODY
	LOCAL ROAD		WETLAND SETBACK (5 m) INTERACTION (Silt fencing between the Project Footprint and wetland when work cannot be scheduled during dry or frozen periods.)		TEMPORARY (CLASS II) WETLAND
	TURBINE		WETLAND (CLASS III+) SETBACK (100 m) INTERACTION		SEASONAL (CLASS III) WETLAND
	ROTOR-SWEPT AREA				SEMI-PERMANENT (CLASS IV) WETLAND
	UNDERGROUND COLLECTOR SYSTEM				PERMANENT (CLASS V) WETLAND
	CRANE PATH				WETLAND (CLASS III+) SETBACK (100 m)
	OPERATIONS & MAINTENANCE				WETLAND SETBACK (5 m)
	SUBSTATION (PERMANENT)				
	SUBSTATION (TEMPORARY)				
	OPERATION FOOTPRINT				
	CONSTRUCTION FOOTPRINT				



NOTE 1 - Raptor Nest Interactions:
NA

NOTE 2 - Direct Wetland or Ephemeral Waterbody Interactions (Class I, II, III, IV and V):
Direct impacts to wetlands can not extend beyond the Project Footprint and as outlined in this plan. Wetland boundaries between the Project footprint and wetland will be marked before construction start, and silt fencing will be installed to prevent vehicle traffic from entering wetlands that extend outside of the footprint when work cannot be scheduled under dry or frozen conditions. Plan construction during dry ground conditions to the extent possible, and use rig matting, geotextiles, vegetated buffer zones, earthen berms as appropriate. Wetlands temporarily disturbed will naturally regenerate from seeds present in the soil and from adjacent areas. Plan construction outside of the sensitive amphibian breeding period or implement mitigations for amphibians when intersecting Class III, IV or V (Refer to Note 4).

NOTE 3 - Wetlands within 5 m of the Footprint (Ephemeral waterbodies, drainages, Class II and higher):
Wetlands, ephemeral water bodies and drainages within 5 m of the Project Footprint will be marked prior to construction. Silt fencing will be installed between the wetland and the nearest edge of the Project Footprint if construction cannot be scheduled during dry or frozen conditions. The Environmental Monitor may require additional silt fencing as required based on site conditions. Alternatively, the Environmental Monitor may determine silt fencing is not needed based on the distance of the wettest edge to the Project Footprint.

NOTE 4 - Within 100 m of a Class III, IV, or V (Amphibians and Waterbirds):
Schedule construction outside of the amphibian active period (i.e., breeding period and post-breeding period to first frost, approximately April 15 to September 15). When construction within 100 m wetlands setbacks with the potential to support amphibian populations cannot be scheduled outside the amphibian active period (April 15 to September 15), a pre-construction amphibian survey will be conducted. If the pre-construction amphibian survey confirms the presence of amphibians, exclusion fencing will be installed and maintained along the nearest edge of the Project Footprint. An experienced wildlife biologist or qualified environmental monitor will conduct an amphibian salvage program, if required. Nest searches will be performed within the 100 m setback by an experienced wildlife biologist, to identify breeding birds or their nests if construction is scheduled between April 1 and August 28. If breeding activity is identified, an appropriate setback buffer will be applied.

NOTE 5 - Direct Wetland Interactions - Class IV Collector Line Crossings:
NA

GENERAL NOTE - All non cultivated areas within 100 m of construction activities:
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GENERAL NOTE - Vegetation Clearing:
Vegetation clearing will be limited to the Project Footprint and the smallest area practicable. Where possible, short shrub species will be "walked down" or simply driven over to preserve the growth crown and root network, thereby enhancing regeneration after construction is complete. Plan vegetation clearing in all non-cultivated habitats outside of the restricted activity period (April 1 – August 28) to the extent possible (refer to General Note – all non-cultivated areas within 100 m of construction activities).

GENERAL NOTE - Clubroot and Weeds:
All vehicles and construction equipment will be clean (i.e., free of soils and vegetative debris) and disinfected (and documented) prior to arrival at the Project area and cleaned prior to leaving the Project area. All vehicles and equipment will be physically cleaned to remove soil and crop debris before traversing between fields as identified by the land agent or Environmental Monitor. Choose low traffic grassy areas near the field exit to complete cleaning when possible. Remove soil and crop debris by knocking or scraping off soil lumps and sweeping loose soil and vegetation from all equipment, vehicles, or tools used during project activities. Compressed air can be used to blow off any residue left on the machinery after scraping. A pressure washer should be used to remove soil and vegetation if the equipment was operated during wet conditions. Salvaged soil materials will not be moved between different sites. Areas that exhibit extensive weed infestations prior to disturbance will have soils salvaged and stockpiled separately to prevent the contamination of larger reclamation soil volumes.

GENERAL NOTE - Turbine Foundation:
Mortality due to foundation construction activities, while not expected, may occur if wildlife falls into or becomes trapped within foundation excavations. To prevent wildlife from inadvertently falling in, open excavations or auger holes will be temporarily fenced off. Open excavations or auger holes left unsupervised will be checked daily to ensure no wildlife is trapped.

Category	Applicability	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
Raptor Nest Breeding Period	Raptor Nests and Setbacks			Wildlife Monitor Required when working in Setback									
				15-Mar				15-Jul					
Grassland Breeding Bird Nesting Period (April 1- July 15) and Migratory Bird Nesting Period, Nesting Zone B4 (April 14 - August 28)	All non cultivated areas within 100 m of construction activity.			Nest Sweep Required									
					1-Apr				28-Aug				
Amphibian Active Period (April 15 - September 15)	Direct impacts to Class III, IV and V wetlands, or work within 100 m setbacks of Class III, IV and V wetlands				Pre-Construction Amphibian Survey, Silt Fencing and Amphibian Monitoring Required as per Referral Report*		Pre-Construction Amphibian Survey, Silt Fencing and Amphibian Monitoring Recommended*						
					15-Apr		14-Jun			15-Sep			

*It is recommended that best practices for amphibian mitigation are applied during the frost-free season from about April to September 15.

REFERENCE(S)
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2. 2018 ORTHOPHOTO OBTAINED FROM TARIN RESOURCE SERVICES LTD.

PROJECTION: UTM ZONE 12 DATUM: NAD 83

CLIENT **Capital Power**

PROJECT **HALKIRK 2 WIND POWER PROJECT**

TITLE **QUARTER SECTION: SW 12-40-15 W4M**

CONSULTANT

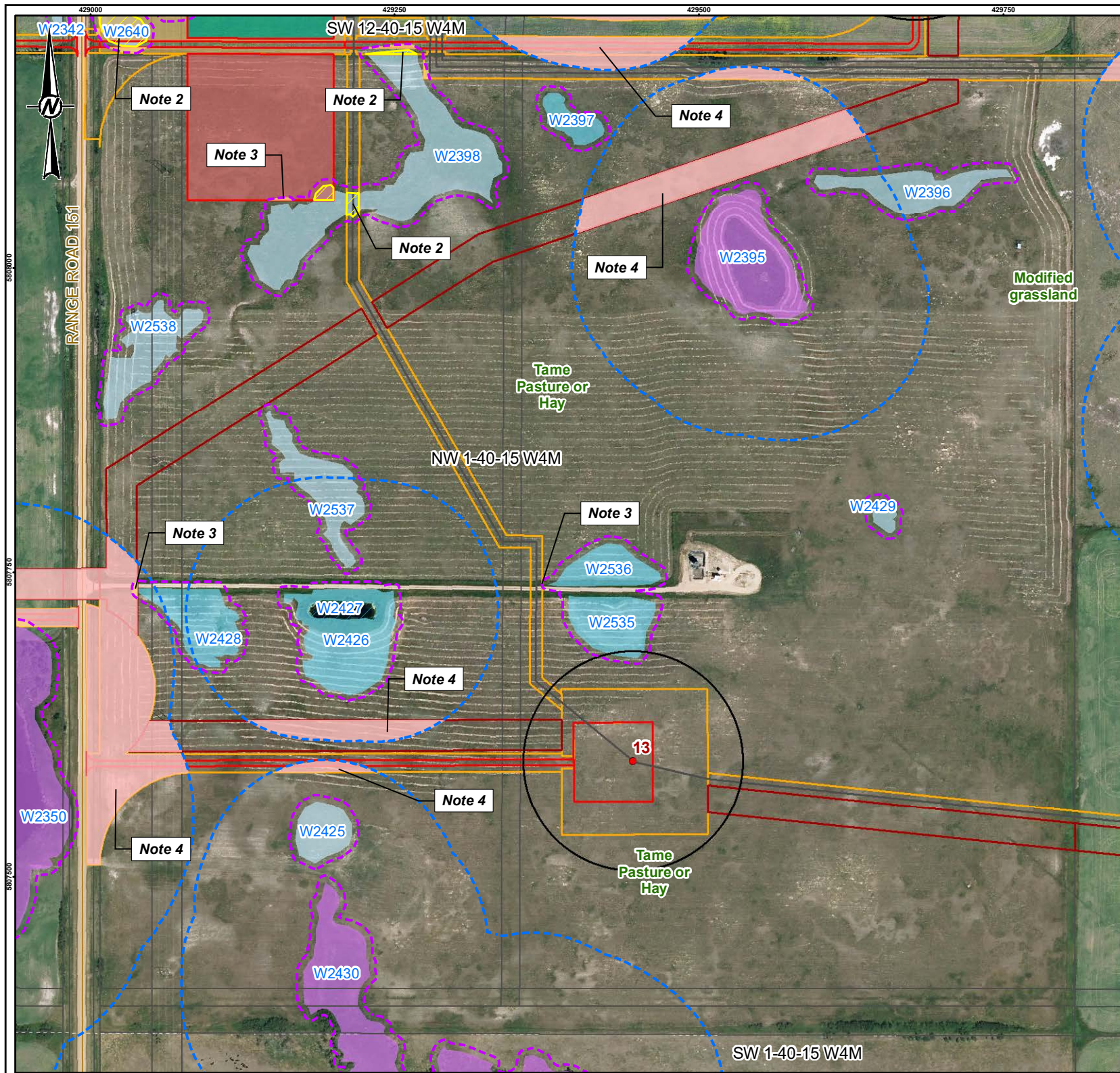
YYYY-MM-DD	2023-09-15
DESIGNED	SC
PREPARED	LB
REVIEWED	SC
APPROVED	SC

PROJECT NO. 21452763 PHASE REV. 0 FIGURE 18

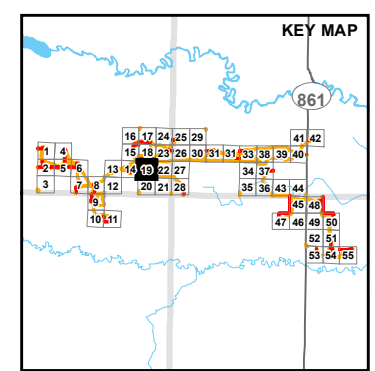


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IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B



LEGEND		ENVIRONMENTAL CONSTRAINTS		WETLAND AND WATER BODY PERMANENCE	
	CAUDASTRAL		AREA OF FOOTPRINT INTERACTION/MITIGATION (SEE NOTES)		EPHEMERAL (CLASS I) WATER BODY
	LOCAL ROAD		WETLAND SETBACK (5 m) INTERACTION (Silt fencing between the Project Footprint and wetland when work cannot be scheduled during dry or frozen periods.)		TEMPORARY (CLASS II) WETLAND
	TURBINE		WETLAND (CLASS III+) SETBACK (100 m) INTERACTION		SEASONAL (CLASS III) WETLAND
	ROTOR-SWEPT AREA				ANTHROPOGENIC WATER BODY/MODIFIED NATURAL WETLAND
	UNDERGROUND COLLECTOR SYSTEM				WETLAND (CLASS III+) SETBACK (100 m)
	CRANE PATH				WETLAND SETBACK (5 m)
	OPERATIONS & MAINTENANCE				
	SUBSTATION (PERMANENT)				
	SUBSTATION (TEMPORARY)				
	OPERATION FOOTPRINT				
	CONSTRUCTION FOOTPRINT				



NOTE 1 - Raptor Nest Interactions:

NA

NOTE 2 - Direct Wetland or Ephemeral Waterbody Interactions (Class I, II, III, IV and V):

Direct impacts to wetlands can not extend beyond the Project Footprint and as outlined in this plan. Wetland boundaries between the Project footprint and wetland will be marked before construction start, and silt fencing will be installed to prevent vehicle traffic from entering wetlands that extend outside of the footprint when work cannot be scheduled under dry or frozen conditions. Plan construction during dry ground conditions to the extent possible, and use rig matting, geotextiles, vegetated buffer zones, earthen berms as appropriate. Wetlands temporarily disturbed will naturally regenerate from seeds present in the soil and from adjacent areas. Plan construction outside of the sensitive amphibian breeding period or implement mitigations for amphibians when intersecting Class III, IV or V (Refer to Note 4).

NOTE 3 - Wetlands within 5 m of the Footprint (Ephemeral waterbodies, drainages, Class II and higher):

Wetlands, ephemeral water bodies and drainages within 5 m of the Project Footprint will be marked prior to construction. Silt fencing will be installed between the wetland and the nearest edge of the Project Footprint if construction cannot be scheduled during dry or frozen conditions. The Environmental Monitor may require additional silt fencing as required based on site conditions. Alternatively, the Environmental Monitor may determine silt fencing is not needed based on the distance of the wettest edge to the Project Footprint.

NOTE 4 - Within 100 m of a Class III, IV, or V (Amphibians and Waterbirds):

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NOTE 5 - Direct Wetland Interactions - Class IV Collector Line Crossings:

NA

GENERAL NOTE - All non cultivated areas within 100 m of construction activities:

Schedule construction outside of recommended restricted activity periods (April 1 to August 28) within all non-cultivated habitats. If construction activities occur between April 1 and August 28, non-intrusive, pre-construction nest surveys will be performed an experienced wildlife biologist within 100 m of construction activity prior to construction. If breeding activity is identified, a minimum setback buffer of 100 m will be applied to the suspected nest location until young fledge to minimize the risk of disturbing birds, nests, or eggs. When there is potential for construction activities to pose an elevated risk to wildlife, an experienced wildlife biologist will be on site to monitor wildlife behaviour and to propose on site mitigation actions that should be implemented to reduce risk to wildlife.

GENERAL NOTE - Vegetation Clearing:

Vegetation clearing will be limited to the Project Footprint and the smallest area practicable. Where possible, short shrub species will be "walked down" or simply driven over to preserve the growth crown and root network, thereby enhancing regeneration after construction is complete. Plan vegetation clearing in all non-cultivated habitats outside of the restricted activity period (April 1 – August 28) to the extent possible (refer to General Note – all non-cultivated areas within 100 m of construction activities).

GENERAL NOTE - Clubroot and Weeds:

All vehicles and construction equipment will be clean (i.e., free of soils and vegetative debris) and disinfected (and documented) prior to arrival at the Project area and cleaned prior to leaving the Project area. All vehicles and equipment will be physically cleaned to remove soil and crop debris before traversing between fields as identified by the land agent or Environmental Monitor. Choose low traffic grassy areas near the field exit to complete cleaning when possible. Remove soil and crop debris by knocking or scraping off soil lumps and sweeping loose soil and vegetation from all equipment, vehicles, or tools used during project activities. Compressed air can be used to blow off any residue left on the machinery after scraping. A pressure washer should be used to remove soil and vegetation if the equipment was operated during wet conditions. Salvaged soil materials will not be moved between different sites. Areas that exhibit extensive weed infestations prior to disturbance will have soils salvaged and stockpiled separately to prevent the contamination of larger reclamation soil volumes.

GENERAL NOTE - Turbine Foundation:

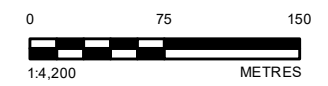
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Category	Applicability	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
Raptor Nest Breeding Period	Raptor Nests and Setbacks			Wildlife Monitor Required when working in Setback									
				15-Mar				15-Jul					
Grassland Breeding Bird Nesting Period (April 1- July 15) and Migratory Bird Nesting Period, Nesting Zone B4 (April 14 - August 28)	All non cultivated areas within 100 m of construction activity.			Nest Sweep Required									
					1-Apr				28-Aug				
Amphibian Active Period (April 15 - September 15)	Direct impacts to Class III, IV and V wetlands, or work within 100 m setbacks of Class III, IV and V wetlands				Pre-Construction Amphibian Survey, Silt Fencing and Amphibian Monitoring Required as per Referral Report*		Pre-Construction Amphibian Survey, Silt Fencing and Amphibian Monitoring Recommended*						
					15-Apr	14-Jun				15-Sep			

*It is recommended that best practices for amphibian mitigation are applied during the frost-free season from about April to September 15.

REFERENCE(S)
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 2. 2018 ORTHOPHOTO OBTAINED FROM TARIN RESOURCE SERVICES LTD.

PROJECTION: UTM ZONE 12 DATUM: NAD 83



CLIENT **Capital Power**

PROJECT **HALKIRK 2 WIND POWER PROJECT**

TITLE **QUARTER SECTION: NW 1-40-15 W4M**

CONSULTANT **wsp**

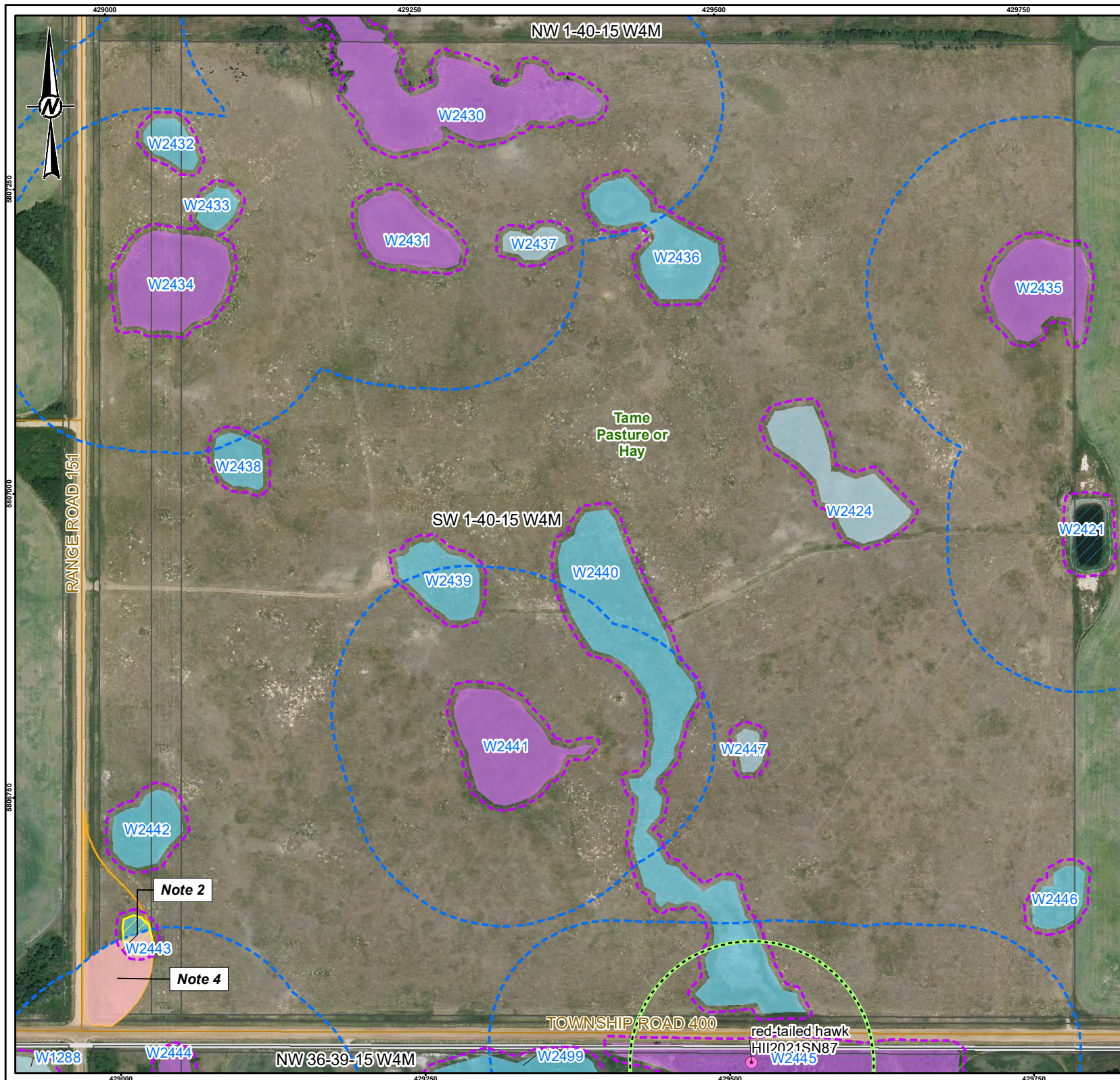
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PREPARED	LB
REVIEWED	SC
APPROVED	SC

PROJECT NO. 21452763 PHASE 0 REV. 0

FIGURE 19

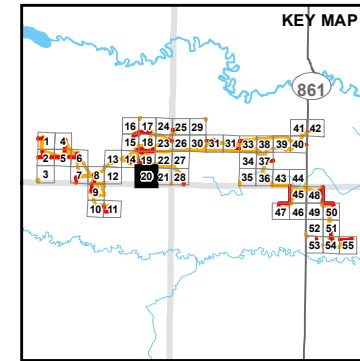
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IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B



LEGEND

CADASTRAL	ENVIRONMENTAL CONSTRAINTS	WETLAND AND WATER BODY PERMANENCE
LOCAL ROAD	AREA OF FOOTPRINT INTERACTION/MITIGATION (SEE NOTES)	EPHEMERAL (CLASS I) WATER BODY
CONSTRUCTION FOOTPRINT	WETLAND (CLASS III+) SETBACK (100 m) INTERACTION	TEMPORARY (CLASS II) WETLAND
	WILDLIFE HABITAT FEATURES	SEASONAL (CLASS III) WETLAND
	NEST SETBACK	ANTHROPOGENIC WATER BODY/MODIFIED NATURAL WETLAND
	ACTIVE	WETLAND (CLASS III+) SETBACK (100 m)
	RAPTOR NEST	WETLAND SETBACK (5 m)



NOTE 1 - Raptor Nest Interactions:
NA

NOTE 2 - Direct Wetland or Ephemeral Waterbody Interactions (Class I, II, III, IV and V):
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NOTE 3 - Wetlands within 5 m of the Footprint (Ephemeral waterbodies, drainages, Class II and higher):
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NOTE 5 - Direct Wetland Interactions - Class IV Collector Line Crossings:
NA

GENERAL NOTE - All non cultivated areas within 100 m of construction activities:
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				15-Mar				15-Jul					
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Amphibian Active Period (April 15 - September 15)	Direct impacts to Class III, IV and V wetlands, or work within 100 m setbacks of Class III, IV and V wetlands			Pre-Construction Amphibian Survey, Silt Fencing and Amphibian Monitoring Required as per Referral Report*				Pre-Construction Amphibian Survey, Silt Fencing and Amphibian Monitoring Recommended*					
				15-Apr		14-Jun				15-Sep			

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2. 2018 ORTHOPHOTO OBTAINED FROM TARIN RESOURCE SERVICES LTD.

PROJECTION: UTM ZONE 12 DATUM: NAD 83

CLIENT

PROJECT
HALKIRK 2 WIND POWER PROJECT

TITLE
QUARTER SECTION: SW 1-40-15 W4M

CONSULTANT

YYYY-MM-DD	2023-09-15
DESIGNED	SC
PREPARED	LB
REVIEWED	SC
APPROVED	SC

PROJECT NO. 21452763 PHASE REV. 0 FIGURE 20



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IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B



NOTE 1 - Raptor Nest Interactions:
NA

NOTE 2 - Direct Wetland or Ephemeral Waterbody Interactions (Class I, II, III, IV and V):
NA

NOTE 3 - Wetlands within 5 m of the Footprint (Ephemeral waterbodies, drainages, Class II and higher):
NA

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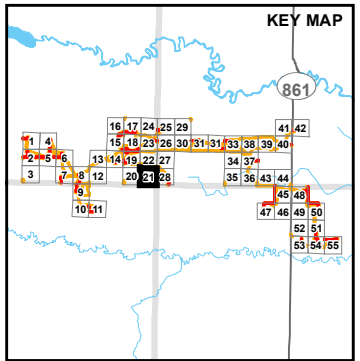
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					1-Apr				28-Aug				
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				15-Apr	14-Jun					15-Sep			

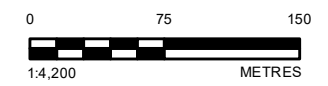
*It is recommended that best practices for amphibian mitigation are applied during the frost-free season from about April to September 15.

- LEGEND**
- CADASTRAL
 - LOCAL ROAD
 - CONSTRUCTION FOOTPRINT
- ENVIRONMENTAL CONSTRAINTS**
- AREA OF FOOTPRINT INTERACTION/MITIGATION (SEE NOTES)
 - WETLAND (CLASS III+) SETBACK (100 m) INTERACTION
- WETLAND AND WATER BODY PERMANENCE**
- EPHEMERAL (CLASS I) WATER BODY
 - TEMPORARY (CLASS II) WETLAND
 - SEASONAL (CLASS III) WETLAND
 - ANTHROPOGENIC WATER BODY/MODIFIED NATURAL WETLAND
 - WETLAND (CLASS III+) SETBACK (100 m)
 - WETLAND SETBACK (5 m)
- WEED OBSERVATION**
- NOXIOUS WEED SPECIES OBSERVATION



REFERENCE(S)
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2. 2018 ORTHOPHOTO OBTAINED FROM TARIN RESOURCE SERVICES LTD.

PROJECTION: UTM ZONE 12 DATUM: NAD 83



CLIENT **Capital Power**

PROJECT **HALKIRK 2 WIND POWER PROJECT**

TITLE **QUARTER SECTION: SE 1-40-15 W4M**

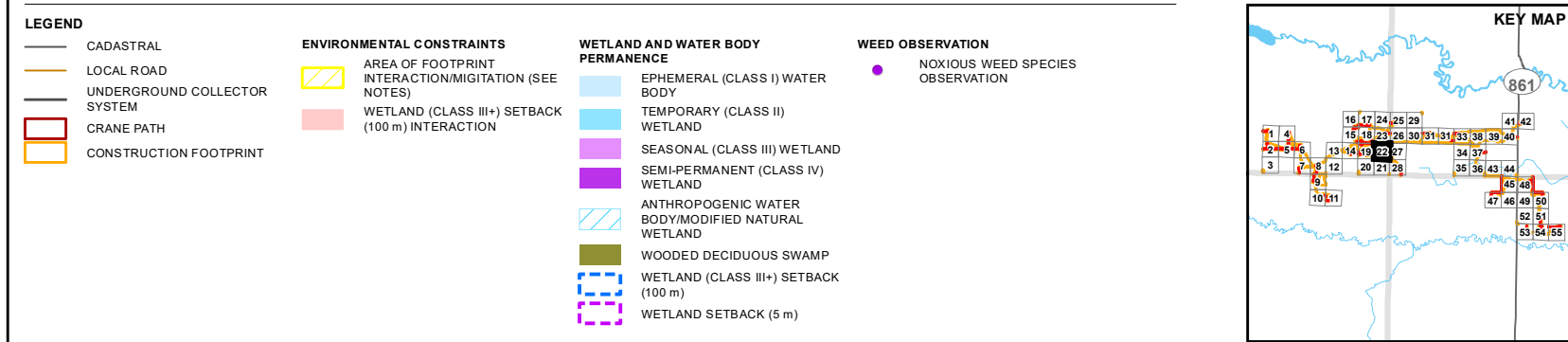
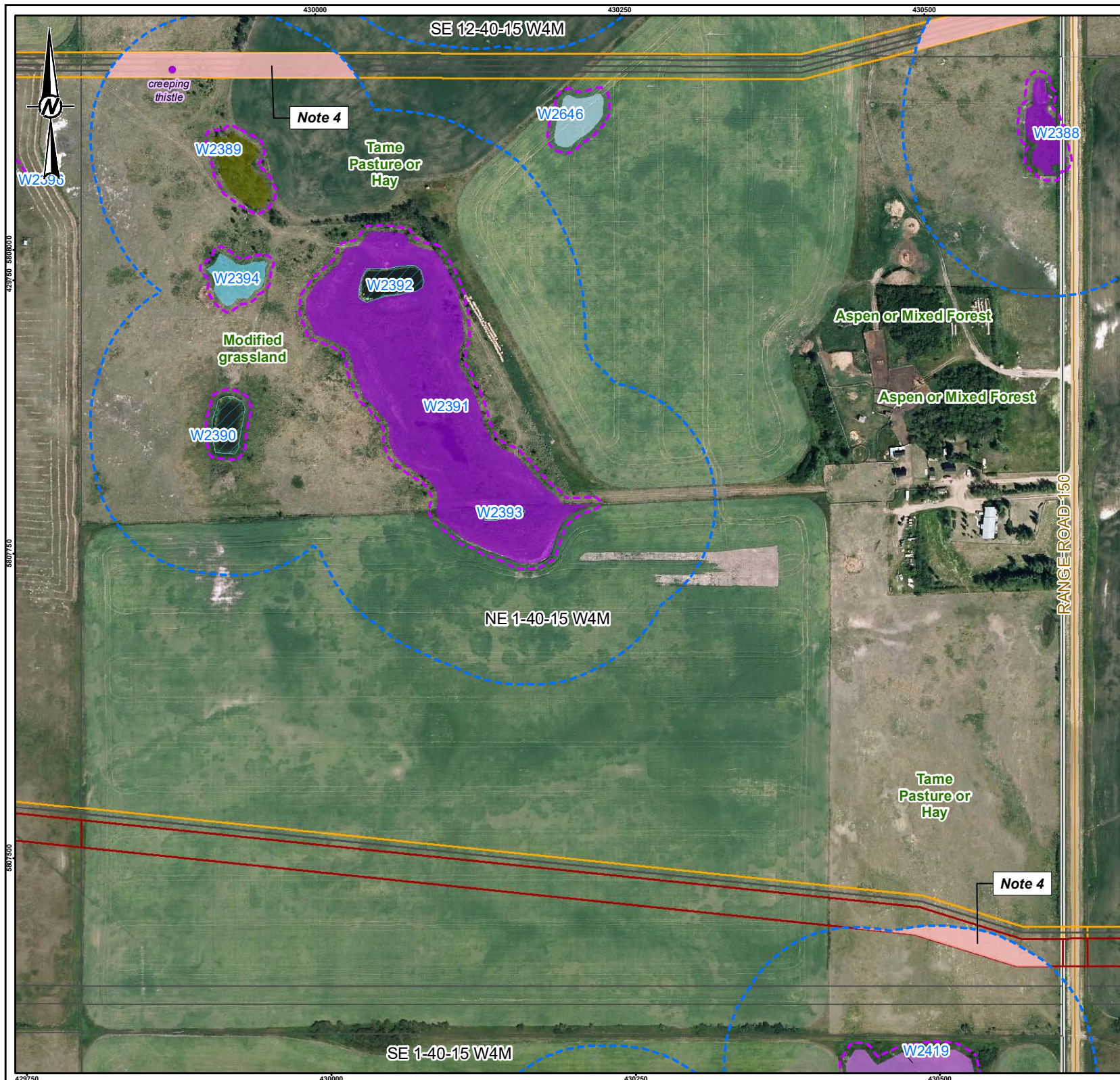
CONSULTANT **wsp**

YYYY-MM-DD	2023-09-15
DESIGNED	SC
PREPARED	LB
REVIEWED	SC
APPROVED	SC

PROJECT NO. 21452763 PHASE REV. 0 FIGURE 21

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IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B



NOTE 1 - Raptor Nest Interactions:
NA

NOTE 2 - Direct Wetland or Ephemeral Waterbody Interactions (Class I, II, III, IV and V):
NA

NOTE 3 - Wetlands within 5 m of the Footprint (Ephemeral waterbodies, drainages, Class II and higher):
NA

NOTE 4 - Within 100 m of a Class III, IV, or V (Amphibians and Waterbirds):
Schedule construction outside of the amphibian active period (i.e., breeding period and post-breeding period to first frost, approximately April 15 to September 15). When construction within 100 m wetlands setbacks with the potential to support amphibian populations cannot be scheduled outside the amphibian active period (April 15 to September 15), a pre-construction amphibian survey will be conducted. If the pre-construction amphibian survey confirms the presence of amphibians, exclusion fencing will be installed and maintained along the nearest edge of the Project Footprint. An experienced wildlife biologist or qualified environmental monitor will conduct an amphibian salvage program, if required. Nest searches will be performed within the 100 m setback by an experienced wildlife biologist, to identify breeding birds or their nests if construction is scheduled between April 1 and August 28. If breeding activity is identified, an appropriate setback buffer will be applied.

NOTE 5 - Direct Wetland Interactions - Class IV Collector Line Crossings:
NA

GENERAL NOTE - All non cultivated areas within 100 m of construction activities:
Schedule construction outside of recommended restricted activity periods (April 1 to August 28) within all non-cultivated habitats. If construction activities occur between April 1 and August 28, non-intrusive, pre-construction nest surveys will be performed by an experienced wildlife biologist within 100 m of construction activity prior to construction. If breeding activity is identified, a minimum setback buffer of 100 m will be applied to the suspected nest location until young fledge to minimize the risk of disturbing birds, nests, or eggs. When there is potential for construction activities to pose an elevated risk to wildlife, an experienced wildlife biologist will be on site to monitor wildlife behaviour and to propose on site mitigation actions that should be implemented to reduce risk to wildlife.

GENERAL NOTE - Vegetation Clearing:
Vegetation clearing will be limited to the Project Footprint and the smallest area practicable. Where possible, short shrub species will be "walked down" or simply driven over to preserve the growth crown and root network, thereby enhancing regeneration after construction is complete. Plan vegetation clearing in all non-cultivated habitats outside of the restricted activity period (April 1 – August 28) to the extent possible (refer to General Note – all non-cultivated areas within 100 m of construction activities).

GENERAL NOTE - Clubroot and Weeds:
All vehicles and construction equipment will be clean (i.e., free of soils and vegetative debris) and disinfected (and documented) prior to arrival at the Project area and cleaned prior to leaving the Project area. All vehicles and equipment will be physically cleaned to remove soil and crop debris before traversing between fields as identified by the land agent or Environmental Monitor. Choose low traffic grassy areas near the field exit to complete cleaning when possible. Remove soil and crop debris by knocking or scraping off soil lumps and sweeping loose soil and vegetation from all equipment, vehicles, or tools used during project activities. Compressed air can be used to blow off any residue left on the machinery after scraping. A pressure washer should be used to remove soil and vegetation if the equipment was operated during wet conditions. Salvaged soil materials will not be moved between different sites. Areas that exhibit extensive weed infestations prior to disturbance will have soils salvaged and stockpiled separately to prevent the contamination of larger reclamation soil volumes.

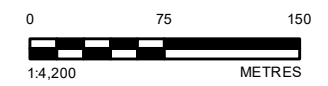
GENERAL NOTE - Turbine Foundation:
Mortality due to foundation construction activities, while not expected, may occur if wildlife falls into or becomes trapped within foundation excavations. To prevent wildlife from inadvertently falling in, open excavations or auger holes will be temporarily fenced off. Open excavations or auger holes left unsupervised will be checked daily to ensure no wildlife is trapped.

Category	Applicability	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
Raptor Nest Breeding Period	Raptor Nests and Setbacks			Wildlife Monitor Required when working in Setback									
				15-Mar				15-Jul					
Grassland Breeding Bird Nesting Period (April 1- July 15) and Migratory Bird Nesting Period, Nesting Zone B4 (April 14 - August 28)	All non cultivated areas within 100 m of construction activity.			Nest Sweep Required									
					1-Apr				28-Aug				
Amphibian Active Period (April 15 - September 15)	Direct impacts to Class III, IV and V wetlands, or work within 100 m setbacks of Class III, IV and V wetlands				Pre-Construction Amphibian Survey, Silt Fencing and Amphibian Monitoring Required as per Referral Report*		Pre-Construction Amphibian Survey, Silt Fencing and Amphibian Monitoring Recommended*						
					15-Apr	14-Jun				15-Sep			

*It is recommended that best practices for amphibian mitigation are applied during the frost-free season from about April to September 15.

REFERENCE(S)
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2. 2018 ORTHOPHOTO OBTAINED FROM TARIN RESOURCE SERVICES LTD.

PROJECTION: UTM ZONE 12 DATUM: NAD 83



CLIENT **Capital Power**

PROJECT **HALKIRK 2 WIND POWER PROJECT**

TITLE **QUARTER SECTION: NE 1-40-15 W4M**

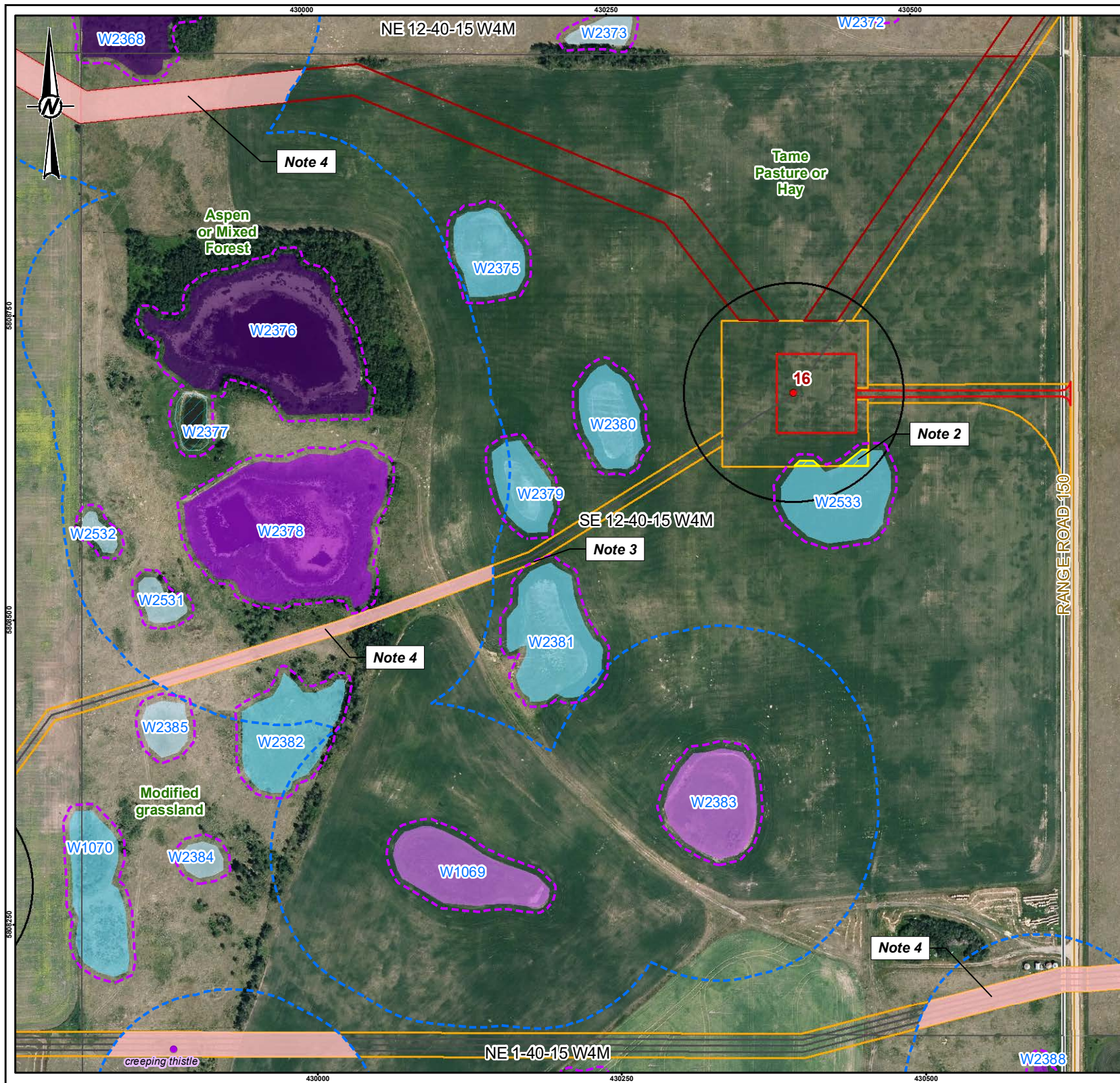
CONSULTANT **wsp**

YYYY-MM-DD	2023-09-15
DESIGNED	SC
PREPARED	LB
REVIEWED	SC
APPROVED	SC

PROJECT NO. 21452763 PHASE REV. 0 FIGURE 22

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IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B



NOTE 1 - Raptor Nest Interactions:
NA

NOTE 2 - Direct Wetland or Ephemeral Waterbody Interactions (Class I, II, III, IV and V):
Direct impacts to wetlands can not extend beyond the Project Footprint and as outlined in this plan. Wetland boundaries between the Project footprint and wetland will be marked before construction start, and silt fencing will be installed to prevent vehicle traffic from entering wetlands that extend outside of the footprint when work cannot be scheduled under dry or frozen conditions. Plan construction during dry ground conditions to the extent possible, and use rig matting, geotextiles, vegetated buffer zones, earthen berms as appropriate. Wetlands temporarily disturbed will naturally regenerate from seeds present in the soil and from adjacent areas. Plan construction outside of the sensitive amphibian breeding period or implement mitigations for amphibians when intersecting Class III, IV or V (Refer to Note 4).

NOTE 3 - Wetlands within 5 m of the Footprint (Ephemeral waterbodies, drainages, Class II and higher):
Wetlands, ephemeral water bodies and drainages within 5 m of the Project Footprint will be marked prior to construction. Silt fencing will be installed between the wetland and the nearest edge of the Project Footprint if construction cannot be scheduled during dry or frozen conditions. The Environmental Monitor may require additional silt fencing as required based on site conditions. Alternatively, the Environmental Monitor may determine silt fencing is not needed based on the distance of the wettest edge to the Project Footprint.

NOTE 4 - Within 100 m of a Class III, IV, or V (Amphibians and Waterbirds):
Schedule construction outside of the amphibian active period (i.e., breeding period and post-breeding period to first frost, approximately April 15 to September 15). When construction within 100 m wetlands setbacks with the potential to support amphibian populations cannot be scheduled outside the amphibian active period (April 15 to September 15), a pre-construction amphibian survey will be conducted. If the pre-construction amphibian survey confirms the presence of amphibians, exclusion fencing will be installed and maintained along the nearest edge of the Project Footprint. An experienced wildlife biologist or qualified environmental monitor will conduct an amphibian salvage program, if required. Nest searches will be performed within the 100 m setback by an experienced wildlife biologist, to identify breeding birds or their nests if construction is scheduled between April 1 and August 28. If breeding activity is identified, an appropriate setback buffer will be applied.

NOTE 5 - Direct Wetland Interactions - Class IV Collector Line Crossings:
NA

GENERAL NOTE - All non cultivated areas within 100 m of construction activities:
Schedule construction outside of recommended restricted activity periods (April 1 to August 28) within all non-cultivated habitats. If construction activities occur between April 1 and August 28, non-intrusive, pre-construction nest surveys will be performed an experienced wildlife biologist within 100 m of construction activity prior to construction. If breeding activity is identified, a minimum setback buffer of 100 m will be applied to the suspected nest location until young fledge to minimize the risk of disturbing birds, nests, or eggs. When there is potential for construction activities to pose an elevated risk to wildlife, an experienced wildlife biologist will be on site to monitor wildlife behaviour and to propose on site mitigation actions that should be implemented to reduce risk to wildlife.

GENERAL NOTE - Vegetation Clearing:
Vegetation clearing will be limited to the Project Footprint and the smallest area practicable. Where possible, short shrub species will be "walked down" or simply driven over to preserve the growth crown and root network, thereby enhancing regeneration after construction is complete. Plan vegetation clearing in all non-cultivated habitats outside of the restricted activity period (April 1 – August 28) to the extent possible (refer to General Note – all non-cultivated areas within 100 m of construction activities).

GENERAL NOTE - Clubroot and Weeds:
All vehicles and construction equipment will be clean (i.e., free of soils and vegetative debris) and disinfected (and documented) prior to arrival at the Project area and cleaned prior to leaving the Project area. All vehicles and equipment will be physically cleaned to remove soil and crop debris before traversing between fields as identified by the land agent or Environmental Monitor. Choose low traffic grassy areas near the field exit to complete cleaning when possible. Remove soil and crop debris by knocking or scraping off soil lumps and sweeping loose soil and vegetation from all equipment, vehicles, or tools used during project activities. Compressed air can be used to blow off any residue left on the machinery after scraping. A pressure washer should be used to remove soil and vegetation if the equipment was operated during wet conditions. Salvaged soil materials will not be moved between different sites. Areas that exhibit extensive weed infestations prior to disturbance will have soils salvaged and stockpiled separately to prevent the contamination of larger reclamation soil volumes.

GENERAL NOTE - Turbine Foundation:
Mortality due to foundation construction activities, while not expected, may occur if wildlife falls into or becomes trapped within foundation excavations. To prevent wildlife from inadvertently falling in, open excavations or auger holes will be temporarily fenced off. Open excavations or auger holes left unsupervised will be checked daily to ensure no wildlife is trapped.

Category	Applicability	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
Raptor Nest Breeding Period	Raptor Nests and Setbacks			Wildlife Monitor Required when working in Setback									
				15-Mar				15-Jul					
Grassland Breeding Bird Nesting Period (April 1- July 15) and Migratory Bird Nesting Period, Nesting Zone B4 (April 14 - August 28)	All non cultivated areas within 100 m of construction activity.			Nest Sweep Required									
					1-Apr				28-Aug				
Amphibian Active Period (April 15 - September 15)	Direct impacts to Class III, IV and V wetlands, or work within 100 m setbacks of Class III, IV and V wetlands				Pre-Construction Amphibian Survey, Silt Fencing and Amphibian Monitoring Required as per Referral Report*		Pre-Construction Amphibian Survey, Silt Fencing and Amphibian Monitoring Recommended*						
					15-Apr		14-Jun			15-Sep			

*It is recommended that best practices for amphibian mitigation are applied during the frost-free season from about April to September 15.

LEGEND

- CADASTRAL
- LOCAL ROAD
- PROJECT LAYOUT
 - TURBINE
 - ROTOR-SWEPT AREA
 - UNDERGROUND COLLECTOR SYSTEM
 - CRANE PATH
 - OPERATION FOOTPRINT
 - CONSTRUCTION FOOTPRINT

ENVIRONMENTAL CONSTRAINTS

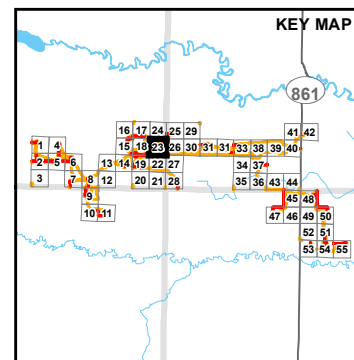
- AREA OF FOOTPRINT INTERACTION/MITIGATION (SEE NOTES)
- WETLAND SETBACK (5 m) INTERACTION (Silt fencing between the Project Footprint and wetland when work cannot be scheduled during dry or frozen periods.)
- WETLAND (CLASS III+) SETBACK (100 m) INTERACTION

WETLAND AND WATER BODY PERMANENCE

- EPHEMERAL (CLASS I) WATER BODY
- TEMPORARY (CLASS II) WETLAND
- SEASONAL (CLASS III) WETLAND
- SEMI-PERMANENT (CLASS IV) WETLAND
- PERMANENT (CLASS V) WETLAND
- ANTHROPOGENIC WATER BODY/MODIFIED NATURAL WETLAND
- WETLAND (CLASS III+) SETBACK (100 m)
- WETLAND SETBACK (5 m)

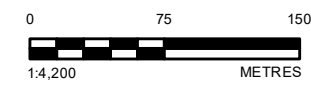
WEED OBSERVATION

- NOXIOUS WEED SPECIES OBSERVATION



REFERENCE(S)
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2. 2018 ORTHOPHOTO OBTAINED FROM TARIN RESOURCE SERVICES LTD.

PROJECTION: UTM ZONE 12 DATUM: NAD 83



CLIENT **Capital Power**

PROJECT **HALKIRK 2 WIND POWER PROJECT**

TITLE **QUARTER SECTION: SE 12-40-15 W4M**

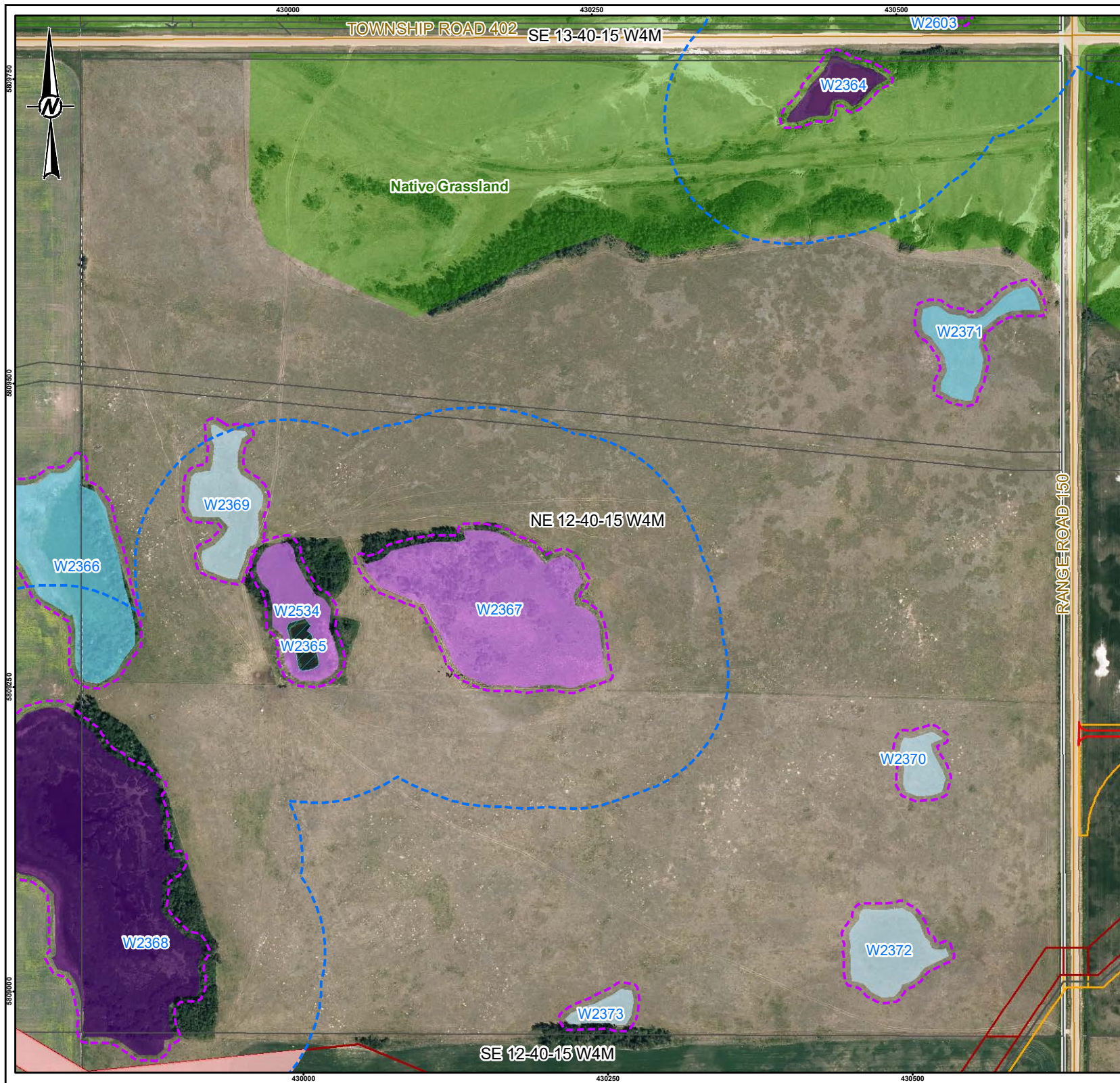
CONSULTANT **wsp**

DESIGNED	SC
PREPARED	LB
REVIEWED	SC
APPROVED	SC

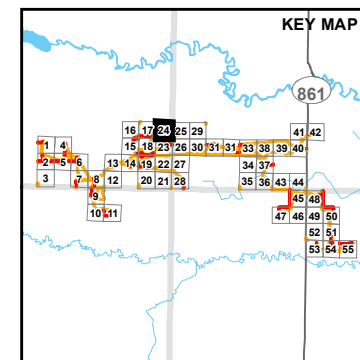
PROJECT NO. 21452763 PHASE REV. 0 FIGURE 23

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LEGEND		ENVIRONMENTAL CONSTRAINTS		WETLAND AND WATER BODY PERMANENCE	
	CADASTRAL		AREA OF FOOTPRINT INTERACTION/MITIGATION (SEE NOTES)		EPHEMERAL (CLASS I) WATER BODY
	LOCAL ROAD		WETLAND (CLASS III+) SETBACK (100 m) INTERACTION		TEMPORARY (CLASS II) WETLAND
	NATIVE GRASSLAND				SEASONAL (CLASS III) WETLAND
	UNDERGROUND COLLECTOR SYSTEM				SEMI-PERMANENT (CLASS IV) WETLAND
	CRANE PATH				PERMANENT (CLASS V) WETLAND
	OPERATION FOOTPRINT				ANTHROPOGENIC WATER BODY/MODIFIED NATURAL WETLAND
	CONSTRUCTION FOOTPRINT				WETLAND (CLASS III+) SETBACK (100 m)
					WETLAND SETBACK (5 m)



NOTE 1 - Raptor Nest Interactions:

NA

NOTE 2 - Direct Wetland or Ephemeral Waterbody Interactions (Class I, II, III, IV and V):

NA

NOTE 3 - Wetlands within 5 m of the Footprint (Ephemeral waterbodies, drainages, Class II and higher):

NA

NOTE 4 - Within 100 m of a Class III, IV, or V (Amphibians and Waterbirds):

NA

NOTE 5 - Direct Wetland Interactions - Class IV Collector Line Crossings:

NA

GENERAL NOTE - All non cultivated areas within 100 m of construction activities:

Schedule construction outside of recommended restricted activity periods (April 1 to August 28) within all non-cultivated habitats. If construction activities occur between April 1 and August 28, non-intrusive, pre-construction nest surveys will be performed by an experienced wildlife biologist within 100 m of construction activity prior to construction. If breeding activity is identified, a minimum setback buffer of 100 m will be applied to the suspected nest location until young fledge to minimize the risk of disturbing birds, nests, or eggs. When there is potential for construction activities to pose an elevated risk to wildlife, an experienced wildlife biologist will be on site to monitor wildlife behaviour and to propose on site mitigation actions that should be implemented to reduce risk to wildlife.

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GENERAL NOTE - Clubroot and Weeds:

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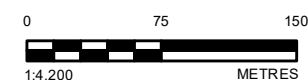
Category	Applicability	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
Raptor Nest Breeding Period	Raptor Nests and Setbacks			Wildlife Monitor Required when working in Setback									
				15-Mar				15-Jul					
Grassland Breeding Bird Nesting Period (April 1- July 15) and Migratory Bird Nesting Period, Nesting Zone B4 (April 14 - August 28)	All non cultivated areas within 100 m of construction activity.			Nest Sweep Required									
					1-Apr				28-Aug				
Amphibian Active Period (April 15 - September 15)	Direct impacts to Class III, IV and V wetlands, or work within 100 m setbacks of Class III, IV and V wetlands				Pre-Construction Amphibian Survey, Silt Fencing and Amphibian Monitoring Required as per Referral Report*		Pre-Construction Amphibian Survey, Silt Fencing and Amphibian Monitoring Recommended*						
					15-Apr	14-Jun				15-Sep			

*It is recommended that best practices for amphibian mitigation are applied during the frost-free season from about April to September 15.

REFERENCE(S)

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2. 2018 ORTHOPHOTO OBTAINED FROM TARIN RESOURCE SERVICES LTD.

PROJECTION: UTM ZONE 12 DATUM: NAD 83



CLIENT **Capital Power**

PROJECT **HALKIRK 2 WIND POWER PROJECT**

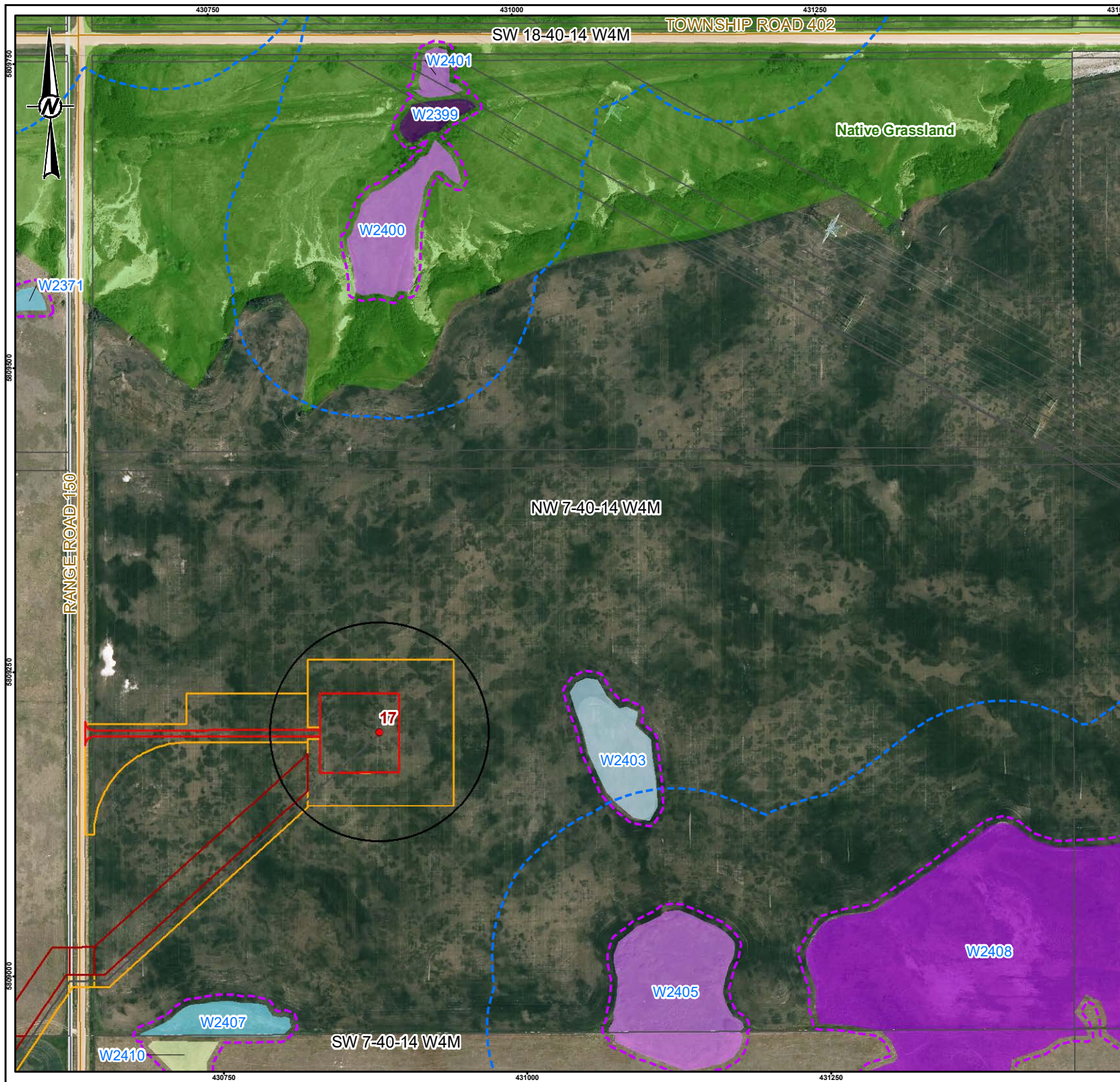
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	DESIGNED	SC
	PREPARED	LB
	REVIEWED	SC
	APPROVED	SC

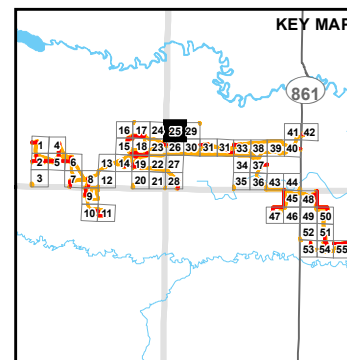
PROJECT NO. 21452763 PHASE REV. 0 FIGURE 24

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IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B



- LEGEND**
- CADASTRAL
 - LOCAL ROAD
 - NATIVE GRASSLAND
 - PROJECT LAYOUT**
 - TURBINE
 - ROTOR-SWEPT AREA
 - UNDERGROUND COLLECTOR SYSTEM
 - CRANE PATH
 - OPERATION FOOTPRINT
 - CONSTRUCTION FOOTPRINT
- ENVIRONMENTAL CONSTRAINTS**
- AREA OF FOOTPRINT INTERACTION/MITIGATION (SEE NOTES)
- WETLAND AND WATER BODY PERMANENCE**
- EPHEMERAL (CLASS I) WATER BODY
 - TEMPORARY (CLASS II) WETLAND
 - SEASONAL (CLASS III) WETLAND
 - SEMI-PERMANENT (CLASS IV) WETLAND
 - PERMANENT (CLASS V) WETLAND
 - NATURAL DRAINAGE
 - WETLAND (CLASS III+) SETBACK (100 m)
 - WETLAND SETBACK (5 m)



NOTE 1 - Raptor Nest Interactions:

NA

NOTE 2 - Direct Wetland or Ephemeral Waterbody Interactions (Class I, II, III, IV and V):

NA

NOTE 3 - Wetlands within 5 m of the Footprint (Ephemeral waterbodies, drainages, Class II and higher):

NA

NOTE 4 - Within 100 m of a Class III, IV, or V (Amphibians and Waterbirds):

NA

NOTE 5 - Direct Wetland Interactions - Class IV Collector Line Crossings:

NA

GENERAL NOTE - All non cultivated areas within 100 m of construction activities:

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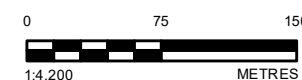
Category	Applicability	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
Raptor Nest Breeding Period	Raptor Nests and Setbacks			Wildlife Monitor Required when working in Setback 15-Mar				15-Jul					
Grassland Breeding Bird Nesting Period (April 1- July 15) and Migratory Bird Nesting Period, Nesting Zone B4 (April 14 - August 28)	All non cultivated areas within 100 m of construction activity.				Nest Sweep Required								
Amphibian Active Period (April 15 - September 15)	Direct impacts to Class III, IV and V wetlands, or work within 100 m setbacks of Class III, IV and V wetlands				1-Apr Pre-Construction Amphibian Survey, Silt Fencing and Amphibian Monitoring Required as per Referral Report*			28-Aug Pre-Construction Amphibian Survey, Silt Fencing and Amphibian Monitoring Recommended*					
					15-Apr		14-Jun			15-Sep			

*It is recommended that best practices for amphibian mitigation are applied during the frost-free season from about April to September 15.

REFERENCE(S)

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2. 2018 ORTHOPHOTO OBTAINED FROM TARIN RESOURCE SERVICES LTD.

PROJECTION: UTM ZONE 12 DATUM: NAD 83



CLIENT
Capital Power

PROJECT
HALKIRK 2 WIND POWER PROJECT

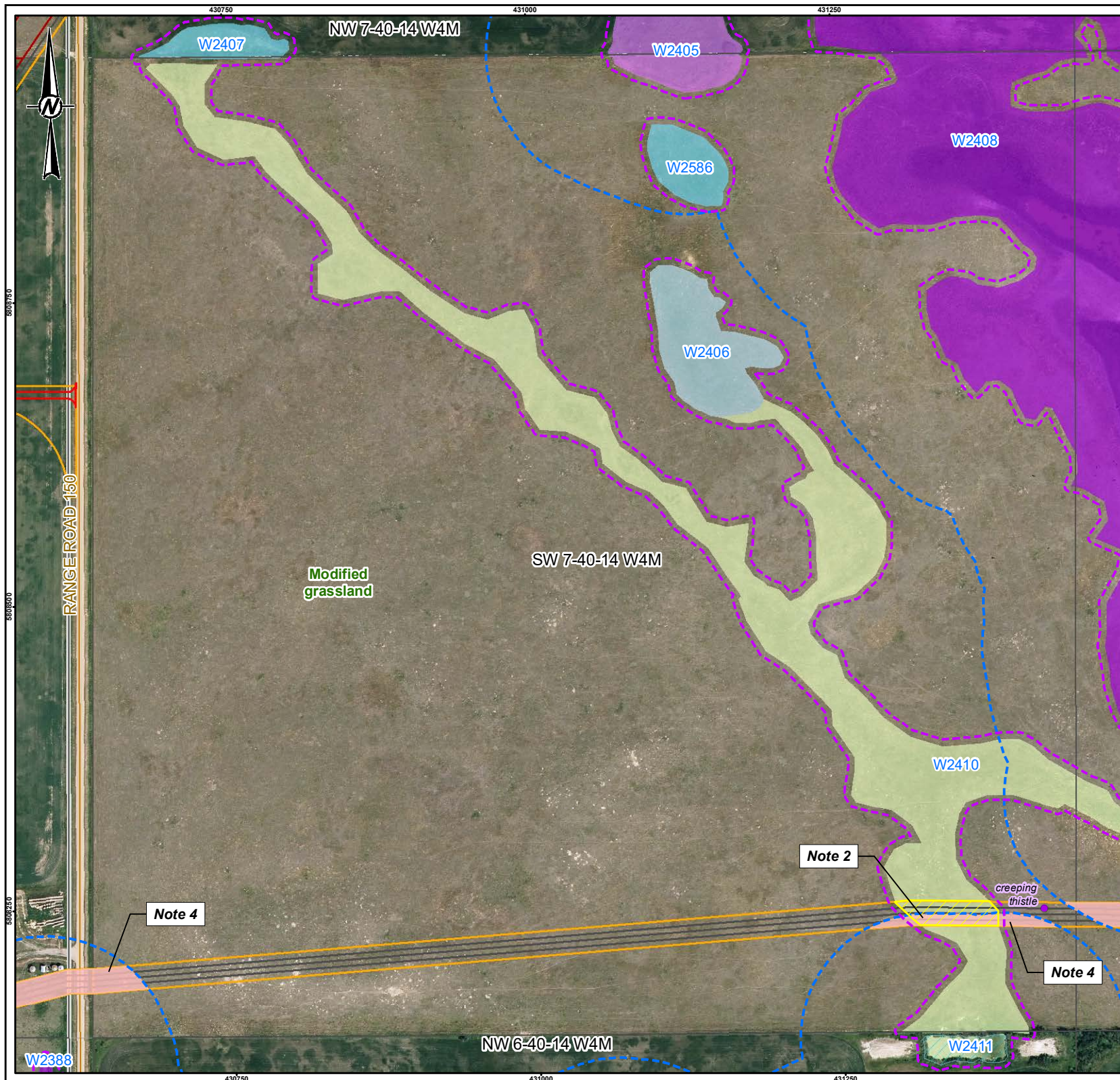
TITLE
QUARTER SECTION: NW 7-40-14 W4M

CONSULTANT	YYYY-MM-DD	2023-09-15
DESIGNED	SC	
PREPARED	LB	
REVIEWED	SC	
APPROVED	SC	

PROJECT NO. 21452763 PHASE REV. 0 FIGURE 25

PATH: I:\CLIENT\CAPITAL_POWER\21452763\Mapping\Production\General\Environmental_Protection_Plan_QuarterSection_Environmental_Printed_ON_20230915_15:31:38.PM

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B



NOTE 1 - Raptor Nest Interactions:

NA

NOTE 2 - Direct Wetland or Ephemeral Waterbody Interactions (Class I, II, III, IV and V):

Direct impacts to wetlands can not extend beyond the Project Footprint and as outlined in this plan. Wetland boundaries between the Project footprint and wetland will be marked before construction start, and silt fencing will be installed to prevent vehicle traffic from entering wetlands that extend outside of the footprint when work cannot be scheduled under dry or frozen conditions. Plan construction during dry ground conditions to the extent possible, and use rig matting, geotextiles, vegetated buffer zones, earthen berms as appropriate. Wetlands temporarily disturbed will naturally regenerate from seeds present in the soil and from adjacent areas. Plan construction outside of the sensitive amphibian breeding period or implement mitigations for amphibians when intersecting Class III, IV or V (Refer to Note 4).

NOTE 3 - Wetlands within 5 m of the Footprint (Ephemeral waterbodies, drainages, Class II and higher):

NA

NOTE 4 - Within 100 m of a Class III, IV, or V (Amphibians and Waterbirds):

Schedule construction outside of the amphibian active period (i.e., breeding period and post-breeding period to first frost, approximately April 15 to September 15). When construction within 100 m wetlands setbacks with the potential to support amphibian populations cannot be scheduled outside the amphibian active period (April 15 to September 15), a pre-construction amphibian survey will be conducted. If the pre-construction amphibian survey confirms the presence of amphibians, exclusion fencing will be installed and maintained along the nearest edge of the Project Footprint. An experienced wildlife biologist or qualified environmental monitor will conduct an amphibian salvage program, if required. Nest searches will be performed within the 100 m setback by an experienced wildlife biologist, to identify breeding birds or their nests if construction is scheduled between April 1 and August 28. If breeding activity is identified, an appropriate setback buffer will be applied.

NOTE 5 - Direct Wetland Interactions - Class IV Collector Line Crossings:

NA

GENERAL NOTE - All non cultivated areas within 100 m of construction activities:

Schedule construction outside of recommended restricted activity periods (April 1 to August 28) within all non-cultivated habitats. If construction activities occur between April 1 and August 28, non-intrusive, pre-construction nest surveys will be performed an experienced wildlife biologist within 100 m of construction activity prior to construction. If breeding activity is identified, a minimum setback buffer of 100 m will be applied to the suspected nest location until young fledge to minimize the risk of disturbing birds, nests, or eggs. When there is potential for construction activities to pose an elevated risk to wildlife, an experienced wildlife biologist will be on site to monitor wildlife behaviour and to propose on site mitigation actions that should be implemented to reduce risk to wildlife.

GENERAL NOTE - Vegetation Clearing:

Vegetation clearing will be limited to the Project Footprint and the smallest area practicable. Where possible, short shrub species will be "walked down" or simply driven over to preserve the growth crown and root network, thereby enhancing regeneration after construction is complete. Plan vegetation clearing in all non-cultivated habitats outside of the restricted activity period (April 1 – August 28) to the extent possible (refer to General Note – all non-cultivated areas within 100 m of construction activities).

GENERAL NOTE - Clubroot and Weeds:

All vehicles and construction equipment will be clean (i.e., free of soils and vegetative debris) and disinfected (and documented) prior to arrival at the Project area and cleaned prior to leaving the Project area. All vehicles and equipment will be physically cleaned to remove soil and crop debris before traversing between fields as identified by the land agent or Environmental Monitor. Choose low traffic grassy areas near the field exit to complete cleaning when possible. Remove soil and crop debris by knocking or scraping off soil lumps and sweeping loose soil and vegetation from all equipment, vehicles, or tools used during project activities. Compressed air can be used to blow off any residue left on the machinery after scraping. A pressure washer should be used to remove soil and vegetation if the equipment was operated during wet conditions. Salvaged soil materials will not be moved between different sites. Areas that exhibit extensive weed infestations prior to disturbance will have soils salvaged and stockpiled separately to prevent the contamination of larger reclamation soil volumes.

GENERAL NOTE - Turbine Foundation:

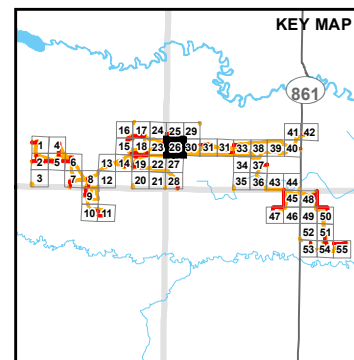
Mortality due to foundation construction activities, while not expected, may occur if wildlife falls into or becomes trapped within foundation excavations. To prevent wildlife from inadvertently falling in, open excavations or auger holes will be temporarily fenced off. Open excavations or auger holes left unsupervised will be checked daily to ensure no wildlife is trapped.

Category	Applicability	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
Raptor Nest Breeding Period	Raptor Nests and Setbacks			Wildlife Monitor Required when working in Setback									
				15-Mar				15-Jul					
Grassland Breeding Bird Nesting Period (April 1- July 15) and Migratory Bird Nesting Period, Nesting Zone B4 (April 14 - August 28)	All non cultivated areas within 100 m of construction activity.			Nest Sweep Required									
					1-Apr				28-Aug				
Amphibian Active Period (April 15 - September 15)	Direct impacts to Class III, IV and V wetlands, or work within 100 m setbacks of Class III, IV and V wetlands				Pre-Construction Amphibian Survey, Silt Fencing and Amphibian Monitoring Required as per Referral Report*		Pre-Construction Amphibian Survey, Silt Fencing and Amphibian Monitoring Recommended*						
					15-Apr		14-Jun			15-Sep			

*It is recommended that best practices for amphibian mitigation are applied during the frost-free season from about April to September 15.

LEGEND

- CADASTRAL
 - LOCAL ROAD
 - UNDERGROUND COLLECTOR SYSTEM
 - CRANE PATH
 - OPERATION FOOTPRINT
 - CONSTRUCTION FOOTPRINT
- ENVIRONMENTAL CONSTRAINTS**
 - AREA OF FOOTPRINT INTERACTION/MITIGATION (SEE NOTES)
 - WETLAND (CLASS III+) SETBACK (100 m) INTERACTION
- WETLAND AND WATER BODY PERMANENCE**
 - EPHEMERAL (CLASS I) WATER BODY
 - TEMPORARY (CLASS II) WETLAND
 - SEASONAL (CLASS III) WETLAND
 - SEMI-PERMANENT (CLASS IV) WETLAND
 - ANTHROPOGENIC WATER BODY/MODIFIED NATURAL WETLAND
 - NATURAL DRAINAGE
 - WETLAND (CLASS III+) SETBACK (100 m)
 - WETLAND SETBACK (5 m)
- WEED OBSERVATION**
 - NOXIOUS WEED SPECIES OBSERVATION



REFERENCE(S)

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- 2018 ORTHOPHOTO OBTAINED FROM TARIN RESOURCE SERVICES LTD.

PROJECTION: UTM ZONE 12 DATUM: NAD 83



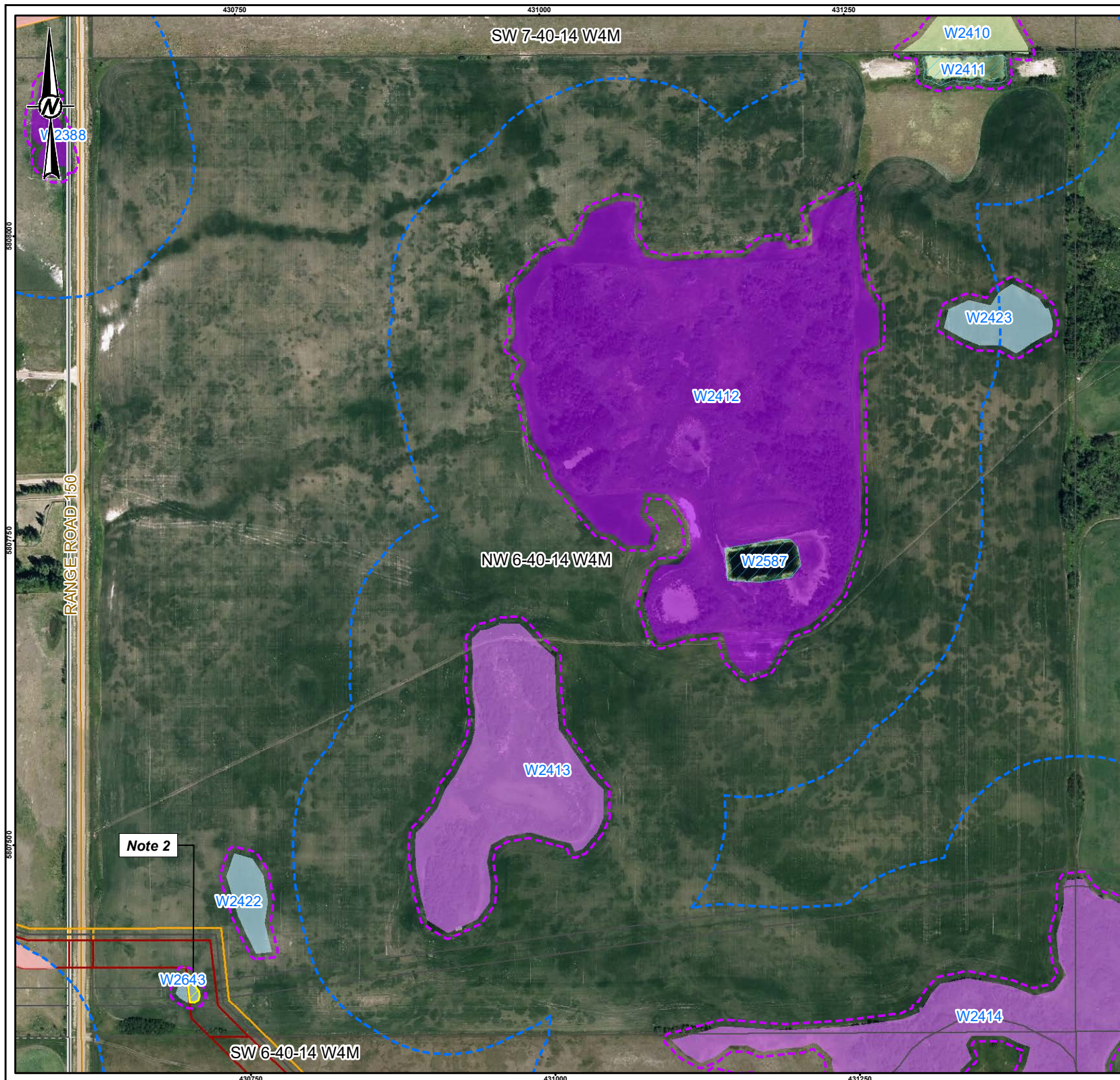
CLIENT
HALKIRK 2 WIND POWER PROJECT

TITLE
QUARTER SECTION: SW 7-40-14 W4M

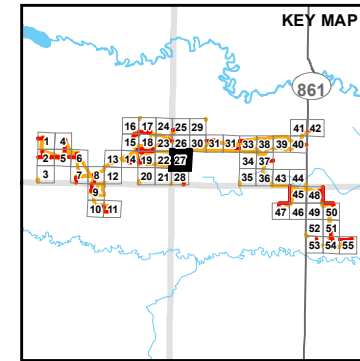
CONSULTANT	YYYY-MM-DD	2023-09-15
DESIGNED	SC	
PREPARED	LB	
REVIEWED	SC	
APPROVED	SC	

PROJECT NO. 21452763 PHASE REV. 0 FIGURE 26





LEGEND		ENVIRONMENTAL CONSTRAINTS		WETLAND AND WATER BODY PERMANENCE	
	CADASTRAL		AREA OF FOOTPRINT INTERACTION/MITIGATION (SEE NOTES)		EPHEMERAL (CLASS I) WATER BODY
	LOCAL ROAD		WETLAND SETBACK (5 m) INTERACTION (Silt fencing between the Project Footprint and wetland when work cannot be scheduled during dry or frozen periods.)		SEASONAL (CLASS III) WETLAND
	UNDERGROUND COLLECTOR SYSTEM		WETLAND (CLASS III+) SETBACK (100 m) INTERACTION		SEMI-PERMANENT (CLASS IV) WETLAND
	CRANE PATH				ANTHROPOGENIC WATER BODY/MODIFIED NATURAL WETLAND
	CONSTRUCTION FOOTPRINT				NATURAL DRAINAGE
					WETLAND (CLASS III+) SETBACK (100 m)
					WETLAND SETBACK (5 m)



NOTE 1 - Raptor Nest Interactions:
NA

NOTE 2 - Direct Wetland or Ephemeral Waterbody Interactions (Class I, II, III, IV and V):
Direct impacts to wetlands can not extend beyond the Project Footprint and as outlined in this plan. Wetland boundaries between the Project footprint and wetland will be marked before construction start, and silt fencing will be installed to prevent vehicle traffic from entering wetlands that extend outside of the footprint when work cannot be scheduled under dry or frozen conditions. Plan construction during dry ground conditions to the extent possible, and use rig matting, geotextiles, vegetated buffer zones, earthen berms as appropriate. Wetlands temporarily disturbed will naturally regenerate from seeds present in the soil and from adjacent areas. Plan construction outside of the sensitive amphibian breeding period or implement mitigations for amphibians when intersecting Class III, IV or V (Refer to Note 4).

NOTE 3 - Wetlands within 5 m of the Footprint (Ephemeral waterbodies, drainages, Class II and higher):
Wetlands, ephemeral water bodies and drainages within 5 m of the Project Footprint will be marked prior to construction. Silt fencing will be installed between the wetland and the nearest edge of the Project Footprint if construction cannot be scheduled during dry or frozen conditions. The Environmental Monitor may require additional silt fencing as required based on site conditions. Alternatively, the Environmental Monitor may determine silt fencing is not needed based on the distance of the wettest edge to the Project Footprint.

NOTE 4 - Within 100 m of a Class III, IV, or V (Amphibians and Waterbirds):
NA

NOTE 5 - Direct Wetland Interactions - Class IV Collector Line Crossings:
NA

GENERAL NOTE - All non cultivated areas within 100 m of construction activities:
Schedule construction outside of recommended restricted activity periods (April 1 to August 28) within all non-cultivated habitats. If construction activities occur between April 1 and August 28, non-intrusive, pre-construction nest surveys will be performed an experienced wildlife biologist within 100 m of construction activity prior to construction. If breeding activity is identified, a minimum setback buffer of 100 m will be applied to the suspected nest location until young fledge to minimize the risk of disturbing birds, nests, or eggs. When there is potential for construction activities to pose an elevated risk to wildlife, an experienced wildlife biologist will be on site to monitor wildlife behaviour and to propose on site mitigation actions that should be implemented to reduce risk to wildlife.

GENERAL NOTE - Vegetation Clearing:
Vegetation clearing will be limited to the Project Footprint and the smallest area practicable. Where possible, short shrub species will be "walked down" or simply driven over to preserve the growth crown and root network, thereby enhancing regeneration after construction is complete. Plan vegetation clearing in all non-cultivated habitats outside of the restricted activity period (April 1 – August 28) to the extent possible (refer to General Note – all non-cultivated areas within 100 m of construction activities).

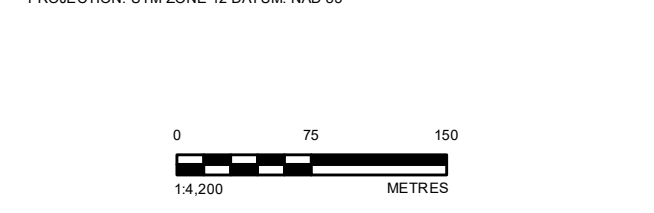
GENERAL NOTE - Clubroot and Weeds:
All vehicles and construction equipment will be clean (i.e., free of soils and vegetative debris) and disinfected (and documented) prior to arrival at the Project area and cleaned prior to leaving the Project area. All vehicles and equipment will be physically cleaned to remove soil and crop debris before traversing between fields as identified by the land agent or Environmental Monitor. Choose low traffic grassy areas near the field exit to complete cleaning when possible. Remove soil and crop debris by knocking or scraping off soil lumps and sweeping loose soil and vegetation from all equipment, vehicles, or tools used during project activities. Compressed air can be used to blow off any residue left on the machinery after scraping. A pressure washer should be used to remove soil and vegetation if the equipment was operated during wet conditions. Salvaged soil materials will not be moved between different sites. Areas that exhibit extensive weed infestations prior to disturbance will have soils salvaged and stockpiled separately to prevent the contamination of larger reclamation soil volumes.

GENERAL NOTE - Turbine Foundation:
Mortality due to foundation construction activities, while not expected, may occur if wildlife falls into or becomes trapped within foundation excavations. To prevent wildlife from inadvertently falling in, open excavations or auger holes will be temporarily fenced off. Open excavations or auger holes left unsupervised will be checked daily to ensure no wildlife is trapped.

Category	Applicability	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
Raptor Nest Breeding Period	Raptor Nests and Setbacks			Wildlife Monitor Required when working in Setback									
				15-Mar				15-Jul					
Grassland Breeding Bird Nesting Period (April 1- July 15) and Migratory Bird Nesting Period, Nesting Zone B4 (April 14 - August 28)	All non cultivated areas within 100 m of construction activity.			Nest Sweep Required									
					1-Apr				28-Aug				
Amphibian Active Period (April 15 - September 15)	Direct impacts to Class III, IV and V wetlands, or work within 100 m setbacks of Class III, IV and V wetlands				Pre-Construction Amphibian Survey, Silt Fencing and Amphibian Monitoring Required as per Referral Report*			Pre-Construction Amphibian Survey, Silt Fencing and Amphibian Monitoring Recommended*					
					15-Apr		14-Jun			15-Sep			

*It is recommended that best practices for amphibian mitigation are applied during the frost-free season from about April to September 15.

REFERENCE(S)
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CLIENT **Capital Power**

PROJECT **HALKIRK 2 WIND POWER PROJECT**

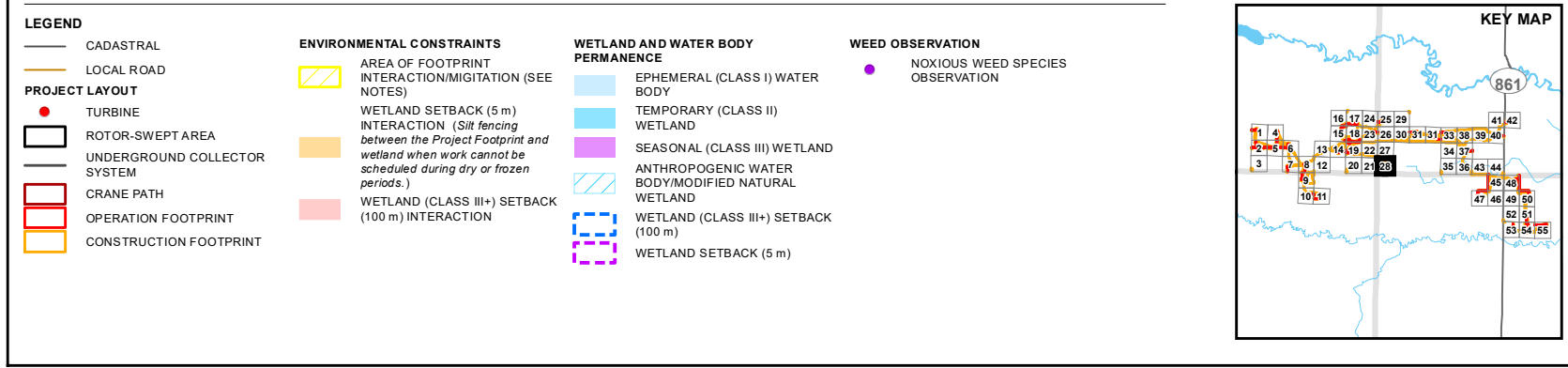
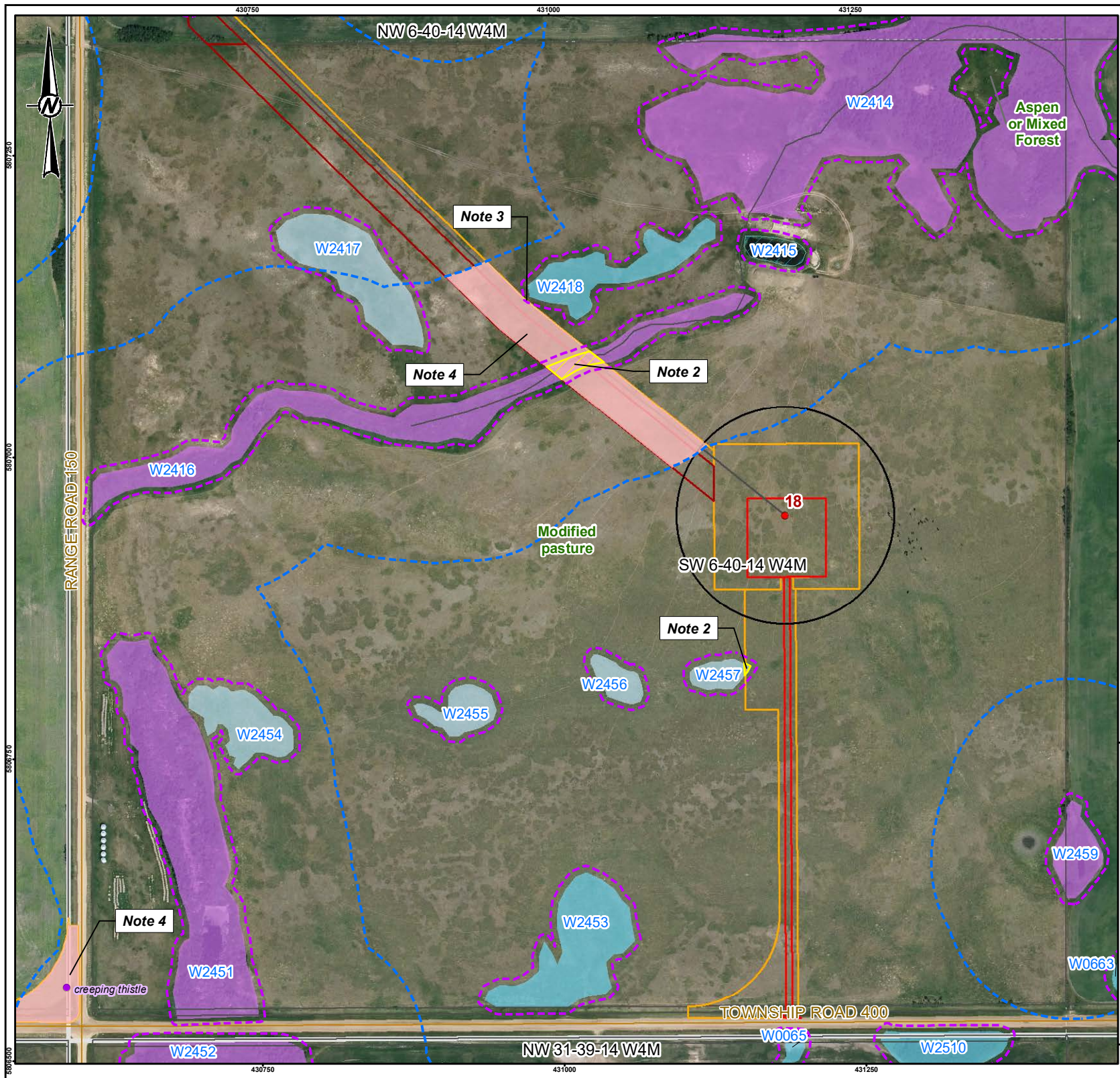
TITLE **QUARTER SECTION: NW 6-40-14 W4M**

CONSULTANT **wsp**

PROJECT NO.	PHASE	REV.	FIGURE
21452763		0	27

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IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B



NOTE 1 - Raptor Nest Interactions:
NA

NOTE 2 - Direct Wetland or Ephemeral Waterbody Interactions (Class I, II, III, IV and V):
Direct impacts to wetlands can not extend beyond the Project Footprint and as outlined in this plan. Wetland boundaries between the Project footprint and wetland will be marked before construction start, and silt fencing will be installed to prevent vehicle traffic from entering wetlands that extend outside of the footprint when work cannot be scheduled under dry or frozen conditions. Plan construction during dry ground conditions to the extent possible, and use rig matting, geotextiles, vegetated buffer zones, earthen berms as appropriate. Wetlands temporarily disturbed will naturally regenerate from seeds present in the soil and from adjacent areas. Plan construction outside of the sensitive amphibian breeding period or implement mitigations for amphibians when intersecting Class III, IV or V (Refer to Note 4).

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NOTE 4 - Within 100 m of a Class III, IV, or V (Amphibians and Waterbirds):
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NOTE 5 - Direct Wetland Interactions - Class IV Collector Line Crossings:
NA

GENERAL NOTE - All non cultivated areas within 100 m of construction activities:
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GENERAL NOTE - Vegetation Clearing:
Vegetation clearing will be limited to the Project Footprint and the smallest area practicable. Where possible, short shrub species will be "walked down" or simply driven over to preserve the growth crown and root network, thereby enhancing regeneration after construction is complete. Plan vegetation clearing in all non-cultivated habitats outside of the restricted activity period (April 1 – August 28) to the extent possible (refer to General Note – all non-cultivated areas within 100 m of construction activities).

GENERAL NOTE - Clubroot and Weeds:
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Amphibian Active Period (April 15 - September 15)	Direct impacts to Class III, IV and V wetlands, or work within 100 m setbacks of Class III, IV and V wetlands				1-Apr Pre-Construction Amphibian Survey, Silt Fencing and Amphibian Monitoring Required as per Referral Report*			28-Aug Pre-Construction Amphibian Survey, Silt Fencing and Amphibian Monitoring Recommended*					
					15-Apr		14-Jun			15-Sep			

*It is recommended that best practices for amphibian mitigation are applied during the frost-free season from about April to September 15.

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2. 2018 ORTHOPHOTO OBTAINED FROM TARIN RESOURCE SERVICES LTD.

PROJECTION: UTM ZONE 12 DATUM: NAD 83

CLIENT **Capital Power**

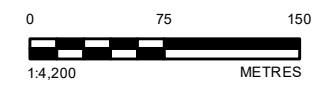
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TITLE **QUARTER SECTION: SW 6-40-14 W4M**

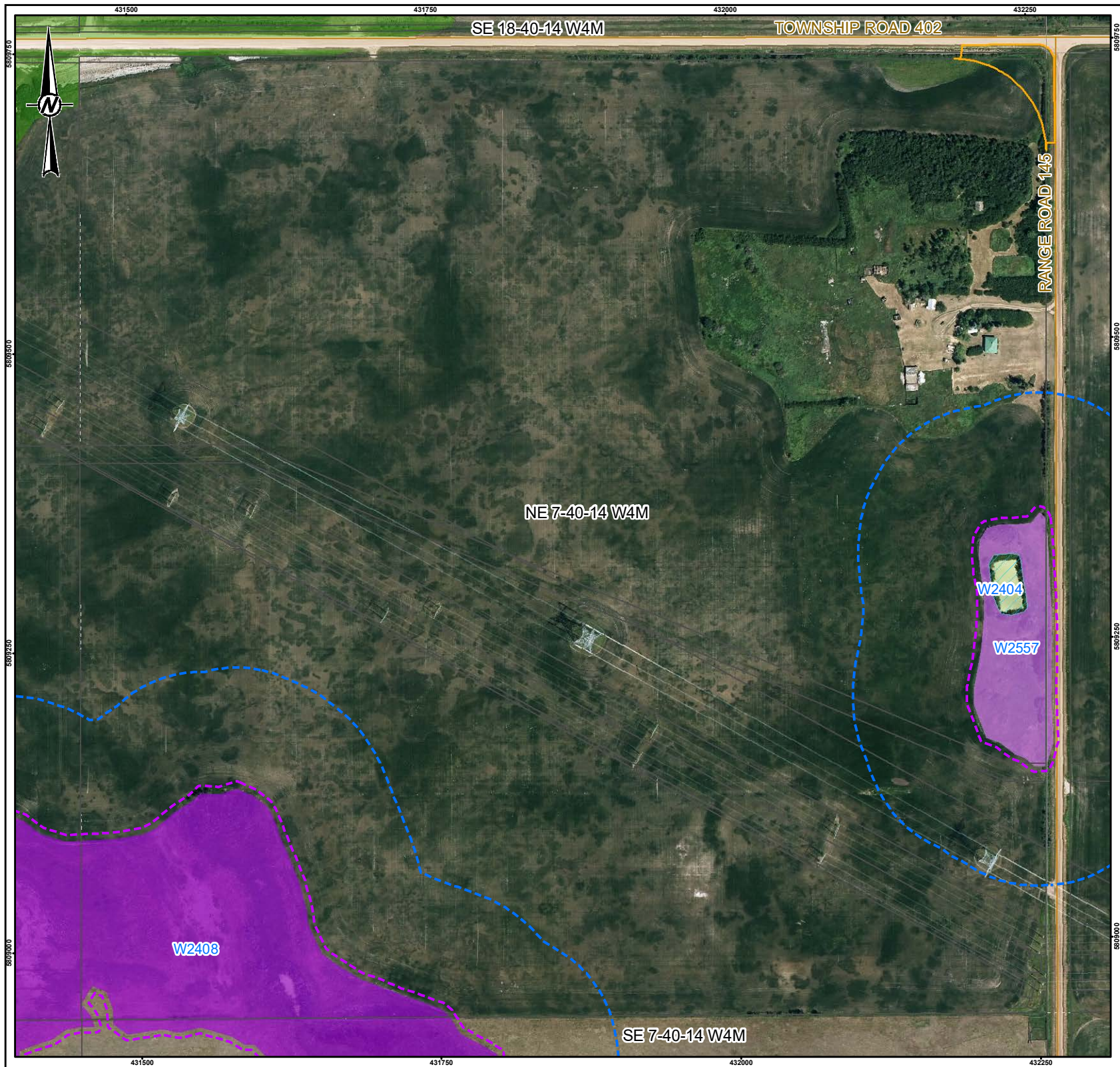
CONSULTANT

YYYY-MM-DD	2023-09-15
DESIGNED	SC
PREPARED	LB
REVIEWED	SC
APPROVED	SC

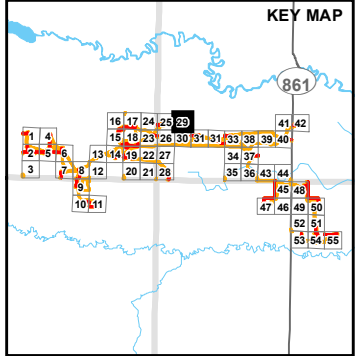
PROJECT NO. 21452763 PHASE REV. 0 FIGURE 28



IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B



- LEGEND**
- CADASTRAL
 - LOCAL ROAD
 - NATIVE GRASSLAND
 - CONSTRUCTION FOOTPRINT
- ENVIRONMENTAL CONSTRAINTS**
- AREA OF FOOTPRINT INTERACTION/MITIGATION (SEE NOTES)
- WETLAND AND WATER BODY PERMANENCE**
- SEASONAL (CLASS III) WETLAND
 - SEMI-PERMANENT (CLASS IV) WETLAND
 - ANTHROPOGENIC WATER BODY/MODIFIED NATURAL WETLAND
 - WETLAND (CLASS III+) SETBACK (100 m)
 - WETLAND SETBACK (5 m)



- NOTE 1 - Raptor Nest Interactions:**
NA
- NOTE 2 - Direct Wetland or Ephemeral Waterbody Interactions (Class I, II, III, IV and V):**
NA
- NOTE 3 - Wetlands within 5 m of the Footprint (Ephemeral waterbodies, drainages, Class II and higher):**
NA
- NOTE 4 - Within 100 m of a Class III, IV, or V (Amphibians and Waterbirds):**
NA
- NOTE 5 - Direct Wetland Interactions - Class IV Collector Line Crossings:**
NA

GENERAL NOTE - All non cultivated areas within 100 m of construction activities:
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Amphibian Active Period (April 15 - September 15)	Direct impacts to Class III, IV and V wetlands, or work within 100 m setbacks of Class III, IV and V wetlands				1-Apr Pre-Construction Amphibian Survey, Silt Fencing and Amphibian Monitoring Required as per Referral Report*				28-Aug Pre-Construction Amphibian Survey, Silt Fencing and Amphibian Monitoring Recommended*				
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2. 2018 ORTHOPHOTO OBTAINED FROM TARIN RESOURCE SERVICES LTD.

PROJECTION: UTM ZONE 12 DATUM: NAD 83

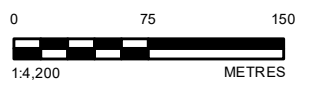
CLIENT **Capital Power**

PROJECT **HALKIRK 2 WIND POWER PROJECT**

TITLE **QUARTER SECTION: NE 7-40-14 W4M**

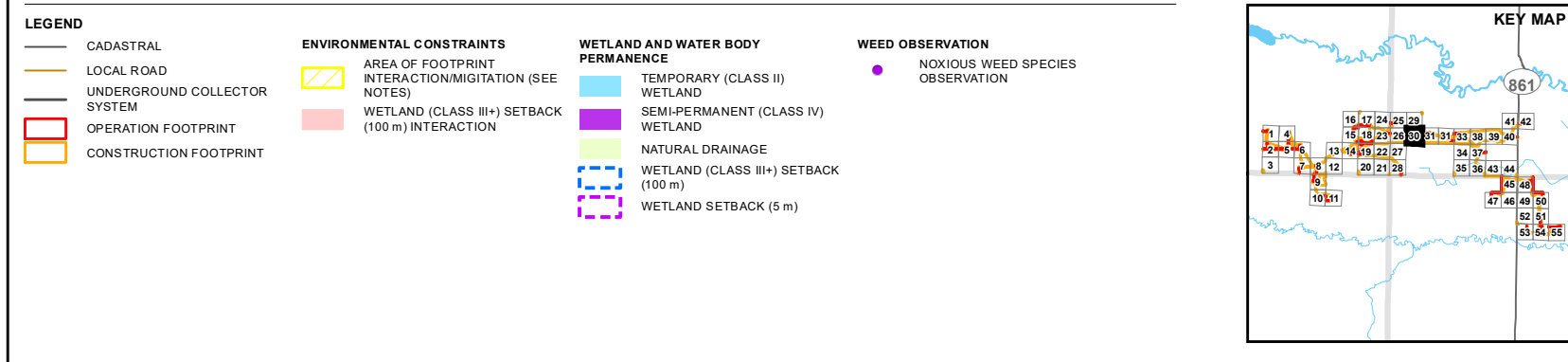
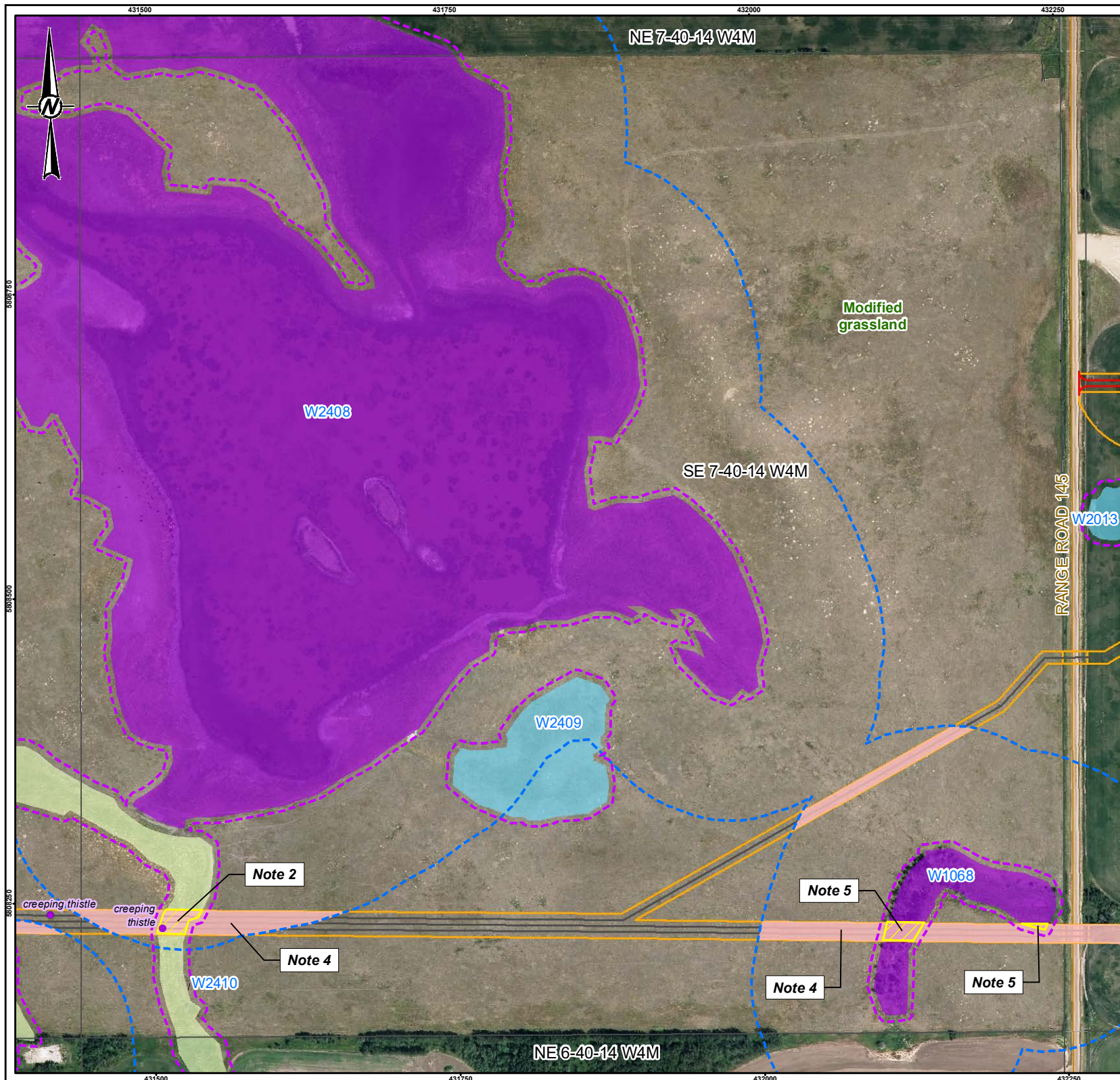
CONSULTANT

YYYY-MM-DD	2023-09-15
DESIGNED	SC
PREPARED	LB
REVIEWED	SC
APPROVED	SC



PATH: I:\CLIENT\CAPITAL_POWER\21452763\Mapping\Production\General\Environmental_Management_Plan\21452763_Fig1_Environmental_Protection_Plan_QuarterSection_Referenced_Printed_ON_2023-09-15_10:32:38.PM

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B



NOTE 1 - Raptor Nest Interactions:

NA

NOTE 2 - Direct Wetland or Ephemeral Waterbody Interactions (Class I, II, III, IV and V):

Direct impacts to wetlands can not extend beyond the Project Footprint and as outlined in this plan. Wetland boundaries between the Project footprint and wetland will be marked before construction start, and silt fencing will be installed to prevent vehicle traffic from entering wetlands that extend outside of the footprint when work cannot be scheduled under dry or frozen conditions. Plan construction during dry ground conditions to the extent possible, and use rig matting, geotextiles, vegetated buffer zones, earthen berms as appropriate. Wetlands temporarily disturbed will naturally regenerate from seeds present in the soil and from adjacent areas. Plan construction outside of the sensitive amphibian breeding period or implement mitigations for amphibians when intersecting Class III, IV or V (Refer to Note 4).

NOTE 3 - Wetlands within 5 m of the Footprint (Ephemeral waterbodies, drainages, Class II and higher):

NA

NOTE 4 - Within 100 m of a Class III, IV, or V (Amphibians and Waterbirds):

Schedule construction outside of the amphibian active period (i.e., breeding period and post-breeding period to first frost, approximately April 15 to September 15). When construction within 100 m wetlands setbacks with the potential to support amphibian populations cannot be scheduled outside the amphibian active period (April 15 to September 15), a pre-construction amphibian survey will be conducted. If the pre-construction amphibian survey confirms the presence of amphibians, exclusion fencing will be installed and maintained along the nearest edge of the Project Footprint. An experienced wildlife biologist or qualified environmental monitor will conduct an amphibian salvage program, if required. Nest searches will be performed within the 100 m setback by an experienced wildlife biologist, to identify breeding birds or their nests if construction is scheduled between April 1 and August 28. If breeding activity is identified, an appropriate setback buffer will be applied.

NOTE 5 - Direct Wetland Interactions - Class IV Collector Line Crossings:

Class IV wetlands that interact with collector lines will be horizontally directionally drilled (HDD). No direct disturbance to Class IV wetlands has been permitted. An HDD frac out plan will be available from the EPC contractor. Silt fencing will be installed between the wetland and the nearest edge of the Project Footprint if construction cannot be scheduled during dry or frozen conditions.

GENERAL NOTE - All non cultivated areas within 100 m of construction activities:

Schedule construction outside of recommended restricted activity periods (April 1 to August 28) within all non-cultivated habitats. If construction activities occur between April 1 and August 28, non-intrusive, pre-construction nest surveys will be performed an experienced wildlife biologist within 100 m of construction activity prior to construction. If breeding activity is identified, a minimum setback buffer of 100 m will be applied to the suspected nest location until young fledge to minimize the risk of disturbing birds, nests, or eggs. When there is potential for construction activities to pose an elevated risk to wildlife, an experienced wildlife biologist will be on site to monitor wildlife behaviour and to propose on site mitigation actions that should be implemented to reduce risk to wildlife.

GENERAL NOTE - Vegetation Clearing:

Vegetation clearing will be limited to the Project Footprint and the smallest area practicable. Where possible, short shrub species will be "walked down" or simply driven over to preserve the growth crown and root network, thereby enhancing regeneration after construction is complete. Plan vegetation clearing in all non-cultivated habitats outside of the restricted activity period (April 1 – August 28) to the extent possible (refer to General Note – all non-cultivated areas within 100 m of construction activities).

GENERAL NOTE - Clubroot and Weeds:

All vehicles and construction equipment will be clean (i.e., free of soils and vegetative debris) and disinfected (and documented) prior to arrival at the Project area and cleaned prior to leaving the Project area. All vehicles and equipment will be physically cleaned to remove soil and crop debris before traversing between fields as identified by the land agent or Environmental Monitor. Choose low traffic grassy areas near the field exit to complete cleaning when possible. Remove soil and crop debris by knocking or scraping off soil lumps and sweeping loose soil and vegetation from all equipment, vehicles, or tools used during project activities. Compressed air can be used to blow off any residue left on the machinery after scraping. A pressure washer should be used to remove soil and vegetation if the equipment was operated during wet conditions. Salvaged soil materials will not be moved between different sites. Areas that exhibit extensive weed infestations prior to disturbance will have soils salvaged and stockpiled separately to prevent the contamination of larger reclamation soil volumes.

GENERAL NOTE - Turbine Foundation:

Mortality due to foundation construction activities, while not expected, may occur if wildlife falls into or becomes trapped within foundation excavations. To prevent wildlife from inadvertently falling in, open excavations or auger holes will be temporarily fenced off. Open excavations or auger holes left unsupervised will be checked daily to ensure no wildlife is trapped.

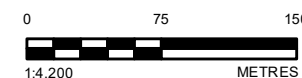
Category	Applicability	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
Raptor Nest Breeding Period	Raptor Nests and Setbacks			Wildlife Monitor Required when working in Setback 15-Mar				15-Jul					
Grassland Breeding Bird Nesting Period (April 1- July 15) and Migratory Bird Nesting Period, Nesting Zone B4 (April 14 - August 28)	All non cultivated areas within 100 m of construction activity.				Nest Sweep Required								
Amphibian Active Period (April 15 - September 15)	Direct impacts to Class III, IV and V wetlands, or work within 100 m setbacks of Class III, IV and V wetlands				1-Apr Pre-Construction Amphibian Survey, Silt Fencing and Amphibian Monitoring Required as per Referral Report*				28-Aug Pre-Construction Amphibian Survey, Silt Fencing and Amphibian Monitoring Recommended*				
					15-Apr		14-Jun			15-Sep			

*It is recommended that best practices for amphibian mitigation are applied during the frost-free season from about April to September 15.

REFERENCE(S)

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2. 2018 ORTHOPHOTO OBTAINED FROM TARIN RESOURCE SERVICES LTD.

PROJECTION: UTM ZONE 12 DATUM: NAD 83



CLIENT **Capital Power**

PROJECT **HALKIRK 2 WIND POWER PROJECT**

TITLE **QUARTER SECTION: SE 7-40-14 W4M**

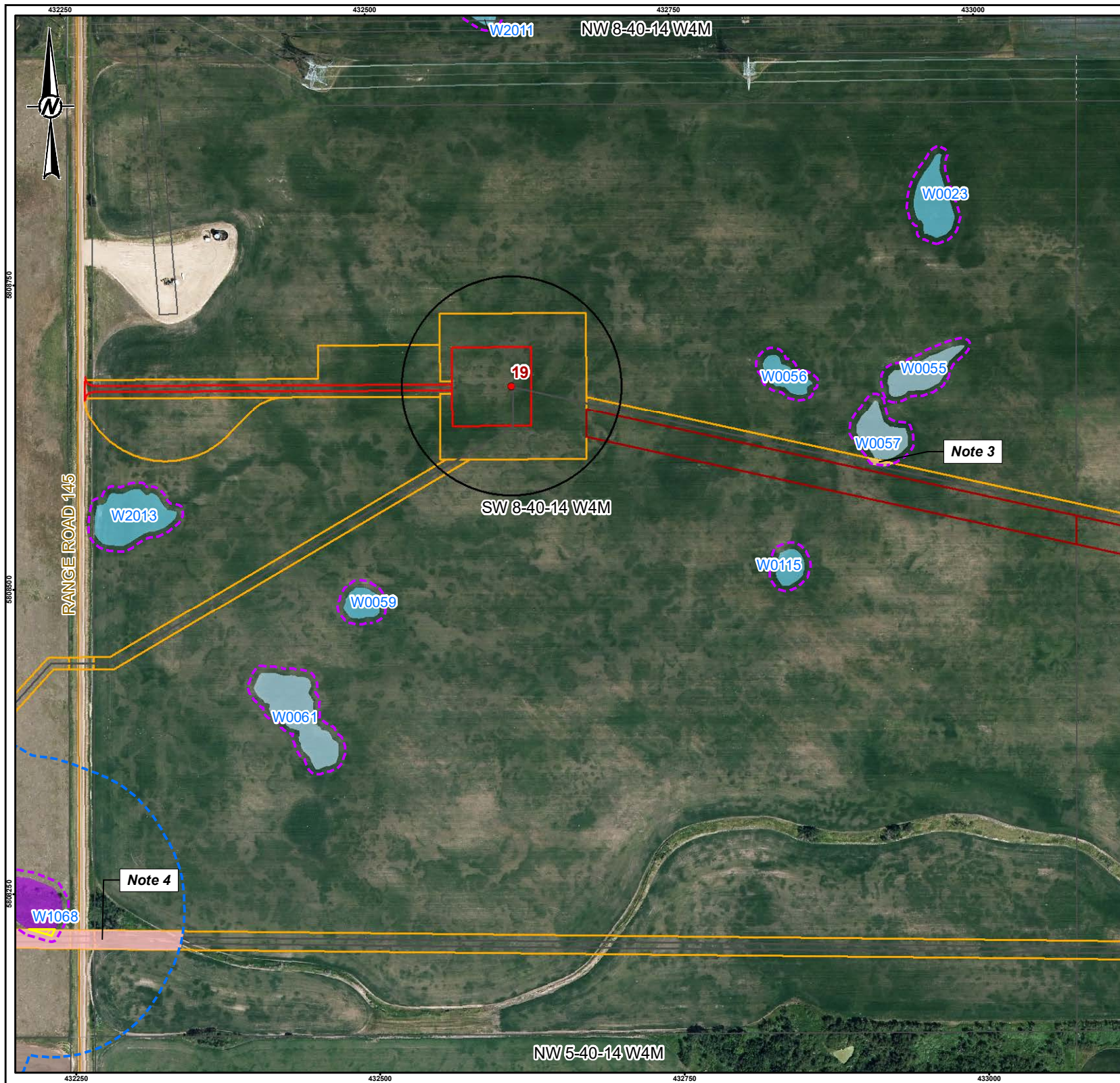
CONSULTANT **wsp**

DESIGNED	SC
PREPARED	LB
REVIEWED	SC
APPROVED	SC

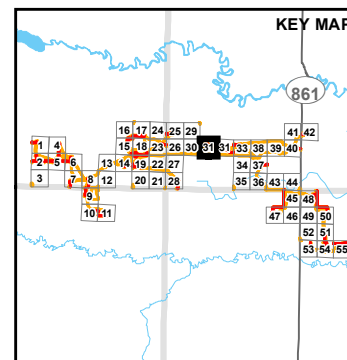
PROJECT NO. 21452763 PHASE REV. 0 FIGURE 30

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IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B



- LEGEND**
- CADASTRAL
 - LOCAL ROAD
 - TURBINE
 - ROTOR-SWEPT AREA
 - UNDERGROUND COLLECTOR SYSTEM
 - CRANE PATH
 - OPERATION FOOTPRINT
 - CONSTRUCTION FOOTPRINT
- ENVIRONMENTAL CONSTRAINTS**
- AREA OF FOOTPRINT INTERACTION/MITIGATION (SEE NOTES)
 - WETLAND SETBACK (5 m) INTERACTION (Silt fencing between the Project Footprint and wetland when work cannot be scheduled during dry or frozen periods.)
 - WETLAND (CLASS III+) SETBACK (100 m) INTERACTION
- WETLAND AND WATER BODY PERMANENCE**
- EPHEMERAL (CLASS I) WATER BODY
 - TEMPORARY (CLASS II) WETLAND
 - SEMI-PERMANENT (CLASS IV) WETLAND
 - WETLAND (CLASS III+) SETBACK (100 m)
 - WETLAND SETBACK (5 m)



NOTE 1 - Raptor Nest Interactions:

NA

NOTE 2 - Direct Wetland or Ephemeral Waterbody Interactions (Class I, II, III, IV and V):

NA

NOTE 3 - Wetlands within 5 m of the Footprint (Ephemeral waterbodies, drainages, Class II and higher):

Wetlands, ephemeral water bodies and drainages within 5 m of the Project Footprint will be marked prior to construction. Silt fencing will be installed between the wetland and the nearest edge of the Project Footprint if construction cannot be scheduled during dry or frozen conditions. The Environmental Monitor may require additional silt fencing as required based on site conditions. Alternatively, the Environmental Monitor may determine silt fencing is not needed based on the distance of the wettest edge to the Project Footprint.

NOTE 4 - Within 100 m of a Class III, IV, or V (Amphibians and Waterbirds):

Schedule construction outside of the amphibian active period (i.e., breeding period and post-breeding period to first frost, approximately April 15 to September 15). When construction within 100 m wetlands setbacks with the potential to support amphibian populations cannot be scheduled outside the amphibian active period (April 15 to September 15), a pre-construction amphibian survey will be conducted. If the pre-construction amphibian survey confirms the presence of amphibians, exclusion fencing will be installed and maintained along the nearest edge of the Project Footprint. An experienced wildlife biologist or qualified environmental monitor will conduct an amphibian salvage program, if required. Nest searches will be performed within the 100 m setback by an experienced wildlife biologist, to identify breeding birds or their nests if construction is scheduled between April 1 and August 28. If breeding activity is identified, an appropriate setback buffer will be applied.

NOTE 5 - Direct Wetland Interactions - Class IV Collector Line Crossings:

NA

GENERAL NOTE - All non cultivated areas within 100 m of construction activities:

Schedule construction outside of recommended restricted activity periods (April 1 to August 28) within all non-cultivated habitats. If construction activities occur between April 1 and August 28, non-intrusive, pre-construction nest surveys will be performed by an experienced wildlife biologist within 100 m of construction activity prior to construction. If breeding activity is identified, a minimum setback buffer of 100 m will be applied to the suspected nest location until young fledge to minimize the risk of disturbing birds, nests, or eggs. When there is potential for construction activities to pose an elevated risk to wildlife, an experienced wildlife biologist will be on site to monitor wildlife behaviour and to propose on site mitigation actions that should be implemented to reduce risk to wildlife.

GENERAL NOTE - Vegetation Clearing:

Vegetation clearing will be limited to the Project Footprint and the smallest area practicable. Where possible, short shrub species will be "walked down" or simply driven over to preserve the growth crown and root network, thereby enhancing regeneration after construction is complete. Plan vegetation clearing in all non-cultivated habitats outside of the restricted activity period (April 1 – August 28) to the extent possible (refer to General Note – all non-cultivated areas within 100 m of construction activities).

GENERAL NOTE - Clubroot and Weeds:

All vehicles and construction equipment will be clean (i.e., free of soils and vegetative debris) and disinfected (and documented) prior to arrival at the Project area and cleaned prior to leaving the Project area. All vehicles and equipment will be physically cleaned to remove soil and crop debris before traversing between fields as identified by the land agent or Environmental Monitor. Choose low traffic grassy areas near the field exit to complete cleaning when possible. Remove soil and crop debris by knocking or scraping off soil lumps and sweeping loose soil and vegetation from all equipment, vehicles, or tools used during project activities. Compressed air can be used to blow off any residue left on the machinery after scraping. A pressure washer should be used to remove soil and vegetation if the equipment was operated during wet conditions. Salvaged soil materials will not be moved between different sites. Areas that exhibit extensive weed infestations prior to disturbance will have soils salvaged and stockpiled separately to prevent the contamination of larger reclamation soil volumes.

GENERAL NOTE - Turbine Foundation:

Mortality due to foundation construction activities, while not expected, may occur if wildlife falls into or becomes trapped within foundation excavations. To prevent wildlife from inadvertently falling in, open excavations or auger holes will be temporarily fenced off. Open excavations or auger holes left unsupervised will be checked daily to ensure no wildlife is trapped.

Category	Applicability	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
Raptor Nest Breeding Period	Raptor Nests and Setbacks			Wildlife Monitor Required when working in Setback									
				15-Mar				15-Jul					
Grassland Breeding Bird Nesting Period (April 1- July 15) and Migratory Bird Nesting Period, Nesting Zone B4 (April 14 - August 28)	All non cultivated areas within 100 m of construction activity.			Nest Sweep Required									
					1-Apr				28-Aug				
Amphibian Active Period (April 15 - September 15)	Direct impacts to Class III, IV and V wetlands, or work within 100 m setbacks of Class III, IV and V wetlands				Pre-Construction Amphibian Survey, Silt Fencing and Amphibian Monitoring Required as per Referral Report*		Pre-Construction Amphibian Survey, Silt Fencing and Amphibian Monitoring Recommended*						
					15-Apr		14-Jun			15-Sep			

*It is recommended that best practices for amphibian mitigation are applied during the frost-free season from about April to September 15.

REFERENCE(S)

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- 2018 ORTHOPHOTO OBTAINED FROM TARIN RESOURCE SERVICES LTD.

PROJECTION: UTM ZONE 12 DATUM: NAD 83



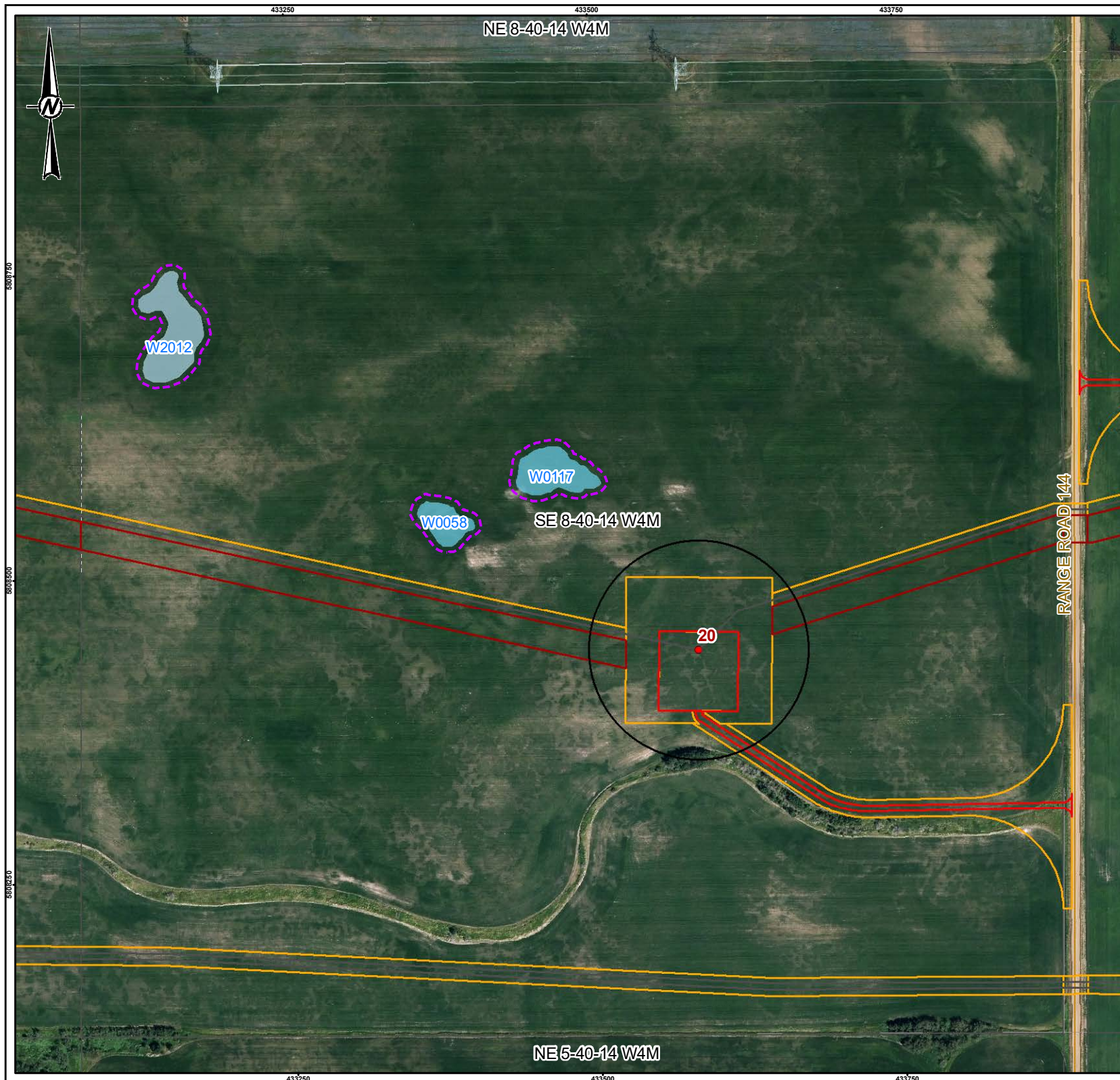
CLIENT **Capital Power**

PROJECT **HALKIRK 2 WIND POWER PROJECT**

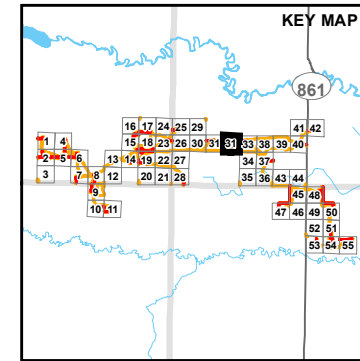
TITLE **QUARTER SECTION: SW 8-40-14 W4M**

CONSULTANT	YYYY-MM-DD	2023-09-15
DESIGNED	SC	
PREPARED	LB	
REVIEWED	SC	
APPROVED	SC	

PROJECT NO. 21452763 PHASE REV. 0 FIGURE 31



- LEGEND**
- CADASTRAL
 - LOCAL ROAD
 - PROJECT LAYOUT**
 - TURBINE
 - ROTOR-SWEPT AREA
 - UNDERGROUND COLLECTOR SYSTEM
 - CRANE PATH
 - OPERATION FOOTPRINT
 - CONSTRUCTION FOOTPRINT
 - ENVIRONMENTAL CONSTRAINTS**
 - AREA OF FOOTPRINT INTERACTION/MITIGATION (SEE NOTES)
 - WETLAND AND WATER BODY PERMANENCE**
 - EPHEMERAL (CLASS I) WATER BODY
 - TEMPORARY (CLASS II) WETLAND
 - WETLAND SETBACK (5 m)



- NOTE 1 - Raptor Nest Interactions:**
NA
- NOTE 2 - Direct Wetland or Ephemeral Waterbody Interactions (Class I, II, III, IV and V):**
NA
- NOTE 3 - Wetlands within 5 m of the Footprint (Ephemeral waterbodies, drainages, Class II and higher):**
NA
- NOTE 4 - Within 100 m of a Class III, IV, or V (Amphibians and Waterbirds):**
NA
- NOTE 5 - Direct Wetland Interactions - Class IV Collector Line Crossings:**
NA

GENERAL NOTE - All non cultivated areas within 100 m of construction activities:
Schedule construction outside of recommended restricted activity periods (April 1 to August 28) within all non-cultivated habitats. If construction activities occur between April 1 and August 28, non-intrusive, pre-construction nest surveys will be performed by an experienced wildlife biologist within 100 m of construction activity prior to construction. If breeding activity is identified, a minimum setback buffer of 100 m will be applied to the suspected nest location until young fledge to minimize the risk of disturbing birds, nests, or eggs. When there is potential for construction activities to pose an elevated risk to wildlife, an experienced wildlife biologist will be on site to monitor wildlife behaviour and to propose on site mitigation actions that should be implemented to reduce risk to wildlife.

GENERAL NOTE - Vegetation Clearing:
Vegetation clearing will be limited to the Project Footprint and the smallest area practicable. Where possible, short shrub species will be "walked down" or simply driven over to preserve the growth crown and root network, thereby enhancing regeneration after construction is complete. Plan vegetation clearing in all non-cultivated habitats outside of the restricted activity period (April 1 – August 28) to the extent possible (refer to General Note – all non-cultivated areas within 100 m of construction activities).

GENERAL NOTE - Clubroot and Weeds:
All vehicles and construction equipment will be clean (i.e., free of soils and vegetative debris) and disinfected (and documented) prior to arrival at the Project area and cleaned prior to leaving the Project area. All vehicles and equipment will be physically cleaned to remove soil and crop debris before traversing between fields as identified by the land agent or Environmental Monitor. Choose low traffic grassy areas near the field exit to complete cleaning when possible. Remove soil and crop debris by knocking or scraping off soil lumps and sweeping loose soil and vegetation from all equipment, vehicles, or tools used during project activities. Compressed air can be used to blow off any residue left on the machinery after scraping. A pressure washer should be used to remove soil and vegetation if the equipment was operated during wet conditions. Salvaged soil materials will not be moved between different sites. Areas that exhibit extensive weed infestations prior to disturbance will have soils salvaged and stockpiled separately to prevent the contamination of larger reclamation soil volumes.

GENERAL NOTE - Turbine Foundation:
Mortality due to foundation construction activities, while not expected, may occur if wildlife falls into or becomes trapped within foundation excavations. To prevent wildlife from inadvertently falling in, open excavations or auger holes will be temporarily fenced off. Open excavations or auger holes left unsupervised will be checked daily to ensure no wildlife is trapped.

Category	Applicability	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
Raptor Nest Breeding Period	Raptor Nests and Setbacks			Wildlife Monitor Required when working in Setback									
				15-Mar				15-Jul					
Grassland Breeding Bird Nesting Period (April 1- July 15) and Migratory Bird Nesting Period, Nesting Zone B4 (April 14 - August 28)	All non cultivated areas within 100 m of construction activity.			Nest Sweep Required									
					1-Apr				28-Aug				
Amphibian Active Period (April 15 - September 15)	Direct impacts to Class III, IV and V wetlands, or work within 100 m setbacks of Class III, IV and V wetlands				Pre-Construction Amphibian Survey, Silt Fencing and Amphibian Monitoring Required as per Referral Report*		Pre-Construction Amphibian Survey, Silt Fencing and Amphibian Monitoring Recommended*						
					15-Apr		14-Jun			15-Sep			

*It is recommended that best practices for amphibian mitigation are applied during the frost-free season from about April to September 15.

REFERENCE(S)
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2. 2018 ORTHOPHOTO OBTAINED FROM TARIN RESOURCE SERVICES LTD.

PROJECTION: UTM ZONE 12 DATUM: NAD 83



CLIENT **Capital Power**

PROJECT **HALKIRK 2 WIND POWER PROJECT**

TITLE **QUARTER SECTION: SE 8-40-14 W4M**

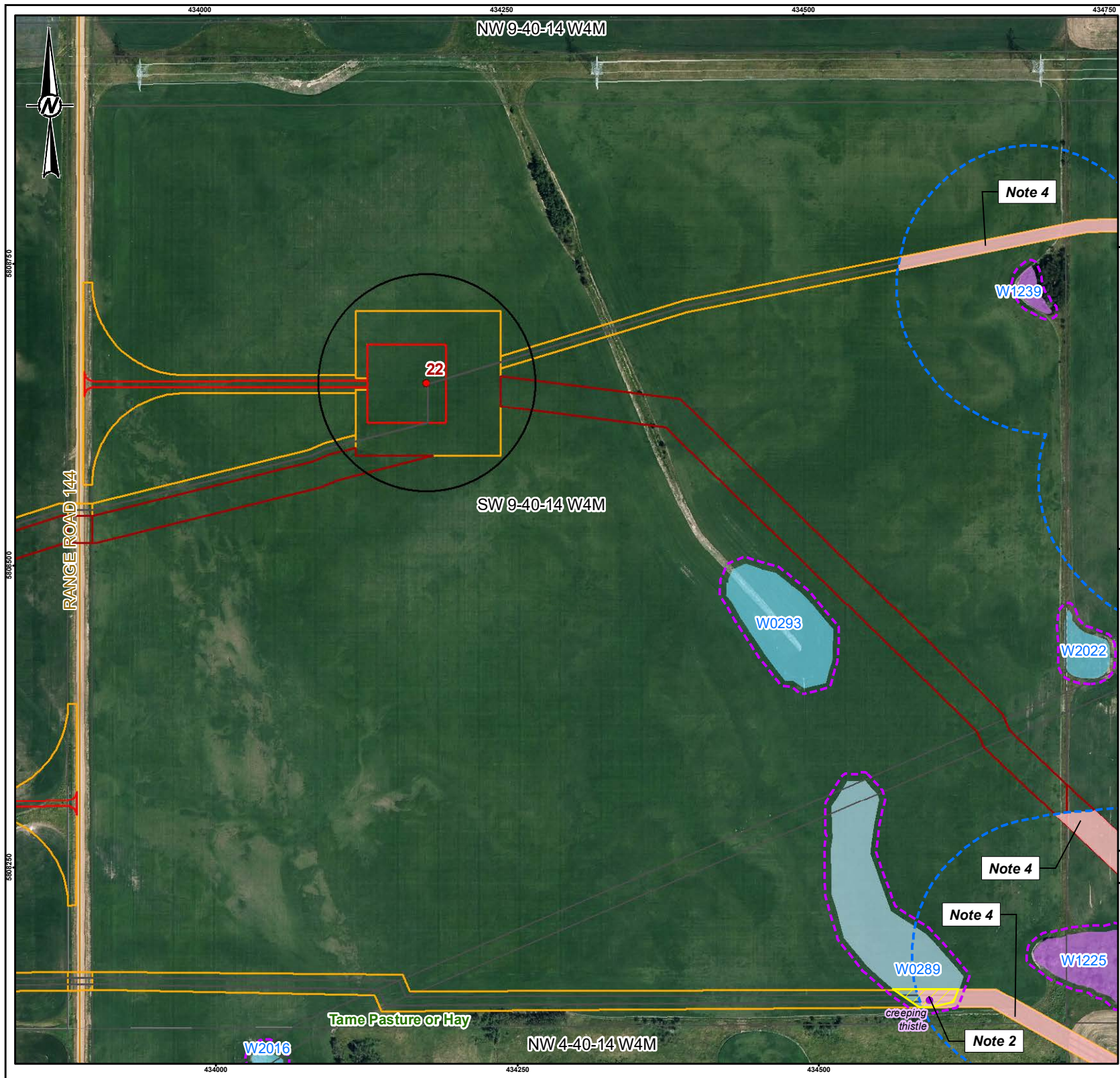
CONSULTANT

YYYY-MM-DD	2023-09-15
DESIGNED	SC
PREPARED	LB
REVIEWED	SC
APPROVED	SC

PROJECT NO. 21452763 PHASE REV. 0 FIGURE 32

PATH: I:\CLIENT\CAPITAL_POWER\21452763\Mapping\Production\Environmental_Management_Plan\21452763_Fig1_Environmental_Protection_Plan_QuarterSection_Referenced_Printed_ON_2023-09-15_AT_3:33:22_PM

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B



LEGEND

- CADASTRAL
- LOCAL ROAD
- PROJECT LAYOUT**
 - TURBINE
 - ROTOR-SWEPT AREA
 - UNDERGROUND COLLECTOR SYSTEM
 - CRANE PATH
 - OPERATION FOOTPRINT
 - CONSTRUCTION FOOTPRINT
- ENVIRONMENTAL CONSTRAINTS**
 - AREA OF FOOTPRINT INTERACTION/MITIGATION (SEE NOTES)
 - WETLAND (CLASS III+) SETBACK (100 m) INTERACTION
- WETLAND AND WATER BODY PERMANENCE**
 - EPHEMERAL (CLASS I) WATER BODY
 - TEMPORARY (CLASS II) WETLAND
 - SEASONAL (CLASS III) WETLAND
 - WETLAND (CLASS III+) SETBACK (100 m)
 - WETLAND SETBACK (5 m)
- WEED OBSERVATION**
 - NOXIOUS WEED SPECIES OBSERVATION

KEY MAP

NOTE 1 - Raptor Nest Interactions:
NA

NOTE 2 - Direct Wetland or Ephemeral Waterbody Interactions (Class I, II, III, IV and V):
Direct impacts to wetlands can not extend beyond the Project Footprint and as outlined in this plan. Wetland boundaries between the Project footprint and wetland will be marked before construction start, and silt fencing will be installed to prevent vehicle traffic from entering wetlands that extend outside of the footprint when work cannot be scheduled under dry or frozen conditions. Plan construction during dry ground conditions to the extent possible, and use rig matting, geotextiles, vegetated buffer zones, earthen berms as appropriate. Wetlands temporarily disturbed will naturally regenerate from seeds present in the soil and from adjacent areas. Buffer construction outside of the sensitive amphibian breeding period or implement mitigations for amphibians when intersecting Class III, IV or V (Refer to Note 4).

NOTE 3 - Wetlands within 5 m of the Footprint (Ephemeral waterbodies, drainages, Class II and higher):
NA

NOTE 4 - Within 100 m of a Class III, IV, or V (Amphibians and Waterbirds):
Schedule construction outside of the amphibian active period (i.e., breeding period and post-breeding period to first frost, approximately April 15 to September 15). When construction within 100 m wetlands setbacks with the potential to support amphibian populations cannot be scheduled outside the amphibian active period (April 15 to September 15), a pre-construction amphibian survey will be conducted. If the pre-construction amphibian survey confirms the presence of amphibians, exclusion fencing will be installed and maintained along the nearest edge of the Project Footprint. An experienced wildlife biologist or qualified environmental monitor will conduct an amphibian salvage program, if required. Nest searches will be performed within the 100 m setback by an experienced wildlife biologist, to identify breeding birds or their nests if construction is scheduled between April 1 and August 28. If breeding activity is identified, an appropriate setback buffer will be applied.

NOTE 5 - Direct Wetland Interactions - Class IV Collector Line Crossings:
NA

GENERAL NOTE - All non cultivated areas within 100 m of construction activities:
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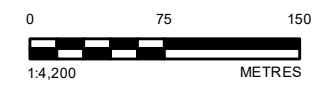
GENERAL NOTE - Turbine Foundation:
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Category	Applicability	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
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				15-Mar				15-Jul					
Grassland Breeding Bird Nesting Period (April 1- July 15) and Migratory Bird Nesting Period, Nesting Zone B4 (April 14 - August 28)	All non cultivated areas within 100 m of construction activity.			Nest Sweep Required									
				1-Apr					28-Aug				
Amphibian Active Period (April 15 - September 15)	Direct impacts to Class III, IV and V wetlands, or work within 100 m setbacks of Class III, IV and V wetlands			Pre-Construction Amphibian Survey, Silt Fencing and Amphibian Monitoring Required as per Referral Report*		Pre-Construction Amphibian Survey, Silt Fencing and Amphibian Monitoring Recommended*							
				15-Apr		14-Jun				15-Sep			

*It is recommended that best practices for amphibian mitigation are applied during the frost-free season from about April to September 15.

REFERENCE(S)
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2. 2018 ORTHOPHOTO OBTAINED FROM TARIN RESOURCE SERVICES LTD.

PROJECTION: UTM ZONE 12 DATUM: NAD 83



CLIENT **Capital Power**

PROJECT **HALKIRK 2 WIND POWER PROJECT**

TITLE **QUARTER SECTION: SW 9-40-14 W4M**

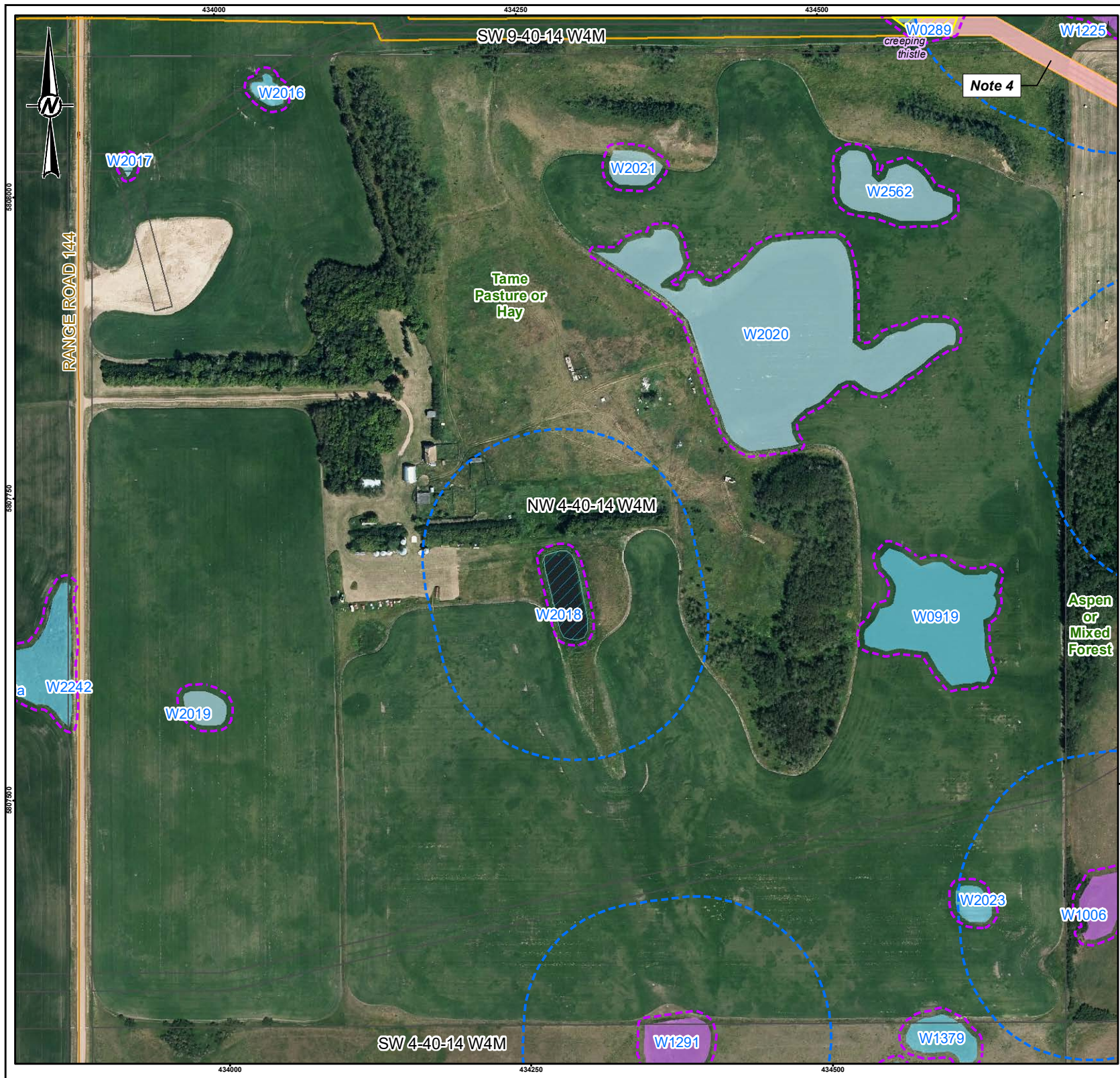
CONSULTANT **wsp**

DESIGNED	SC
PREPARED	LB
REVIEWED	SC
APPROVED	SC

PROJECT NO. 21452763 PHASE REV. 0 FIGURE 33

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IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B



NOTE 1 - Raptor Nest Interactions:
NA

NOTE 2 - Direct Wetland or Ephemeral Waterbody Interactions (Class I, II, III, IV and V):
NA

NOTE 3 - Wetlands within 5 m of the Footprint (Ephemeral waterbodies, drainages, Class II and higher):
NA

NOTE 4 - Within 100 m of a Class III, IV, or V (Amphibians and Waterbirds):
Schedule construction outside of the amphibian active period (i.e., breeding period and post-breeding period to first frost, approximately April 15 to September 15). When construction within 100 m wetlands setbacks with the potential to support amphibian populations cannot be scheduled outside the amphibian active period (April 15 to September 15), a pre-construction amphibian survey will be conducted. If the pre-construction amphibian survey confirms the presence of amphibians, exclusion fencing will be installed and maintained along the nearest edge of the Project Footprint. An experienced wildlife biologist or qualified environmental monitor will conduct an amphibian salvage program, if required. Nest searches will be performed within the 100 m setback by an experienced wildlife biologist, to identify breeding birds or their nests if construction is scheduled between April 1 and August 28. If breeding activity is identified, an appropriate setback buffer will be applied.

NOTE 5 - Direct Wetland Interactions - Class IV Collector Line Crossings:
NA

GENERAL NOTE - All non cultivated areas within 100 m of construction activities:
Schedule construction outside of recommended restricted activity periods (April 1 to August 28) within all non-cultivated habitats. If construction activities occur between April 1 and August 28, non-intrusive, pre-construction nest surveys will be performed an experienced wildlife biologist within 100 m of construction activity prior to construction. If breeding activity is identified, a minimum setback buffer of 100 m will be applied to the suspected nest location until young fledge to minimize the risk of disturbing birds, nests, or eggs. When there is potential for construction activities to pose an elevated risk to wildlife, an experienced wildlife biologist will be on site to monitor wildlife behaviour and to propose on site mitigation actions that should be implemented to reduce risk to wildlife.

GENERAL NOTE - Vegetation Clearing:
Vegetation clearing will be limited to the Project Footprint and the smallest area practicable. Where possible, short shrub species will be "walked down" or simply driven over to preserve the growth crown and root network, thereby enhancing regeneration after construction is complete. Plan vegetation clearing in all non-cultivated habitats outside of the restricted activity period (April 1 – August 28) to the extent possible (refer to General Note – all non-cultivated areas within 100 m of construction activities).

GENERAL NOTE - Clubroot and Weeds:
All vehicles and construction equipment will be clean (i.e., free of soils and vegetative debris) and disinfected (and documented) prior to arrival at the Project area and cleaned prior to leaving the Project area. All vehicles and equipment will be physically cleaned to remove soil and crop debris before traversing between fields as identified by the land agent or Environmental Monitor. Choose low traffic grassy areas near the field exit to complete cleaning when possible. Remove soil and crop debris by knocking or scraping off soil lumps and sweeping loose soil and vegetation from all equipment, vehicles, or tools used during project activities. Compressed air can be used to blow off any residue left on the machinery after scraping. A pressure washer should be used to remove soil and vegetation if the equipment was operated during wet conditions. Salvaged soil materials will not be moved between different sites. Areas that exhibit extensive weed infestations prior to disturbance will have soils salvaged and stockpiled separately to prevent the contamination of larger reclamation soil volumes.

GENERAL NOTE - Turbine Foundation:
Mortality due to foundation construction activities, while not expected, may occur if wildlife falls into or becomes trapped within foundation excavations. To prevent wildlife from inadvertently falling in, open excavations or auger holes will be temporarily fenced off. Open excavations or auger holes left unsupervised will be checked daily to ensure no wildlife is trapped.

Category	Applicability	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
Raptor Nest Breeding Period	Raptor Nests and Setbacks			Wildlife Monitor Required when working in Setback									
				15-Mar				15-Jul					
Grassland Breeding Bird Nesting Period (April 1- July 15) and Migratory Bird Nesting Period, Nesting Zone B4 (April 14 - August 28)	All non cultivated areas within 100 m of construction activity.			Nest Sweep Required									
					1-Apr				28-Aug				
Amphibian Active Period (April 15 - September 15)	Direct impacts to Class III, IV and V wetlands, or work within 100 m setbacks of Class III, IV and V wetlands				Pre-Construction Amphibian Survey, Silt Fencing and Amphibian Monitoring Required as per Referral Report*		Pre-Construction Amphibian Survey, Silt Fencing and Amphibian Monitoring Recommended*						
					15-Apr	14-Jun				15-Sep			

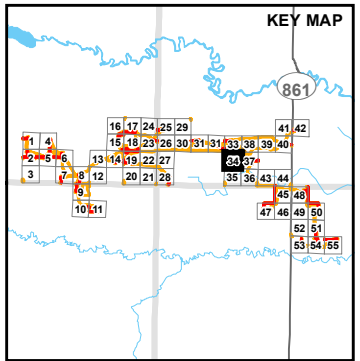
*It is recommended that best practices for amphibian mitigation are applied during the frost-free season from about April to September 15.

- LEGEND**
- CADASTRAL
 - LOCAL ROAD
 - UNDERGROUND COLLECTOR SYSTEM
 - CONSTRUCTION FOOTPRINT

- ENVIRONMENTAL CONSTRAINTS**
- AREA OF FOOTPRINT INTERACTION/MITIGATION (SEE NOTES)
 - WETLAND (CLASS III+) SETBACK (100 m) INTERACTION

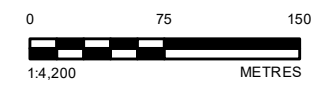
- WETLAND AND WATER BODY PERMANENCE**
- EPHEMERAL (CLASS I) WATER BODY
 - TEMPORARY (CLASS II) WETLAND
 - SEASONAL (CLASS III) WETLAND
 - ANTHROPOGENIC WATER BODY/MODIFIED NATURAL WETLAND
 - WETLAND (CLASS III+) SETBACK (100 m)
 - WETLAND SETBACK (5 m)

- WEED OBSERVATION**
- NOXIOUS WEED SPECIES OBSERVATION



REFERENCE(S)
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2. 2018 ORTHOPHOTO OBTAINED FROM TARIN RESOURCE SERVICES LTD.

PROJECTION: UTM ZONE 12 DATUM: NAD 83



CLIENT **Capital Power**

PROJECT **HALKIRK 2 WIND POWER PROJECT**

TITLE **QUARTER SECTION: NW 4-40-14 W4M**

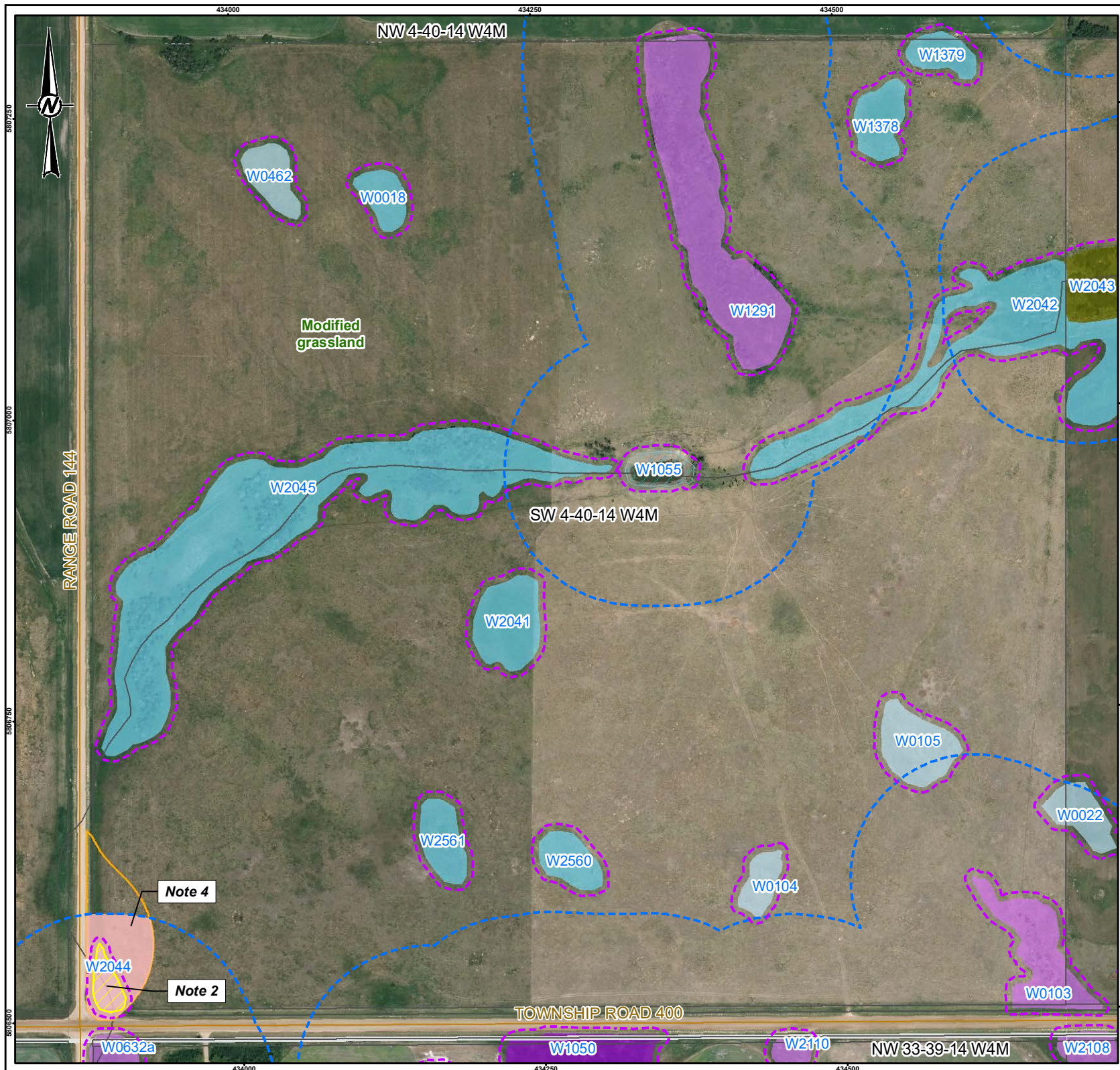
CONSULTANT

YYYY-MM-DD	2023-09-15
DESIGNED	SC
PREPARED	LB
REVIEWED	SC
APPROVED	SC

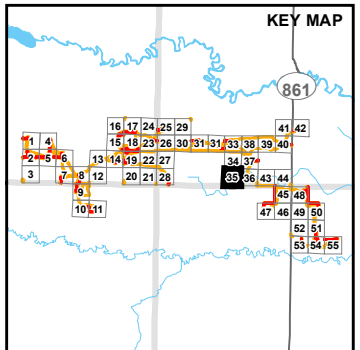
PROJECT NO. **21452763** PHASE REV. **0** FIGURE **34**

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IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B



LEGEND		WETLAND AND WATER BODY PERMANENCE	
	CADASTRAL		EPHEMERAL (CLASS I) WATER BODY
	LOCAL ROAD		TEMPORARY (CLASS II) WETLAND
	CONSTRUCTION FOOTPRINT		SEASONAL (CLASS III) WETLAND
	ENVIRONMENTAL CONSTRAINTS		SEMI-PERMANENT (CLASS IV) WETLAND
	AREA OF FOOTPRINT INTERACTION/MITIGATION (SEE NOTES)		ANTHROPOGENIC WATER BODY/MODIFIED NATURAL WETLAND
	WETLAND (CLASS III+) SETBACK (100 m) INTERACTION		WOODED DECIDUOUS SWAMP
			WETLAND (CLASS III+) SETBACK (100 m)
			WETLAND SETBACK (5 m)



NOTE 1 - Raptor Nest Interactions:
NA

NOTE 2 - Direct Wetland or Ephemeral Waterbody Interactions (Class I, II, III, IV and V):
Direct impacts to wetlands can not extend beyond the Project Footprint and as outlined in this plan. Wetland boundaries between the Project footprint and wetland will be marked before construction start, and silt fencing will be installed to prevent vehicle traffic from entering wetlands that extend outside of the footprint when work cannot be scheduled under dry or frozen conditions. Plan construction during dry ground conditions to the extent possible, and use rig matting, geotextiles, vegetated buffer zones, earthen berms as appropriate. Wetlands temporarily disturbed will naturally regenerate from seeds present in the soil and from adjacent areas. Plan construction outside of the sensitive amphibian breeding period or implement mitigations for amphibians when intersecting Class III, IV or V (Refer to Note 4).

NOTE 3 - Wetlands within 5 m of the Footprint (Ephemeral waterbodies, drainages, Class II and higher):
NA

NOTE 4 - Within 100 m of a Class III, IV, or V (Amphibians and Waterbirds):
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NOTE 5 - Direct Wetland Interactions - Class IV Collector Line Crossings:
NA

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GENERAL NOTE - Turbine Foundation:
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Category	Applicability	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
Raptor Nest Breeding Period	Raptor Nests and Setbacks			Wildlife Monitor Required when working in Setback									
				15-Mar				15-Jul					
Grassland Breeding Bird Nesting Period (April 1- July 15) and Migratory Bird Nesting Period, Nesting Zone B4 (April 14 - August 28)	All non cultivated areas within 100 m of construction activity.			Nest Sweep Required									
					1-Apr				28-Aug				
Amphibian Active Period (April 15 - September 15)	Direct impacts to Class III, IV and V wetlands, or work within 100 m setbacks of Class III, IV and V wetlands				Pre-Construction Amphibian Survey, Silt Fencing and Amphibian Monitoring Required as per Referral Report*		Pre-Construction Amphibian Survey, Silt Fencing and Amphibian Monitoring Recommended*						
					15-Apr	14-Jun				15-Sep			

*It is recommended that best practices for amphibian mitigation are applied during the frost-free season from about April to September 15.

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2. 2018 ORTHOPHOTO OBTAINED FROM TARIN RESOURCE SERVICES LTD.

PROJECTION: UTM ZONE 12 DATUM: NAD 83

CLIENT **Capital Power**

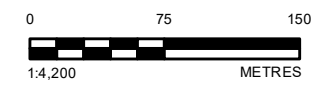
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TITLE **QUARTER SECTION: SW 4-40-14 W4M**

CONSULTANT **wsp**

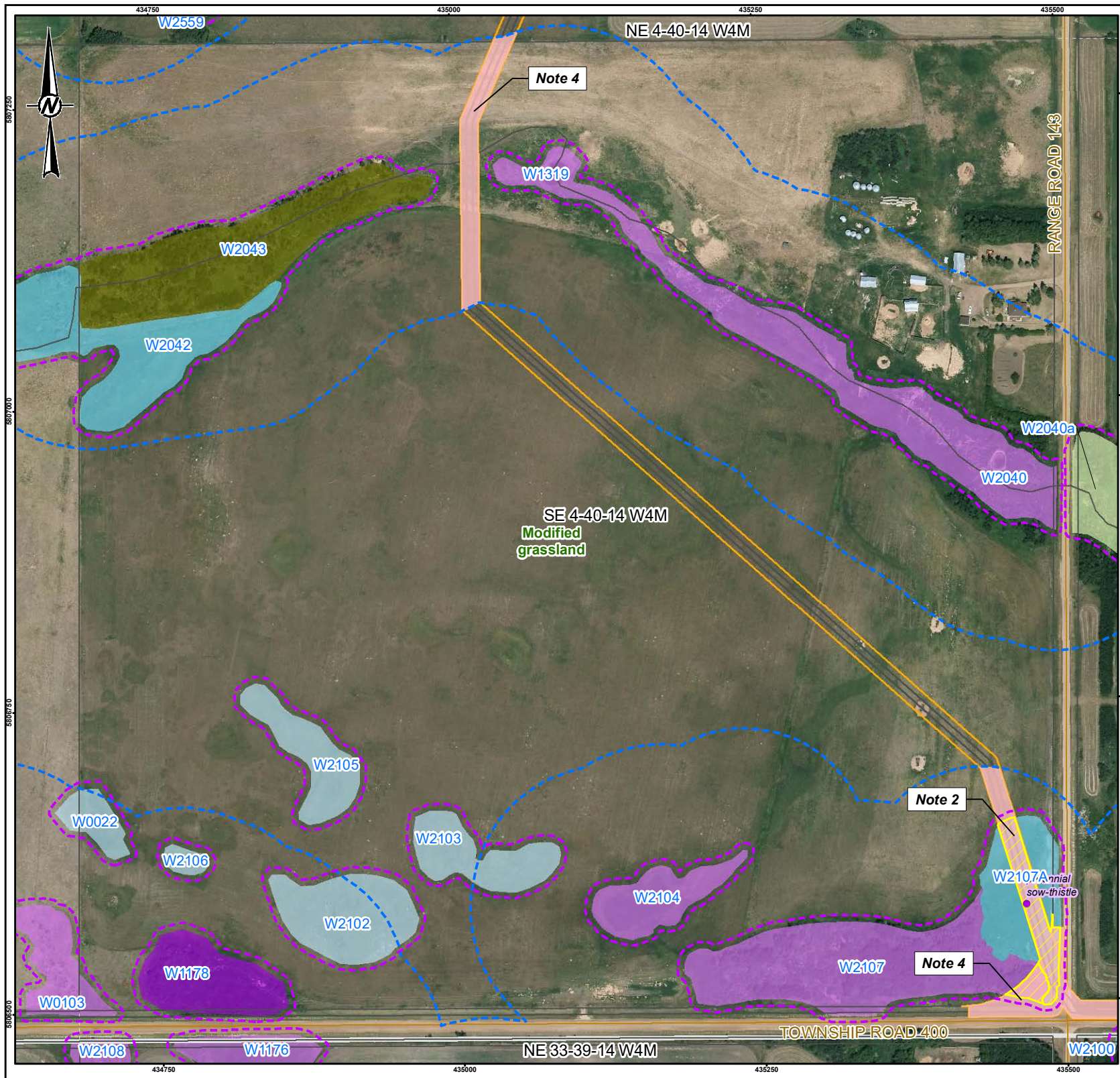
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PREPARED	LB
REVIEWED	SC
APPROVED	SC

PROJECT NO. 21452763 PHASE REV. 0 FIGURE 35

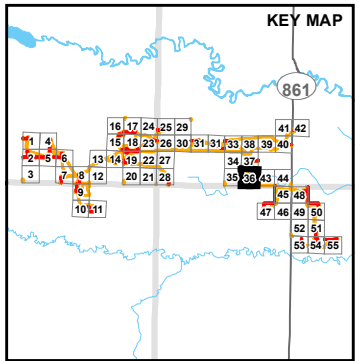


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IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B



LEGEND	
	CADASTRAL
	LOCAL ROAD
	UNDERGROUND COLLECTOR SYSTEM
	CONSTRUCTION FOOTPRINT
	AREA OF FOOTPRINT INTERACTION/MITIGATION (SEE NOTES)
	WETLAND (CLASS III+) SETBACK (100 m) INTERACTION
	EPHEMERAL (CLASS I) WATER BODY
	TEMPORARY (CLASS II) WETLAND
	SEASONAL (CLASS III) WETLAND
	SEMI-PERMANENT (CLASS IV) WETLAND
	NATURAL DRAINAGE
	WOODED DECIDUOUS SWAMP
	WETLAND (CLASS III+) SETBACK (100 m)
	WETLAND SETBACK (5 m)
	NOXIOUS WEED SPECIES OBSERVATION



NOTE 1 - Raptor Nest Interactions:
NA

NOTE 2 - Direct Wetland or Ephemeral Waterbody Interactions (Class I, II, III, IV and V):
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NOTE 3 - Wetlands within 5 m of the Footprint (Ephemeral waterbodies, drainages, Class II and higher):
NA

NOTE 4 - Within 100 m of a Class III, IV, or V (Amphibians and Waterbirds):
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NOTE 5 - Direct Wetland Interactions - Class IV Collector Line Crossings:
NA

GENERAL NOTE - All non cultivated areas within 100 m of construction activities:
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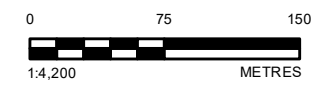
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Category	Applicability	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
Raptor Nest Breeding Period	Raptor Nests and Setbacks			Wildlife Monitor Required when working in Setback									
				15-Mar				15-Jul					
Grassland Breeding Bird Nesting Period (April 1- July 15) and Migratory Bird Nesting Period, Nesting Zone B4 (April 14 - August 28)	All non cultivated areas within 100 m of construction activity.			Nest Sweep Required									
				1-Apr					28-Aug				
Amphibian Active Period (April 15 - September 15)	Direct impacts to Class III, IV and V wetlands, or work within 100 m setbacks of Class III, IV and V wetlands			Pre-Construction Amphibian Survey, Silt Fencing and Amphibian Monitoring Required as per Referral Report*		Pre-Construction Amphibian Survey, Silt Fencing and Amphibian Monitoring Recommended*							
				15-Apr		14-Jun				15-Sep			

*It is recommended that best practices for amphibian mitigation are applied during the frost-free season from about April to September 15.

REFERENCE(S)
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2. 2018 ORTHOPHOTO OBTAINED FROM TARIN RESOURCE SERVICES LTD.

PROJECTION: UTM ZONE 12 DATUM: NAD 83



CLIENT **Capital Power**

PROJECT **HALKIRK 2 WIND POWER PROJECT**

TITLE **QUARTER SECTION: SE 4-40-14 W4M**

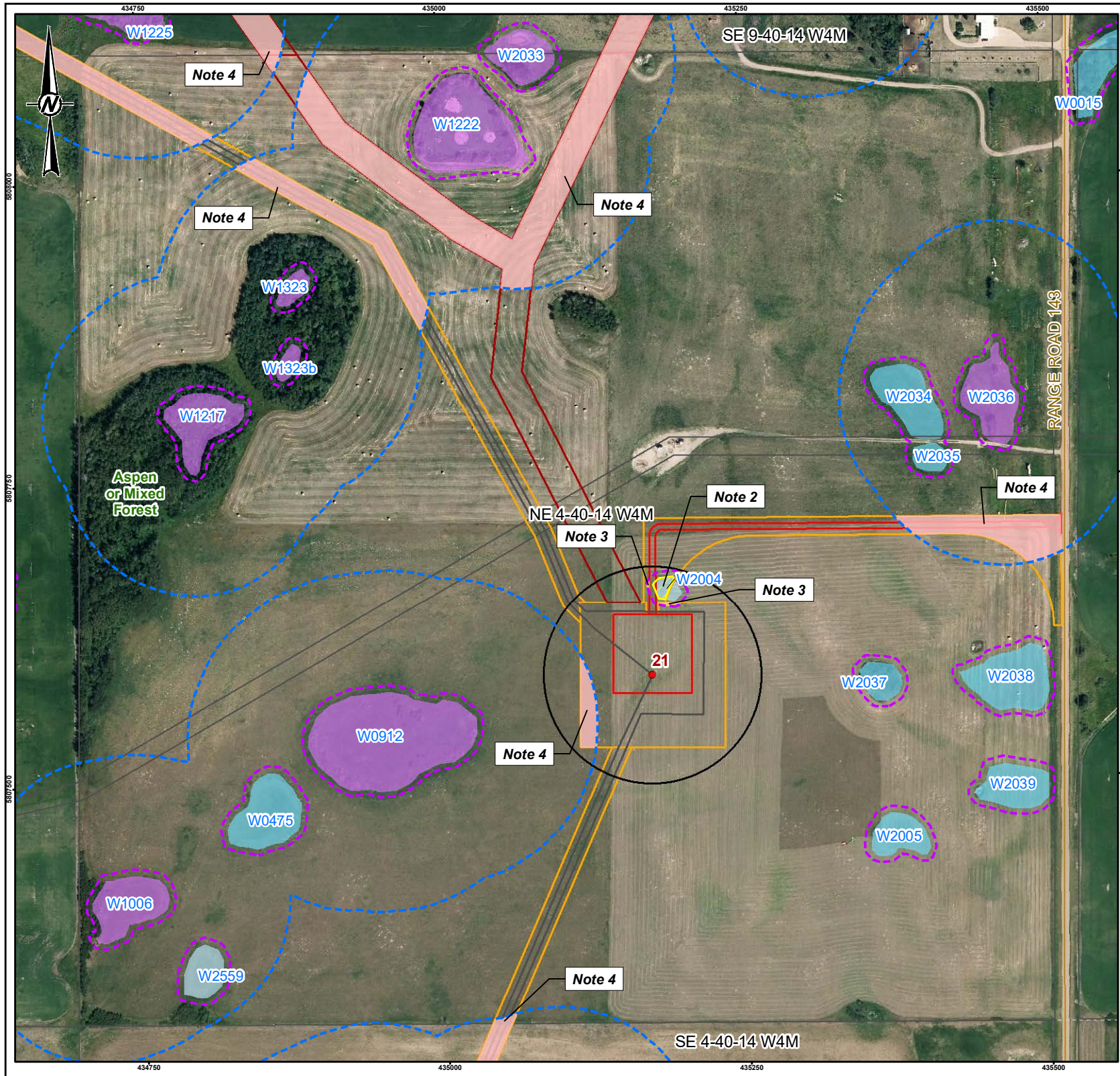
CONSULTANT **wsp**

YYYY-MM-DD	2023-09-15
DESIGNED	SC
PREPARED	LB
REVIEWED	SC
APPROVED	SC

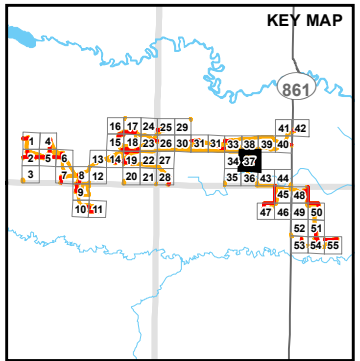
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IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B



- LEGEND**
- CADASTRAL
 - LOCAL ROAD
 - PROJECT LAYOUT**
 - TURBINE
 - ROTOR-SWEPT AREA
 - UNDERGROUND COLLECTOR SYSTEM
 - CRANE PATH
 - OPERATION FOOTPRINT
 - CONSTRUCTION FOOTPRINT
 - ENVIRONMENTAL CONSTRAINTS**
 - AREA OF FOOTPRINT INTERACTION/MITIGATION (SEE NOTES)
 - WETLAND SETBACK (5 m) INTERACTION (Silt fencing between the Project Footprint and wetland when work cannot be scheduled during dry or frozen periods.)
 - WETLAND (CLASS III+) SETBACK (100 m) INTERACTION
 - WETLAND AND WATER BODY PERMANENCE**
 - EPHEMERAL (CLASS I) WATER BODY
 - TEMPORARY (CLASS II) WETLAND
 - SEASONAL (CLASS III) WETLAND
 - WETLAND (CLASS III+) SETBACK (100 m)
 - WETLAND SETBACK (5 m)



NOTE 1 - Raptor Nest Interactions:
NA

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NOTE 3 - Wetlands within 5 m of the Footprint (Ephemeral waterbodies, drainages, Class II and higher):
Wetlands, ephemeral water bodies and drainages within 5 m of the Project Footprint will be marked prior to construction. Silt fencing will be installed between the wetland and the nearest edge of the Project Footprint if construction cannot be scheduled during dry or frozen conditions. The Environmental Monitor may require additional silt fencing as required based on site conditions. Alternatively, the Environmental Monitor may determine silt fencing is not needed based on the distance of the wettest edge to the Project Footprint.

NOTE 4 - Within 100 m of a Class III, IV, or V (Amphibians and Waterbirds):
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NOTE 5 - Direct Wetland Interactions - Class IV Collector Line Crossings:
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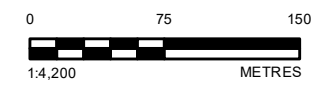
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					15-Apr		14-Jun			15-Sep			

*It is recommended that best practices for amphibian mitigation are applied during the frost-free season from about April to September 15.

REFERENCE(S)
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2. 2018 ORTHOPHOTO OBTAINED FROM TARIN RESOURCE SERVICES LTD.

PROJECTION: UTM ZONE 12 DATUM: NAD 83



CLIENT **Capital Power**

PROJECT **HALKIRK 2 WIND POWER PROJECT**

TITLE **QUARTER SECTION: NE 4-40-14 W4M**

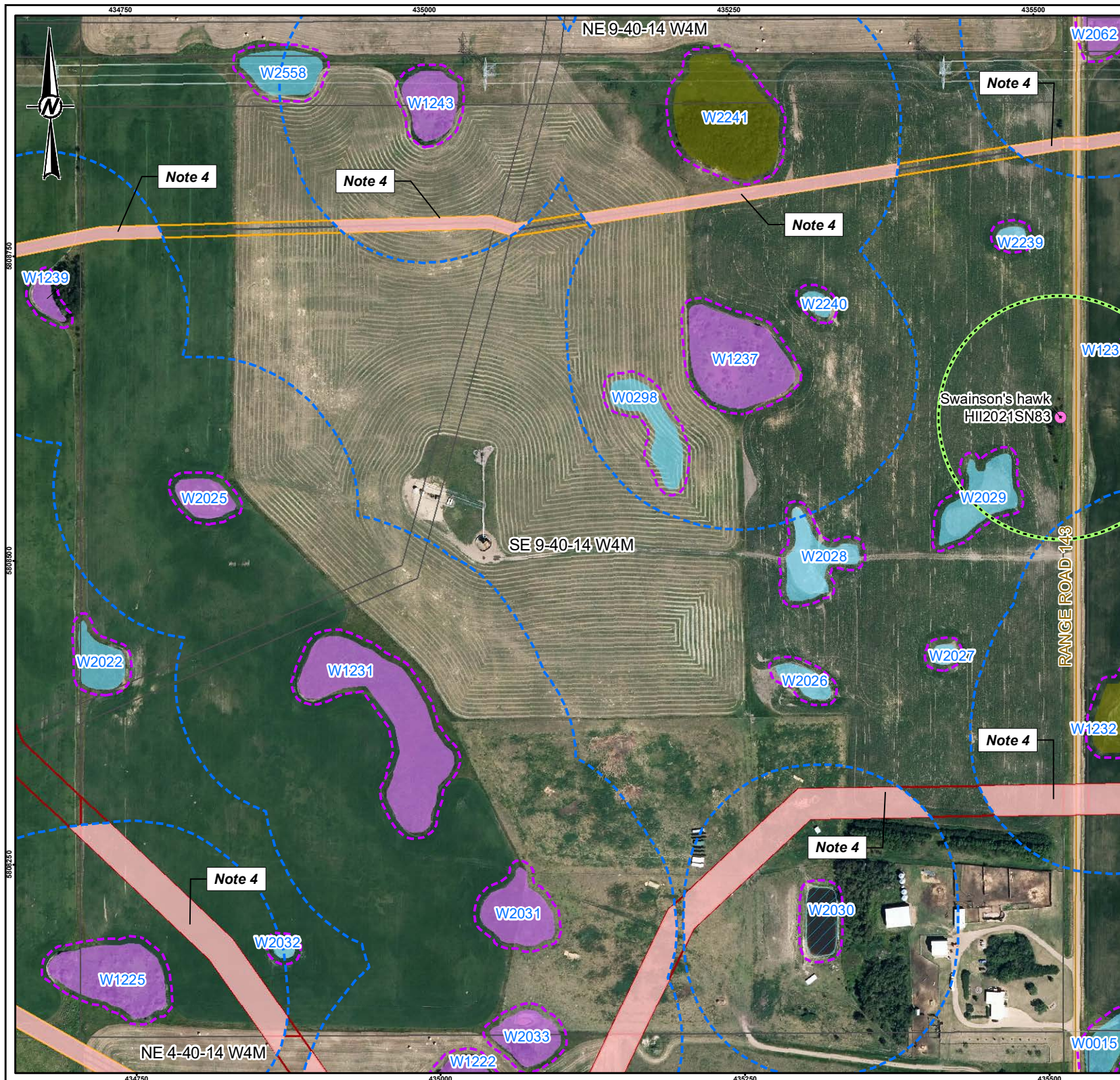
CONSULTANT **wsp**

YYYY-MM-DD	2023-09-15
DESIGNED	SC
PREPARED	LB
REVIEWED	SC
APPROVED	SC

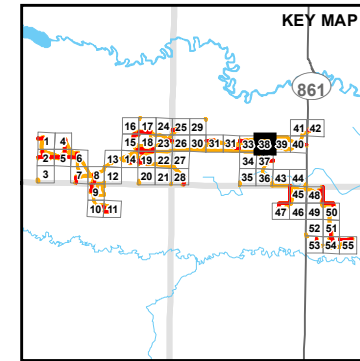
PROJECT NO. 21452763 PHASE APPROVED REV. 0 FIGURE 37

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IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B



LEGEND		ENVIRONMENTAL CONSTRAINTS		WETLAND AND WATER BODY PERMANENCE	
	CADASTRAL		AREA OF FOOTPRINT INTERACTION/MITIGATION (SEE NOTES)		TEMPORARY (CLASS II) WETLAND
	LOCAL ROAD		WETLAND (CLASS III+) SETBACK (100 m) INTERACTION		SEASONAL (CLASS III) WETLAND
	UNDERGROUND COLLECTOR SYSTEM		WILDLIFE HABITAT FEATURES		ANTHROPOGENIC WATER BODY/MODIFIED NATURAL WETLAND
	CRANE PATH		NEST SETBACK		WOODED DECIDUOUS SWAMP
	CONSTRUCTION FOOTPRINT		ACTIVE		WETLAND (CLASS III+) SETBACK (100 m)
			RAPTOR NEST		WETLAND SETBACK (5 m)



NOTE 1 - Raptor Nest Interactions:
NA

NOTE 2 - Direct Wetland or Ephemeral Waterbody Interactions (Class I, II, III, IV and V):
NA

NOTE 3 - Wetlands within 5 m of the Footprint (Ephemeral waterbodies, drainages, Class II and higher):
NA

NOTE 4 - Within 100 m of a Class III, IV, or V (Amphibians and Waterbirds):
Schedule construction outside of the amphibian active period (i.e., breeding period and post-breeding period to first frost, approximately April 15 to September 15). When construction within 100 m wetlands setbacks with the potential to support amphibian populations cannot be scheduled outside the amphibian active period (April 15 to September 15), a pre-construction amphibian survey will be conducted. If the pre-construction amphibian survey confirms the presence of amphibians, exclusion fencing will be installed and maintained along the nearest edge of the Project Footprint. An experienced wildlife biologist or qualified environmental monitor will conduct an amphibian salvage program, if required. Nest searches will be performed within the 100 m setback by an experienced wildlife biologist, to identify breeding birds or their nests if construction is scheduled between April 1 and August 28. If breeding activity is identified, an appropriate setback buffer will be applied.

NOTE 5 - Direct Wetland Interactions - Class IV Collector Line Crossings:
NA

GENERAL NOTE - All non cultivated areas within 100 m of construction activities:
Schedule construction outside of recommended restricted activity periods (April 1 to August 28) within all non-cultivated habitats. If construction activities occur between April 1 and August 28, non-intrusive, pre-construction nest surveys will be performed an experienced wildlife biologist within 100 m of construction activity prior to construction. If breeding activity is identified, a minimum setback buffer of 100 m will be applied to the suspected nest location until young fledge to minimize the risk of disturbing birds, nests, or eggs. When there is potential for construction activities to pose an elevated risk to wildlife, an experienced wildlife biologist will be on site to monitor wildlife behaviour and to propose on site mitigation actions that should be implemented to reduce risk to wildlife.

GENERAL NOTE - Vegetation Clearing:
Vegetation clearing will be limited to the Project Footprint and the smallest area practicable. Where possible, short shrub species will be "walked down" or simply driven over to preserve the growth crown and root network, thereby enhancing regeneration after construction is complete. Plan vegetation clearing in all non-cultivated habitats outside of the restricted activity period (April 1 - August 28) to the extent possible (refer to General Note - all non-cultivated areas within 100 m of construction activities).

GENERAL NOTE - Clutroot and Weeds:
All vehicles and construction equipment will be clean (i.e., free of soils and vegetative debris) and disinfected (and documented) prior to arrival at the Project area and cleaned prior to leaving the Project area. All vehicles and equipment will be physically cleaned to remove soil and crop debris before traversing between fields as identified by the land agent or Environmental Monitor. Choose low traffic grassy areas near the field exit to complete cleaning when possible. Remove soil and crop debris by knocking or scraping off soil lumps and sweeping loose soil and vegetation from all equipment, vehicles, or tools used during project activities. Compressed air can be used to blow off any residue left on the machinery after scraping. A pressure washer should be used to remove soil and vegetation if the equipment was operated during wet conditions. Salvaged soil materials will not be moved between different sites. Areas that exhibit extensive weed infestations prior to disturbance will have soils salvaged and stockpiled separately to prevent the contamination of larger reclamation soil volumes.

GENERAL NOTE - Turbine Foundation:
Mortality due to foundation construction activities, while not expected, may occur if wildlife falls into or becomes trapped within foundation excavations. To prevent wildlife from inadvertently falling in, open excavations or auger holes will be temporarily fenced off. Open excavations or auger holes left unsupervised will be checked daily to ensure no wildlife is trapped.

Category	Applicability	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
Raptor Nest Breeding Period	Raptor Nests and Setbacks			Wildlife Monitor Required when working in Setback									
				15-Mar				15-Jul					
Grassland Breeding Bird Nesting Period (April 1- July 15) and Migratory Bird Nesting Period, Nesting Zone B4 (April 14 - August 28)	All non cultivated areas within 100 m of construction activity.			Nest Sweep Required									
					1-Apr				28-Aug				
Amphibian Active Period (April 15 - September 15)	Direct impacts to Class III, IV and V wetlands, or work within 100 m setbacks of Class III, IV and V wetlands				Pre-Construction Amphibian Survey, Silt Fencing and Amphibian Monitoring Required as per Referral Report*		Pre-Construction Amphibian Survey, Silt Fencing and Amphibian Monitoring Recommended*						
					15-Apr		14-Jun			15-Sep			

*It is recommended that best practices for amphibian mitigation are applied during the frost-free season from about April to September 15.

REFERENCE(S)
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2. 2018 ORTHOPHOTO OBTAINED FROM TARIN RESOURCE SERVICES LTD.

PROJECTION: UTM ZONE 12 DATUM: NAD 83



CLIENT **Capital Power**

PROJECT **HALKIRK 2 WIND POWER PROJECT**

TITLE **QUARTER SECTION: SE 9-40-14 W4M**

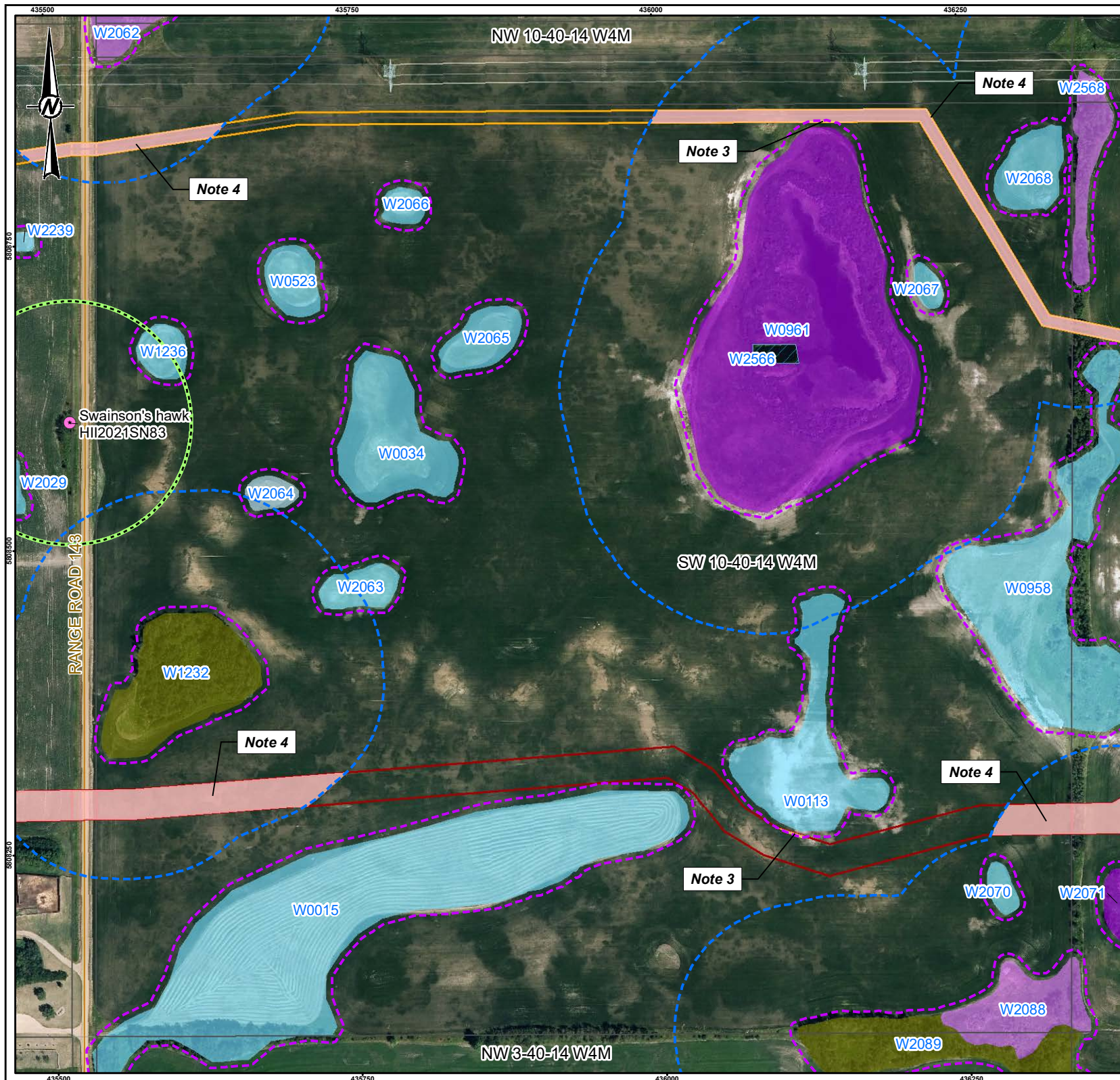
CONSULTANT

YYYY-MM-DD	2023-09-15
DESIGNED	SC
PREPARED	LB
REVIEWED	SC
APPROVED	SC

PROJECT NO. 21452763 PHASE APPROVED REV. 0 FIGURE 38

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IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B



NOTE 1 - Raptor Nest Interactions:
NA

NOTE 2 - Direct Wetland or Ephemeral Waterbody Interactions (Class I, II, III, IV and V):
NA

NOTE 3 - Wetlands within 5 m of the Footprint (Ephemeral waterbodies, drainages, Class II and higher):
Wetlands, ephemeral water bodies and drainages within 5 m of the Project Footprint will be marked prior to construction. Silt fencing will be installed between the wetland and the nearest edge of the Project Footprint if construction cannot be scheduled during dry or frozen conditions. The Environmental Monitor may require additional silt fencing as required based on site conditions. Alternatively, the Environmental Monitor may determine silt fencing is not needed based on the distance of the wettest edge to the Project Footprint.

NOTE 4 - Within 100 m of a Class III, IV, or V (Amphibians and Waterbirds):
Schedule construction outside of the amphibian active period (i.e., breeding period and post-breeding period to first frost, approximately April 15 to September 15). When construction within 100 m wetlands setbacks with the potential to support amphibian populations cannot be scheduled outside the amphibian active period (April 15 to September 15), a pre-construction amphibian survey will be conducted. If the pre-construction amphibian survey confirms the presence of amphibians, exclusion fencing will be installed and maintained along the nearest edge of the Project Footprint. An experienced wildlife biologist or qualified environmental monitor will conduct an amphibian salvage program, if required. Nest searches will be performed within the 100 m setback by an experienced wildlife biologist, to identify breeding birds or their nests if construction is scheduled between April 1 and August 28. If breeding activity is identified, an appropriate setback buffer will be applied.

NOTE 5 - Direct Wetland Interactions - Class IV Collector Line Crossings:
NA

GENERAL NOTE - All non cultivated areas within 100 m of construction activities:
Schedule construction outside of recommended restricted activity periods (April 1 to August 28) within all non-cultivated habitats. If construction activities occur between April 1 and August 28, non-intrusive, pre-construction nest surveys will be performed by an experienced wildlife biologist within 100 m of construction activity prior to construction. If breeding activity is identified, a minimum setback buffer of 100 m will be applied to the suspected nest location until young fledge to minimize the risk of disturbing birds, nests, or eggs. When there is potential for construction activities to pose an elevated risk to wildlife, an experienced wildlife biologist will be on site to monitor wildlife behaviour and to propose on site mitigation actions that should be implemented to reduce risk to wildlife.

GENERAL NOTE - Vegetation Clearing:
Vegetation clearing will be limited to the Project Footprint and the smallest area practicable. Where possible, short shrub species will be "walked down" or simply driven over to preserve the growth crown and root network, thereby enhancing regeneration after construction is complete. Plan vegetation clearing in all non-cultivated habitats outside of the restricted activity period (April 1 – August 28) to the extent possible (refer to General Note – all non-cultivated areas within 100 m of construction activities).

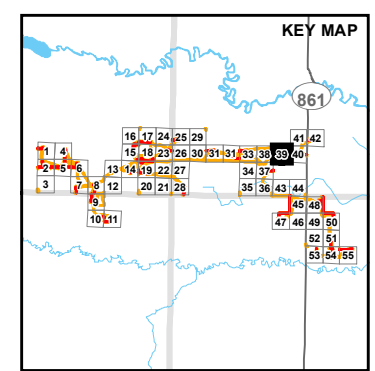
GENERAL NOTE - Clubroot and Weeds:
All vehicles and construction equipment will be clean (i.e., free of soils and vegetative debris) and disinfected (and documented) prior to arrival at the Project area and cleaned prior to leaving the Project area. All vehicles and equipment will be physically cleaned to remove soil and crop debris before traversing between fields as identified by the land agent or Environmental Monitor. Choose low traffic grassy areas near the field exit to complete cleaning when possible. Remove soil and crop debris by knocking or scraping off soil lumps and sweeping loose soil and vegetation from all equipment, vehicles, or tools used during project activities. Compressed air can be used to blow off any residue left on the machinery after scraping. A pressure washer should be used to remove soil and vegetation if the equipment was operated during wet conditions. Salvaged soil materials will not be moved between different sites. Areas that exhibit extensive weed infestations prior to disturbance will have soils salvaged and stockpiled separately to prevent the contamination of larger reclamation soil volumes.

GENERAL NOTE - Turbine Foundation:
Mortality due to foundation construction activities, while not expected, may occur if wildlife falls into or becomes trapped within foundation excavations. To prevent wildlife from inadvertently falling in, open excavations or auger holes will be temporarily fenced off. Open excavations or auger holes left unsupervised will be checked daily to ensure no wildlife is trapped.

Category	Applicability	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
Raptor Nest Breeding Period	Raptor Nests and Setbacks			Wildlife Monitor Required when working in Setback									
				15-Mar				15-Jul					
Grassland Breeding Bird Nesting Period (April 1- July 15) and Migratory Bird Nesting Period, Nesting Zone B4 (April 14 - August 28)	All non cultivated areas within 100 m of construction activity.			Nest Sweep Required									
					1-Apr				28-Aug				
Amphibian Active Period (April 15 - September 15)	Direct impacts to Class III, IV and V wetlands, or work within 100 m setbacks of Class III, IV and V wetlands				Pre-Construction Amphibian Survey, Silt Fencing and Amphibian Monitoring Required as per Referral Report*			Pre-Construction Amphibian Survey, Silt Fencing and Amphibian Monitoring Recommended*					
					15-Apr	14-Jun				15-Sep			

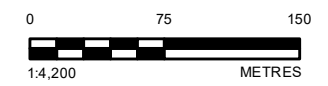
*It is recommended that best practices for amphibian mitigation are applied during the frost-free season from about April to September 15.

- LEGEND**
- CADASTRAL
 - LOCAL ROAD
 - UNDERGROUND COLLECTOR SYSTEM
 - CRANE PATH
 - CONSTRUCTION FOOTPRINT
- ENVIRONMENTAL CONSTRAINTS**
- AREA OF FOOTPRINT INTERACTION/MITIGATION (SEE NOTES)
 - WETLAND SETBACK (5 m) INTERACTION (Silt fencing between the Project Footprint and wetland when work cannot be scheduled during dry or frozen periods.)
 - WETLAND (CLASS III+) SETBACK (100 m) INTERACTION
 - WILDLIFE HABITAT FEATURES**
 - NEST SETBACK
 - ACTIVE
 - RAPTOR NEST
- WETLAND AND WATER BODY PERMANENCE**
- EPHEMERAL (CLASS I) WATER BODY
 - TEMPORARY (CLASS II) WETLAND
 - SEASONAL (CLASS III) WETLAND
 - SEMI-PERMANENT (CLASS IV) WETLAND
 - ANTHROPOGENIC WATER BODY/MODIFIED NATURAL WETLAND
 - WOODED DECIDUOUS SWAMP
 - WETLAND (CLASS III+) SETBACK (100 m)
 - WETLAND SETBACK (5 m)



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2. 2018 ORTHOPHOTO OBTAINED FROM TARIN RESOURCE SERVICES LTD.

PROJECTION: UTM ZONE 12 DATUM: NAD 83



CLIENT **Capital Power**

PROJECT **HALKIRK 2 WIND POWER PROJECT**

TITLE **QUARTER SECTION: SW 10-40-14 W4M**

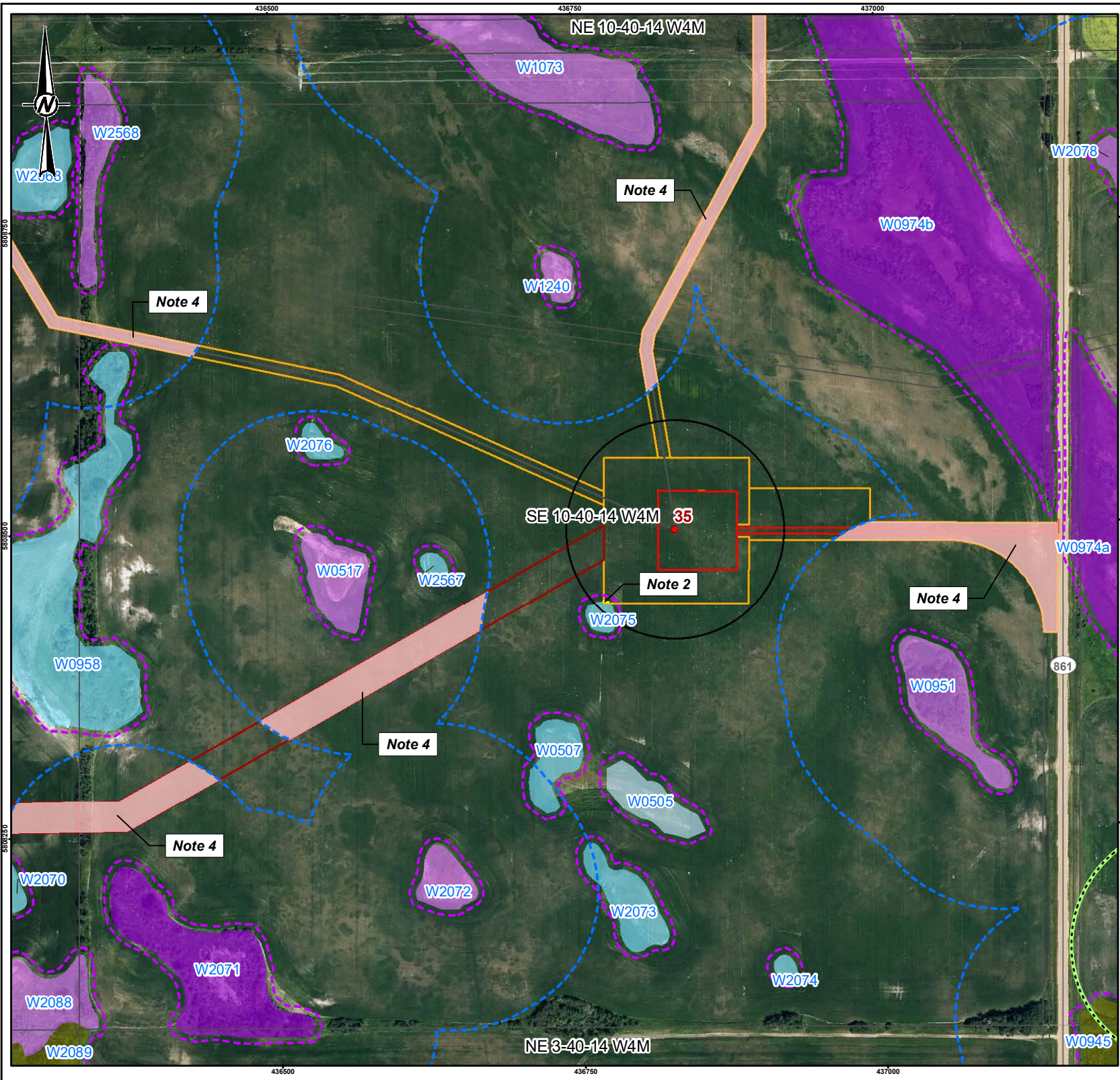
CONSULTANT **wsp**

PROJECT NO.	PHASE	REV.	FIGURE
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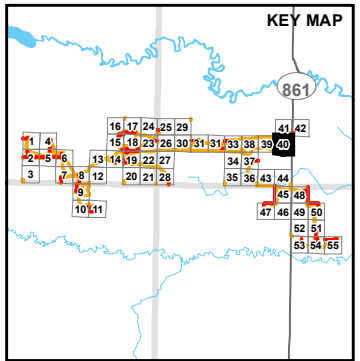
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PREPARED LB
REVIEWED SC
APPROVED SC

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IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B



LEGEND		ENVIRONMENTAL CONSTRAINTS		WETLAND AND WATER BODY PERMANENCE	
—	CADASTRAL		AREA OF FOOTPRINT INTERACTION/MITIGATION (SEE NOTES)		EPHEMERAL (CLASS I) WATER BODY
—	SECONDARY HIGHWAY		WETLAND (CLASS III+) SETBACK (100 m) INTERACTION		TEMPORARY (CLASS II) WETLAND
●	TURBINE		WILDLIFE HABITAT FEATURES		SEASONAL (CLASS III) WETLAND
—	ROTOR-SWEPT AREA		NEST SETBACK		SEMI-PERMANENT (CLASS IV) WETLAND
—	UNDERGROUND COLLECTOR SYSTEM				WOODED DECIDUOUS SWAMP
—	CRANE PATH				WETLAND (CLASS III+) SETBACK (100 m)
—	OPERATION FOOTPRINT				WETLAND SETBACK (5 m)
—	CONSTRUCTION FOOTPRINT				



NOTE 1 - Raptor Nest Interactions:
NA

NOTE 2 - Direct Wetland or Ephemeral Waterbody Interactions (Class I, II, III, IV and V):
Direct impacts to wetlands can not extend beyond the Project Footprint and as outlined in this plan. Wetland boundaries between the Project footprint and wetland will be marked before construction start, and silt fencing will be installed to prevent vehicle traffic from entering wetlands that extend outside of the footprint when work cannot be scheduled under dry or frozen conditions. Plan construction during dry ground conditions to the extent possible, and use rig matting, geotextiles, vegetated buffer zones, earthen berms as appropriate. Wetlands temporarily disturbed will naturally regenerate from seeds present in the soil and from adjacent areas. Plan construction outside of the sensitive amphibian breeding period or implement mitigations for amphibians when intersecting Class III, IV or V (Refer to Note 4).

NOTE 3 - Wetlands within 5 m of the Footprint (Ephemeral waterbodies, drainages, Class II and higher):
NA

NOTE 4 - Within 100 m of a Class III, IV, or V (Amphibians and Waterbirds):
Schedule construction outside of the amphibian active period (i.e., breeding period and post-breeding period to first frost, approximately April 15 to September 15). When construction within 100 m wetlands setbacks with the potential to support amphibian populations cannot be scheduled outside the amphibian active period (April 15 to September 15), a pre-construction amphibian survey will be conducted. If the pre-construction amphibian survey confirms the presence of amphibians, exclusion fencing will be installed and maintained along the nearest edge of the Project Footprint. An experienced wildlife biologist or qualified environmental monitor will conduct an amphibian salvage program, if required. Nest searches will be performed within the 100 m setback by an experienced wildlife biologist, to identify breeding birds or their nests if construction is scheduled between April 1 and August 28. If breeding activity is identified, an appropriate setback buffer will be applied.

NOTE 5 - Direct Wetland Interactions - Class IV Collector Line Crossings:
NA

GENERAL NOTE - All non cultivated areas within 100 m of construction activities:
Schedule construction outside of recommended restricted activity periods (April 1 to August 28) within all non-cultivated habitats. If construction activities occur between April 1 and August 28, non-intrusive, pre-construction nest surveys will be performed an experienced wildlife biologist within 100 m of construction activity prior to construction. If breeding activity is identified, a minimum setback buffer of 100 m will be applied to the suspected nest location until young fledge to minimize the risk of disturbing birds, nests, or eggs. When there is potential for construction activities to pose an elevated risk to wildlife, an experienced wildlife biologist will be on site to monitor wildlife behaviour and to propose on site mitigation actions that should be implemented to reduce risk to wildlife.

GENERAL NOTE - Vegetation Clearing:
Vegetation clearing will be limited to the Project Footprint and the smallest area practicable. Where possible, short shrub species will be "walked down" or simply driven over to preserve the growth crown and root network, thereby enhancing regeneration after construction is complete. Plan vegetation clearing in all non-cultivated habitats outside of the restricted activity period (April 1 – August 28) to the extent possible (refer to General Note – all non-cultivated areas within 100 m of construction activities).

GENERAL NOTE - Clubroot and Weeds:
All vehicles and construction equipment will be clean (i.e., free of soils and vegetative debris) and disinfected (and documented) prior to arrival at the Project area and cleaned prior to leaving the Project area. All vehicles and equipment will be physically cleaned to remove soil and crop debris before traversing between fields as identified by the land agent or Environmental Monitor. Choose low traffic grassy areas near the field exit to complete cleaning when possible. Remove soil and crop debris by knocking or scraping off soil lumps and sweeping loose soil and vegetation from all equipment, vehicles, or tools used during project activities. Compressed air can be used to blow off any residue left on the machinery after scraping. A pressure washer should be used to remove soil and vegetation if the equipment was operated during wet conditions. Salvaged soil materials will not be moved between different sites. Areas that exhibit extensive weed infestations prior to disturbance will have soils salvaged and stockpiled separately to prevent the contamination of larger reclamation soil volumes.

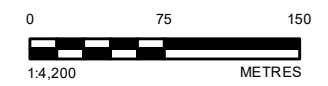
GENERAL NOTE - Turbine Foundation:
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Category	Applicability	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
Raptor Nest Breeding Period	Raptor Nests and Setbacks			Wildlife Monitor Required when working in Setback									
				15-Mar				15-Jul					
Grassland Breeding Bird Nesting Period (April 1- July 15) and Migratory Bird Nesting Period, Nesting Zone B4 (April 14 - August 28)	All non cultivated areas within 100 m of construction activity.			Nest Sweep Required									
					1-Apr				28-Aug				
Amphibian Active Period (April 15 - September 15)	Direct impacts to Class III, IV and V wetlands, or work within 100 m setbacks of Class III, IV and V wetlands				Pre-Construction Amphibian Survey, Silt Fencing and Amphibian Monitoring Required as per Referral Report*			Pre-Construction Amphibian Survey, Silt Fencing and Amphibian Monitoring Recommended*					
					15-Apr		14-Jun			15-Sep			

*It is recommended that best practices for amphibian mitigation are applied during the frost-free season from about April to September 15.

REFERENCE(S)
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2. 2018 ORTHOPHOTO OBTAINED FROM TARIN RESOURCE SERVICES LTD.

PROJECTION: UTM ZONE 12 DATUM: NAD 83



CLIENT **Capital Power**

PROJECT **HALKIRK 2 WIND POWER PROJECT**

TITLE **QUARTER SECTION: SE 10-40-14 W4M**

CONSULTANT **wsp**

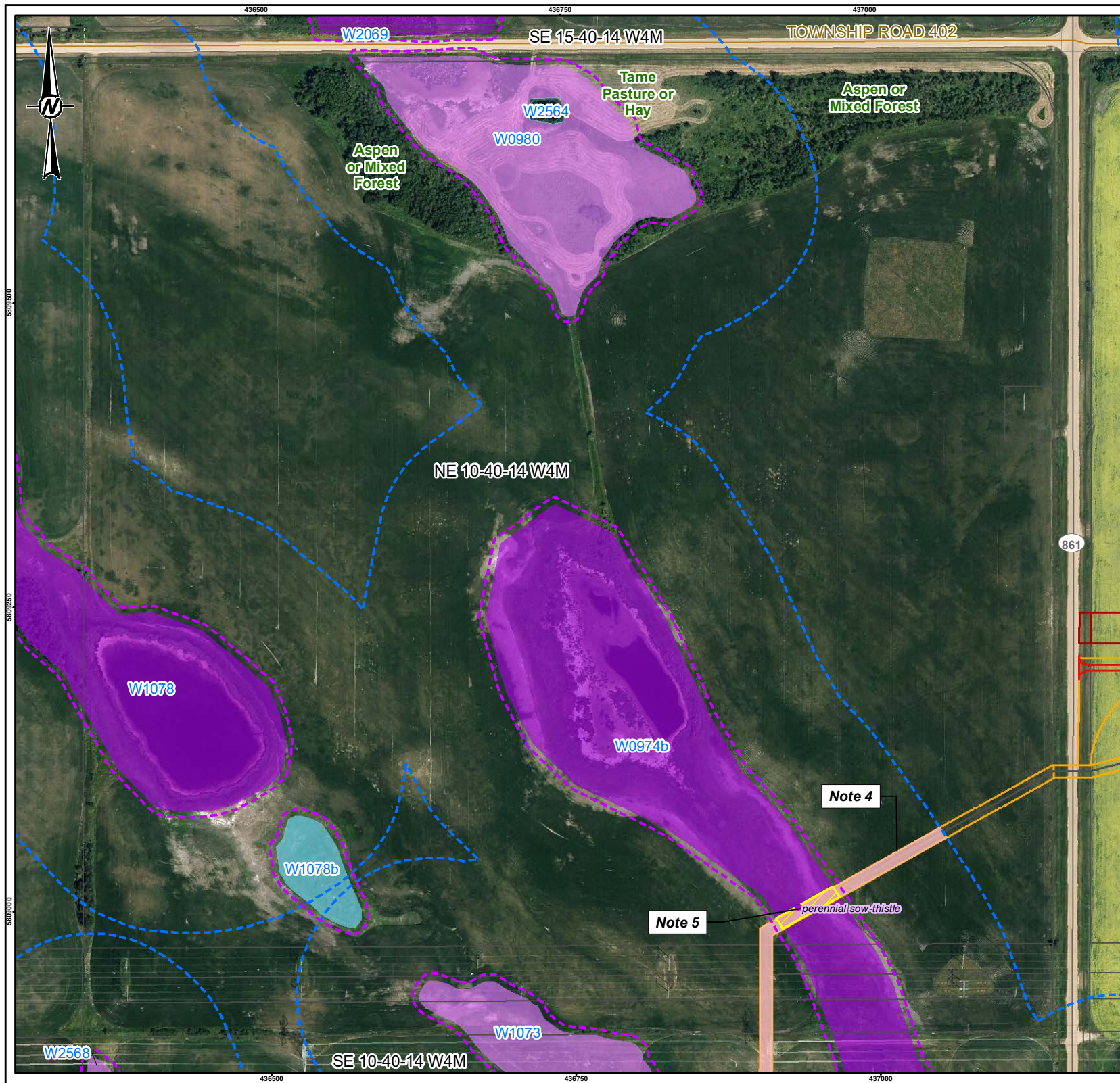
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PROJECT NO. 21452763 PHASE 0 REV. 0

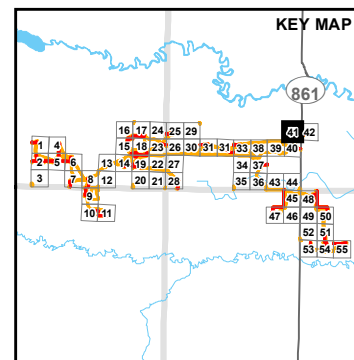
FIGURE 40

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IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B



LEGEND		ENVIRONMENTAL CONSTRAINTS		WETLAND AND WATER BODY PERMANENCE		WEED OBSERVATION	
—	CADASTRAL		AREA OF FOOTPRINT INTERACTION/MITIGATION (SEE NOTES)		TEMPORARY (CLASS II) WETLAND		NOXIOUS WEED SPECIES OBSERVATION
—	SECONDARY HIGHWAY		WETLAND (CLASS III+) SETBACK (100 m) INTERACTION		SEASONAL (CLASS III) WETLAND		
—	LOCAL ROAD				SEMI-PERMANENT (CLASS IV) WETLAND		
—	UNDERGROUND COLLECTOR SYSTEM				ANTHROPOGENIC WATER BODY/MODIFIED NATURAL WETLAND		
	CRANE PATH				WETLAND (CLASS III+) SETBACK (100 m)		
	OPERATION FOOTPRINT				WETLAND SETBACK (5 m)		
	CONSTRUCTION FOOTPRINT						



NOTE 1 - Raptor Nest Interactions:

NA

NOTE 2 - Direct Wetland or Ephemeral Waterbody Interactions (Class I, II, III, IV and V):

Direct impacts to wetlands can not extend beyond the Project Footprint and as outlined in this plan. Wetland boundaries between the Project footprint and wetland will be marked before construction start, and silt fencing will be installed to prevent vehicle traffic from entering wetlands that extend outside of the footprint when work cannot be scheduled under dry or frozen conditions. Plan construction during dry ground conditions to the extent possible, and use rig matting, geotextiles, vegetated buffer zones, earthen berms as appropriate. Wetlands temporarily disturbed will naturally regenerate from seeds present in the soil and from adjacent areas. Plan construction outside of the sensitive amphibian breeding period or implement mitigations for amphibians when intersecting Class III, IV or V (Refer to Note 4).

NOTE 3 - Wetlands within 5 m of the Footprint (Ephemeral waterbodies, drainages, Class II and higher):

NA

NOTE 4 - Within 100 m of a Class III, IV, or V (Amphibians and Waterbirds):

Schedule construction outside of the amphibian active period (i.e., breeding period and post-breeding period to first frost, approximately April 15 to September 15). When construction within 100 m wetlands setbacks with the potential to support amphibian populations cannot be scheduled outside the amphibian active period (April 15 to September 15), a pre-construction amphibian survey will be conducted. If the pre-construction amphibian survey confirms the presence of amphibians, exclusion fencing will be installed and maintained along the nearest edge of the Project Footprint. An experienced wildlife biologist or qualified environmental monitor will conduct an amphibian salvage program, if required. Nest searches will be performed within the 100 m setback by an experienced wildlife biologist, to identify breeding birds or their nests if construction is scheduled between April 1 and August 28. If breeding activity is identified, an appropriate setback buffer will be applied.

NOTE 5 - Direct Wetland Interactions - Class IV Collector Line Crossings:

Class IV wetlands that interact with collector lines will be horizontally directionally drilled (HDD). No direct disturbance to Class IV wetlands has been permitted. An HDD frac out plan will be available from the EPC contractor. Silt fencing will be installed between the wetland and the nearest edge of the Project Footprint if construction cannot be scheduled during dry or frozen conditions.

GENERAL NOTE - All non cultivated areas within 100 m of construction activities:

Schedule construction outside of recommended restricted activity periods (April 1 to August 28) within all non-cultivated habitats. If construction activities occur between April 1 and August 28, non-intrusive, pre-construction nest surveys will be performed an experienced wildlife biologist within 100 m of construction activity prior to construction. If breeding activity is identified, a minimum setback buffer of 100 m will be applied to the suspected nest location until young fledge to minimize the risk of disturbing birds, nests, or eggs. When there is potential for construction activities to pose an elevated risk to wildlife, an experienced wildlife biologist will be on site to monitor wildlife behaviour and to propose on site mitigation actions that should be implemented to reduce risk to wildlife.

GENERAL NOTE - Vegetation Clearing:

Vegetation clearing will be limited to the Project Footprint and the smallest area practicable. Where possible, short shrub species will be "walked down" or simply driven over to preserve the growth crown and root network, thereby enhancing regeneration after construction is complete. Plan vegetation clearing in all non-cultivated habitats outside of the restricted activity period (April 1 – August 28) to the extent possible (refer to General Note – all non-cultivated areas within 100 m of construction activities).

GENERAL NOTE - Clubroot and Weeds:

All vehicles and construction equipment will be clean (i.e., free of soils and vegetative debris) and disinfected (and documented) prior to arrival at the Project area and cleaned prior to leaving the Project area. All vehicles and equipment will be physically cleaned to remove soil and crop debris before traversing between fields as identified by the land agent or Environmental Monitor. Choose low traffic grassy areas near the field exit to complete cleaning when possible. Remove soil and crop debris by knocking or scraping off soil lumps and sweeping loose soil and vegetation from all equipment, vehicles, or tools used during project activities. Compressed air can be used to blow off any residue left on the machinery after scraping. A pressure washer should be used to remove soil and vegetation if the equipment was operated during wet conditions. Salvaged soil materials will not be moved between different sites. Areas that exhibit extensive weed infestations prior to disturbance will have soils salvaged and stockpiled separately to prevent the contamination of larger reclamation soil volumes.

GENERAL NOTE - Turbine Foundation:

Mortality due to foundation construction activities, while not expected, may occur if wildlife falls into or becomes trapped within foundation excavations. To prevent wildlife from inadvertently falling in, open excavations or auger holes will be temporarily fenced off. Open excavations or auger holes left unsupervised will be checked daily to ensure no wildlife is trapped.

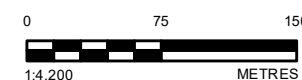
Category	Applicability	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
Raptor Nest Breeding Period	Raptor Nests and Setbacks			Wildlife Monitor Required when working in Setback									
				15-Mar				15-Jul					
Grassland Breeding Bird Nesting Period (April 1- July 15) and Migratory Bird Nesting Period, Nesting Zone B4 (April 14 - August 28)	All non cultivated areas within 100 m of construction activity.			Nest Sweep Required									
					1-Apr				28-Aug				
Amphibian Active Period (April 15 - September 15)	Direct impacts to Class III, IV and V wetlands, or work within 100 m setbacks of Class III, IV and V wetlands				Pre-Construction Amphibian Survey, Silt Fencing and Amphibian Monitoring Required as per Referral Report*		Pre-Construction Amphibian Survey, Silt Fencing and Amphibian Monitoring Recommended*						
					15-Apr		14-Jun			15-Sep			

*It is recommended that best practices for amphibian mitigation are applied during the frost-free season from about April to September 15.

REFERENCE(S)

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2. 2018 ORTHOPHOTO OBTAINED FROM TARIN RESOURCE SERVICES LTD.

PROJECTION: UTM ZONE 12 DATUM: NAD 83



CLIENT **Capital Power**

PROJECT **HALKIRK 2 WIND POWER PROJECT**

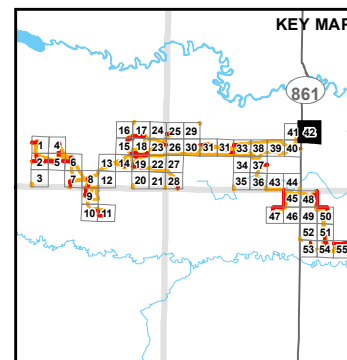
TITLE **QUARTER SECTION: NE 10-40-14 W4M**

CONSULTANT	YYYY-MM-DD	2023-09-15
DESIGNED	SC	
PREPARED	LB	
REVIEWED	SC	
APPROVED	SC	

PROJECT NO. 21452763 PHASE REV. 0 FIGURE 41



- LEGEND**
- CADASTRAL
 - SECONDARY HIGHWAY
 - LOCAL ROAD
 - PROJECT LAYOUT**
 - TURBINE
 - ROTOR-SWEPT AREA
 - UNDERGROUND COLLECTOR SYSTEM
 - CRANE PATH
 - OPERATION FOOTPRINT
 - CONSTRUCTION FOOTPRINT
- ENVIRONMENTAL CONSTRAINTS**
- AREA OF FOOTPRINT INTERACTION/MITIGATION (SEE NOTES)
- WETLAND AND WATER BODY PERMANENCE**
- SEASONAL (CLASS III) WETLAND
 - WETLAND (CLASS III+) SETBACK (100 m)
 - WETLAND SETBACK (5 m)



NOTE 1 - Raptor Nest Interactions:

NA

NOTE 2 - Direct Wetland or Ephemeral Waterbody Interactions (Class I, II, III, IV and V):

NA

NOTE 3 - Wetlands within 5 m of the Footprint (Ephemeral waterbodies, drainages, Class II and higher):

NA

NOTE 4 - Within 100 m of a Class III, IV, or V (Amphibians and Waterbirds):

NA

NOTE 5 - Direct Wetland Interactions - Class IV Collector Line Crossings:

NA

GENERAL NOTE - All non cultivated areas within 100 m of construction activities:

Schedule construction outside of recommended restricted activity periods (April 1 to August 28) within all non-cultivated habitats. If construction activities occur between April 1 and August 28, non-intrusive, pre-construction nest surveys will be performed by an experienced wildlife biologist within 100 m of construction activity prior to construction. If breeding activity is identified, a minimum setback buffer of 100 m will be applied to the suspected nest location until young fledge to minimize the risk of disturbing birds, nests, or eggs. When there is potential for construction activities to pose an elevated risk to wildlife, an experienced wildlife biologist will be on site to monitor wildlife behaviour and to propose on site mitigation actions that should be implemented to reduce risk to wildlife.

GENERAL NOTE - Vegetation Clearing:

Vegetation clearing will be limited to the Project Footprint and the smallest area practicable. Where possible, short shrub species will be "walked down" or simply driven over to preserve the growth crown and root network, thereby enhancing regeneration after construction is complete. Plan vegetation clearing in all non-cultivated habitats outside of the restricted activity period (April 1 – August 28) to the extent possible (refer to General Note – all non-cultivated areas within 100 m of construction activities).

GENERAL NOTE - Clubroot and Weeds:

All vehicles and construction equipment will be clean (i.e., free of soils and vegetative debris) and disinfected (and documented) prior to arrival at the Project area and cleaned prior to leaving the Project area. All vehicles and equipment will be physically cleaned to remove soil and crop debris before traversing between fields as identified by the land agent or Environmental Monitor. Choose low traffic grassy areas near the field exit to complete cleaning when possible. Remove soil and crop debris by knocking or scraping off soil lumps and sweeping loose soil and vegetation from all equipment, vehicles, or tools used during project activities. Compressed air can be used to blow off any residue left on the machinery after scraping. A pressure washer should be used to remove soil and vegetation if the equipment was operated during wet conditions. Salvaged soil materials will not be moved between different sites. Areas that exhibit extensive weed infestations prior to disturbance will have soils salvaged and stockpiled separately to prevent the contamination of larger reclamation soil volumes.

GENERAL NOTE - Turbine Foundation:

Mortality due to foundation construction activities, while not expected, may occur if wildlife falls into or becomes trapped within foundation excavations. To prevent wildlife from inadvertently falling in, open excavations or auger holes will be temporarily fenced off. Open excavations or auger holes left unsupervised will be checked daily to ensure no wildlife is trapped.

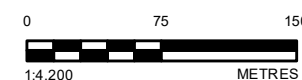
Category	Applicability	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
Raptor Nest Breeding Period	Raptor Nests and Setbacks			Wildlife Monitor Required when working in Setback 15-Mar				15-Jul					
Grassland Breeding Bird Nesting Period (April 1- July 15) and Migratory Bird Nesting Period, Nesting Zone B4 (April 14 - August 28)	All non cultivated areas within 100 m of construction activity.				Nest Sweep Required								
Amphibian Active Period (April 15 - September 15)	Direct impacts to Class III, IV and V wetlands, or work within 100 m setbacks of Class III, IV and V wetlands				1-Apr Pre-Construction Amphibian Survey, Silt Fencing and Amphibian Monitoring Required as per Referral Report*				28-Aug Pre-Construction Amphibian Survey, Silt Fencing and Amphibian Monitoring Recommended*				
					15-Apr		14-Jun			15-Sep			

*It is recommended that best practices for amphibian mitigation are applied during the frost-free season from about April to September 15.

REFERENCE(S)

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- 2018 ORTHOPHOTO OBTAINED FROM TARIN RESOURCE SERVICES LTD.

PROJECTION: UTM ZONE 12 DATUM: NAD 83



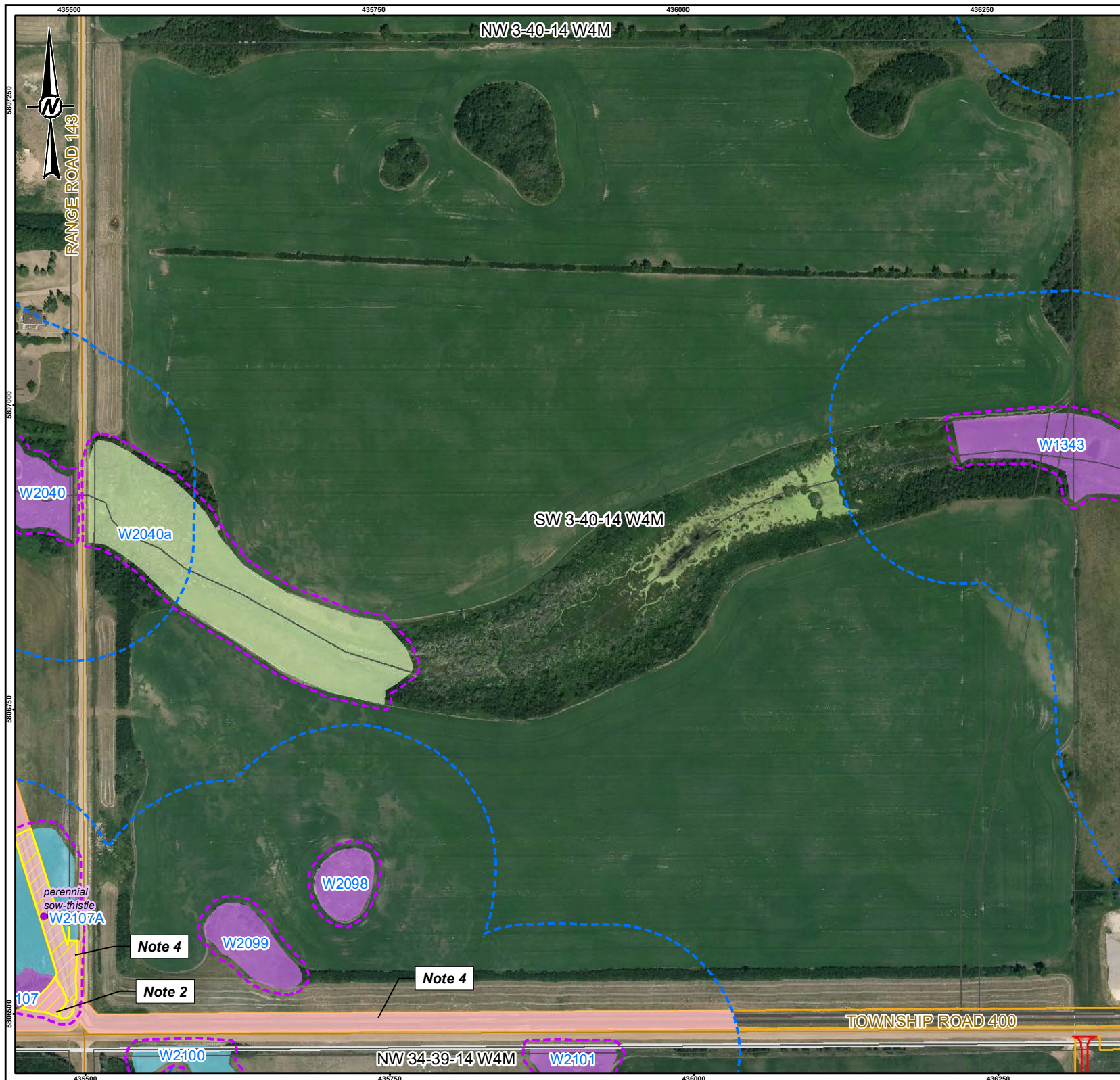
CLIENT
Capital Power

PROJECT
HALKIRK 2 WIND POWER PROJECT

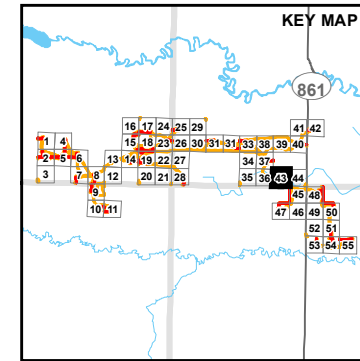
TITLE
QUARTER SECTION: NW 11-40-14 W4M

CONSULTANT	YYYY-MM-DD	2023-09-15
DESIGNED	SC	
PREPARED	LB	
REVIEWED	SC	
APPROVED	SC	

PROJECT NO. 21452763 PHASE REV. 0 FIGURE 42



LEGEND		ENVIRONMENTAL CONSTRAINTS		WETLAND AND WATER BODY PERMANENCE		WEED OBSERVATION	
	CADASTRAL		AREA OF FOOTPRINT INTERACTION/MITIGATION (SEE NOTES)		TEMPORARY (CLASS II) WETLAND		NOXIOUS WEED SPECIES OBSERVATION
	LOCAL ROAD		WETLAND (CLASS III+) SETBACK (100 m) INTERACTION		SEASONAL (CLASS III) WETLAND		
	UNDERGROUND COLLECTOR SYSTEM				NATURAL DRAINAGE		
	OPERATION FOOTPRINT				WETLAND (CLASS III+) SETBACK (100 m)		
	CONSTRUCTION FOOTPRINT				WETLAND SETBACK (5 m)		



NOTE 1 - Raptor Nest Interactions:
NA

NOTE 2 - Direct Wetland or Ephemeral Waterbody Interactions (Class I, II, III, IV and V):
Direct impacts to wetlands can not extend beyond the Project Footprint and as outlined in this plan. Wetland boundaries between the Project footprint and wetland will be marked before construction start, and silt fencing will be installed to prevent vehicle traffic from entering wetlands that extend outside of the footprint when work cannot be scheduled under dry or frozen conditions. Plan construction during dry ground conditions to the extent possible, and use rig matting, geotextiles, vegetated buffer zones, earthen berms as appropriate. Wetlands temporarily disturbed will naturally regenerate from seeds present in the soil and from adjacent areas. Plan construction outside of the sensitive amphibian breeding period or implement mitigations for amphibians when intersecting Class III, IV or V (Refer to Note 4).

NOTE 3 - Wetlands within 5 m of the Footprint (Ephemeral waterbodies, drainages, Class II and higher):
NA

NOTE 4 - Within 100 m of a Class III, IV, or V (Amphibians and Waterbirds):
Schedule construction outside of the amphibian active period (i.e., breeding period and post-breeding period to first frost, approximately April 15 to September 15). When construction within 100 m wetlands setbacks with the potential to support amphibian populations cannot be scheduled outside the amphibian active period (April 15 to September 15), a pre-construction amphibian survey will be conducted. If the pre-construction amphibian survey confirms the presence of amphibians, exclusion fencing will be installed and maintained along the nearest edge of the Project Footprint. An experienced wildlife biologist or qualified environmental monitor will conduct an amphibian salvage program, if required. Nest searches will be performed within the 100 m setback by an experienced wildlife biologist, to identify breeding birds or their nests if construction is scheduled between April 1 and August 28. If breeding activity is identified, an appropriate setback buffer will be applied.

NOTE 5 - Direct Wetland Interactions - Class IV Collector Line Crossings:
NA

GENERAL NOTE - All non cultivated areas within 100 m of construction activities:
Schedule construction outside of recommended restricted activity periods (April 1 to August 28) within all non-cultivated habitats. If construction activities occur between April 1 and August 28, non-intrusive, pre-construction nest surveys will be performed an experienced wildlife biologist within 100 m of construction activity prior to construction. If breeding activity is identified, a minimum setback buffer of 100 m will be applied to the suspected nest location until young fledge to minimize the risk of disturbing birds, nests, or eggs. When there is potential for construction activities to pose an elevated risk to wildlife, an experienced wildlife biologist will be on site to monitor wildlife behaviour and to propose on site mitigation actions that should be implemented to reduce risk to wildlife.

GENERAL NOTE - Vegetation Clearing:
Vegetation clearing will be limited to the Project Footprint and the smallest area practicable. Where possible, short shrub species will be "walked down" or simply driven over to preserve the growth crown and root network, thereby enhancing regeneration after construction is complete. Plan vegetation clearing in all non-cultivated habitats outside of the restricted activity period (April 1 – August 28) to the extent possible (refer to General Note – all non-cultivated areas within 100 m of construction activities).

GENERAL NOTE - Clubroot and Weeds:
All vehicles and construction equipment will be clean (i.e., free of soils and vegetative debris) and disinfected (and documented) prior to arrival at the Project area and cleaned prior to leaving the Project area. All vehicles and equipment will be physically cleaned to remove soil and crop debris before traversing between fields as identified by the land agent or Environmental Monitor. Choose low traffic grassy areas near the field exit to complete cleaning when possible. Remove soil and crop debris by knocking or scraping off soil lumps and sweeping loose soil and vegetation from all equipment, vehicles, or tools used during project activities. Compressed air can be used to blow off any residue left on the machinery after scraping. A pressure washer should be used to remove soil and vegetation if the equipment was operated during wet conditions. Salvaged soil materials will not be moved between different sites. Areas that exhibit extensive weed infestations prior to disturbance will have soils salvaged and stockpiled separately to prevent the contamination of larger reclamation soil volumes.

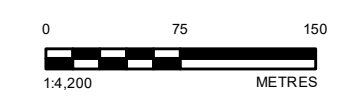
GENERAL NOTE - Turbine Foundation:
Mortality due to foundation construction activities, while not expected, may occur if wildlife falls into or becomes trapped within foundation excavations. To prevent wildlife from inadvertently falling in, open excavations or auger holes will be temporarily fenced off. Open excavations or auger holes left unsupervised will be checked daily to ensure no wildlife is trapped.

Category	Applicability	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
Raptor Nest Breeding Period	Raptor Nests and Setbacks			Wildlife Monitor Required when working in Setback									
				15-Mar				15-Jul					
Grassland Breeding Bird Nesting Period (April 1- July 15) and Migratory Bird Nesting Period, Nesting Zone B4 (April 14 - August 28)	All non cultivated areas within 100 m of construction activity.			Nest Sweep Required									
					1-Apr				28-Aug				
Amphibian Active Period (April 15 - September 15)	Direct impacts to Class III, IV and V wetlands, or work within 100 m setbacks of Class III, IV and V wetlands				Pre-Construction Amphibian Survey, Silt Fencing and Amphibian Monitoring Required as per Referral Report*		Pre-Construction Amphibian Survey, Silt Fencing and Amphibian Monitoring Recommended*						
					15-Apr	14-Jun				15-Sep			

*It is recommended that best practices for amphibian mitigation are applied during the frost-free season from about April to September 15.

REFERENCE(S)
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2. 2018 ORTHOPHOTO OBTAINED FROM TARIN RESOURCE SERVICES LTD.

PROJECTION: UTM ZONE 12 DATUM: NAD 83



CLIENT **Capital Power**

PROJECT **HALKIRK 2 WIND POWER PROJECT**

TITLE **QUARTER SECTION: SW 3-40-14 W4M**

CONSULTANT **wsp**

DESIGNED	SC
PREPARED	LB
REVIEWED	SC
APPROVED	SC

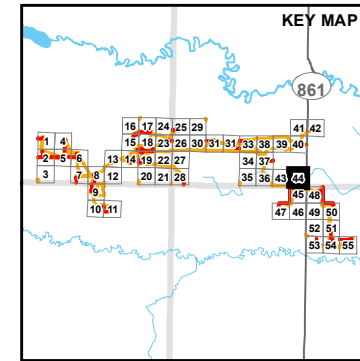
PROJECT NO. 21452763 PHASE REV. 0 FIGURE 43

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IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B



LEGEND		ENVIRONMENTAL CONSTRAINTS		WETLAND AND WATER BODY PERMANENCE	
	CADASTRAL		AREA OF FOOTPRINT INTERACTION/MITIGATION (SEE NOTES)		TEMPORARY (CLASS II) WETLAND
	SECONDARY HIGHWAY				SEASONAL (CLASS III) WETLAND
	LOCAL ROAD				WETLAND (CLASS III+) SETBACK (100 m)
	NATIVE GRASSLAND				WETLAND SETBACK (5 m)
	UNDERGROUND COLLECTOR SYSTEM				
	OPERATION FOOTPRINT				
	CONSTRUCTION FOOTPRINT				



NOTE 1 - Raptor Nest Interactions:
NA

NOTE 2 - Direct Wetland or Ephemeral Waterbody Interactions (Class I, II, III, IV and V):
NA

NOTE 3 - Wetlands within 5 m of the Footprint (Ephemeral waterbodies, drainages, Class II and higher):
NA

NOTE 4 - Within 100 m of a Class III, IV, or V (Amphibians and Waterbirds):
NA

NOTE 5 - Direct Wetland Interactions - Class IV Collector Line Crossings:
NA

GENERAL NOTE - All non cultivated areas within 100 m of construction activities:
Schedule construction outside of recommended restricted activity periods (April 1 to August 28) within all non-cultivated habitats. If construction activities occur between April 1 and August 28, non-intrusive, pre-construction nest surveys will be performed an experienced wildlife biologist within 100 m of construction activity prior to construction. If breeding activity is identified, a minimum setback buffer of 100 m will be applied to the suspected nest location until young fledge to minimize the risk of disturbing birds, nests, or eggs. When there is potential for construction activities to pose an elevated risk to wildlife, an experienced wildlife biologist will be on site to monitor wildlife behaviour and to propose on site mitigation actions that should be implemented to reduce risk to wildlife.

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GENERAL NOTE - Turbine Foundation:
Mortality due to foundation construction activities, while not expected, may occur if wildlife falls into or becomes trapped within foundation excavations. To prevent wildlife from inadvertently falling in, open excavations or auger holes will be temporarily fenced off. Open excavations or auger holes left unsupervised will be checked daily to ensure no wildlife is trapped.

Category	Applicability	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
Raptor Nest Breeding Period	Raptor Nests and Setbacks			Wildlife Monitor Required when working in Setback									
				15-Mar				15-Jul					
Grassland Breeding Bird Nesting Period (April 1- July 15) and Migratory Bird Nesting Period, Nesting Zone B4 (April 14 - August 28)	All non cultivated areas within 100 m of construction activity.			Nest Sweep Required									
					1-Apr				28-Aug				
Amphibian Active Period (April 15 - September 15)	Direct impacts to Class III, IV and V wetlands, or work within 100 m setbacks of Class III, IV and V wetlands				Pre-Construction Amphibian Survey, Silt Fencing and Amphibian Monitoring Required as per Referral Report*		Pre-Construction Amphibian Survey, Silt Fencing and Amphibian Monitoring Recommended*						
					15-Apr	14-Jun				15-Sep			

*It is recommended that best practices for amphibian mitigation are applied during the frost-free season from about April to September 15.

REFERENCE(S)
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2. 2018 ORTHOPHOTO OBTAINED FROM TARIN RESOURCE SERVICES LTD.

PROJECTION: UTM ZONE 12 DATUM: NAD 83



CLIENT **Capital Power**

PROJECT **HALKIRK 2 WIND POWER PROJECT**

TITLE **QUARTER SECTION: SE 3-40-14 W4M**

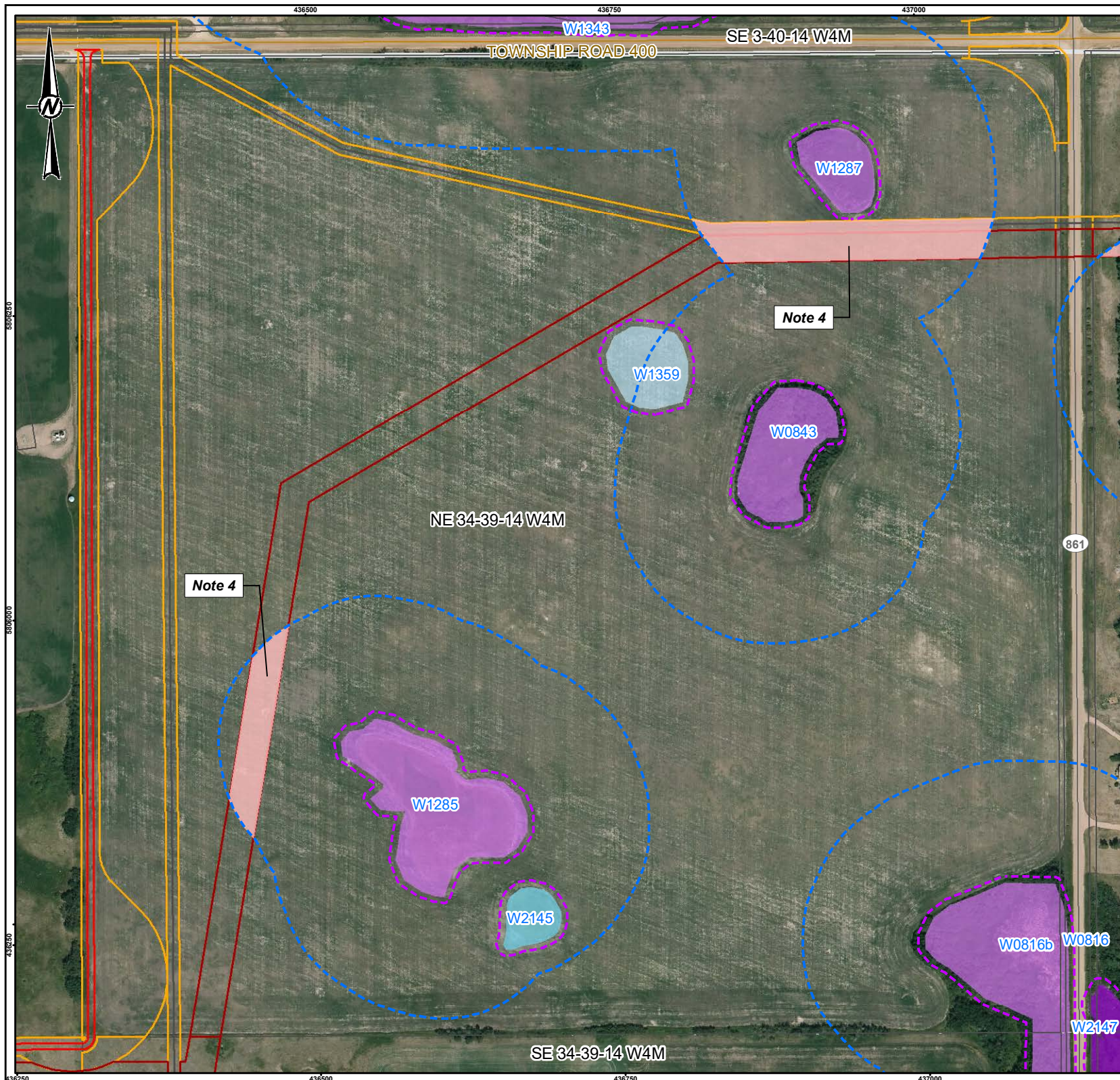
CONSULTANT **wsp**

DESIGNED	SC
PREPARED	LB
REVIEWED	SC
APPROVED	SC

PROJECT NO. 21452763 PHASE REV. 0 FIGURE 44

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IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B



NOTE 1 - Raptor Nest Interactions:
NA

NOTE 2 - Direct Wetland or Ephemeral Waterbody Interactions (Class I, II, III, IV and V):
NA

NOTE 3 - Wetlands within 5 m of the Footprint (Ephemeral waterbodies, drainages, Class II and higher):
NA

NOTE 4 - Within 100 m of a Class III, IV, or V (Amphibians and Waterbirds):
Schedule construction outside of the amphibian active period (i.e., breeding period and post-breeding period to first frost, approximately April 15 to September 15). When construction within 100 m wetlands setbacks with the potential to support amphibian populations cannot be scheduled outside the amphibian active period (April 15 to September 15), a pre-construction amphibian survey will be conducted. If the pre-construction amphibian survey confirms the presence of amphibians, exclusion fencing will be installed and maintained along the nearest edge of the Project Footprint. An experienced wildlife biologist or qualified environmental monitor will conduct an amphibian salvage program, if required. Nest searches will be performed within the 100 m setback by an experienced wildlife biologist, to identify breeding birds or their nests if construction is scheduled between April 1 and August 28. If breeding activity is identified, an appropriate setback buffer will be applied.

NOTE 5 - Direct Wetland Interactions - Class IV Collector Line Crossings:
NA

GENERAL NOTE - All non cultivated areas within 100 m of construction activities:
Schedule construction outside of recommended restricted activity periods (April 1 to August 28) within all non-cultivated habitats. If construction activities occur between April 1 and August 28, non-intrusive, pre-construction nest surveys will be performed by an experienced wildlife biologist within 100 m of construction activity prior to construction. If breeding activity is identified, a minimum setback buffer of 100 m will be applied to the suspected nest location until young fledge to minimize the risk of disturbing birds, nests, or eggs. When there is potential for construction activities to pose an elevated risk to wildlife, an experienced wildlife biologist will be on site to monitor wildlife behaviour and to propose on site mitigation actions that should be implemented to reduce risk to wildlife.

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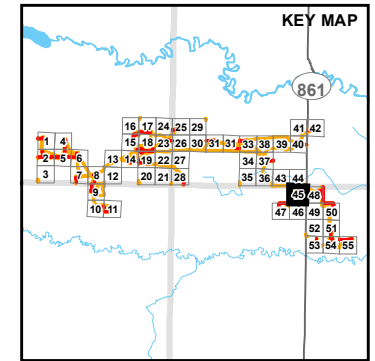
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Category	Applicability	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
Raptor Nest Breeding Period	Raptor Nests and Setbacks			Wildlife Monitor Required when working in Setback 15-Mar				15-Jul					
Grassland Breeding Bird Nesting Period (April 1- July 15) and Migratory Bird Nesting Period, Nesting Zone B4 (April 14 - August 28)	All non cultivated areas within 100 m of construction activity.				Nest Sweep Required								
Amphibian Active Period (April 15 - September 15)	Direct impacts to Class III, IV and V wetlands, or work within 100 m setbacks of Class III, IV and V wetlands				1-Apr				28-Aug				
					Pre-Construction Amphibian Survey, Silt Fencing and Amphibian Monitoring Required as per Referral Report*			Pre-Construction Amphibian Survey, Silt Fencing and Amphibian Monitoring Recommended*					
					15-Apr		14-Jun			15-Sep			

*It is recommended that best practices for amphibian mitigation are applied during the frost-free season from about April to September 15.

- LEGEND**
- CADASTRAL
 - SECONDARY HIGHWAY
 - LOCAL ROAD
 - NATIVE GRASSLAND
 - UNDERGROUND COLLECTOR SYSTEM
 - CRANE PATH
 - OPERATION FOOTPRINT
 - CONSTRUCTION FOOTPRINT
- ENVIRONMENTAL CONSTRAINTS**
- AREA OF FOOTPRINT INTERACTION/MITIGATION (SEE NOTES)
 - WETLAND (CLASS III+) SETBACK (100 m) INTERACTION
- WETLAND AND WATER BODY PERMANENCE**
- EPHEMERAL (CLASS I) WATER BODY
 - TEMPORARY (CLASS II) WETLAND
 - SEASONAL (CLASS III) WETLAND
 - SEMI-PERMANENT (CLASS IV) WETLAND
 - WETLAND (CLASS III+) SETBACK (100 m)
 - WETLAND SETBACK (5 m)



REFERENCE(S)
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2. 2018 ORTHOPHOTO OBTAINED FROM TARIN RESOURCE SERVICES LTD.

PROJECTION: UTM ZONE 12 DATUM: NAD 83

CLIENT **Capital Power**

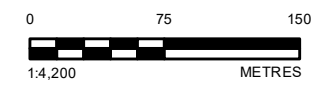
PROJECT **HALKIRK 2 WIND POWER PROJECT**

TITLE **QUARTER SECTION: NE 34-39-14 W4M**

CONSULTANT

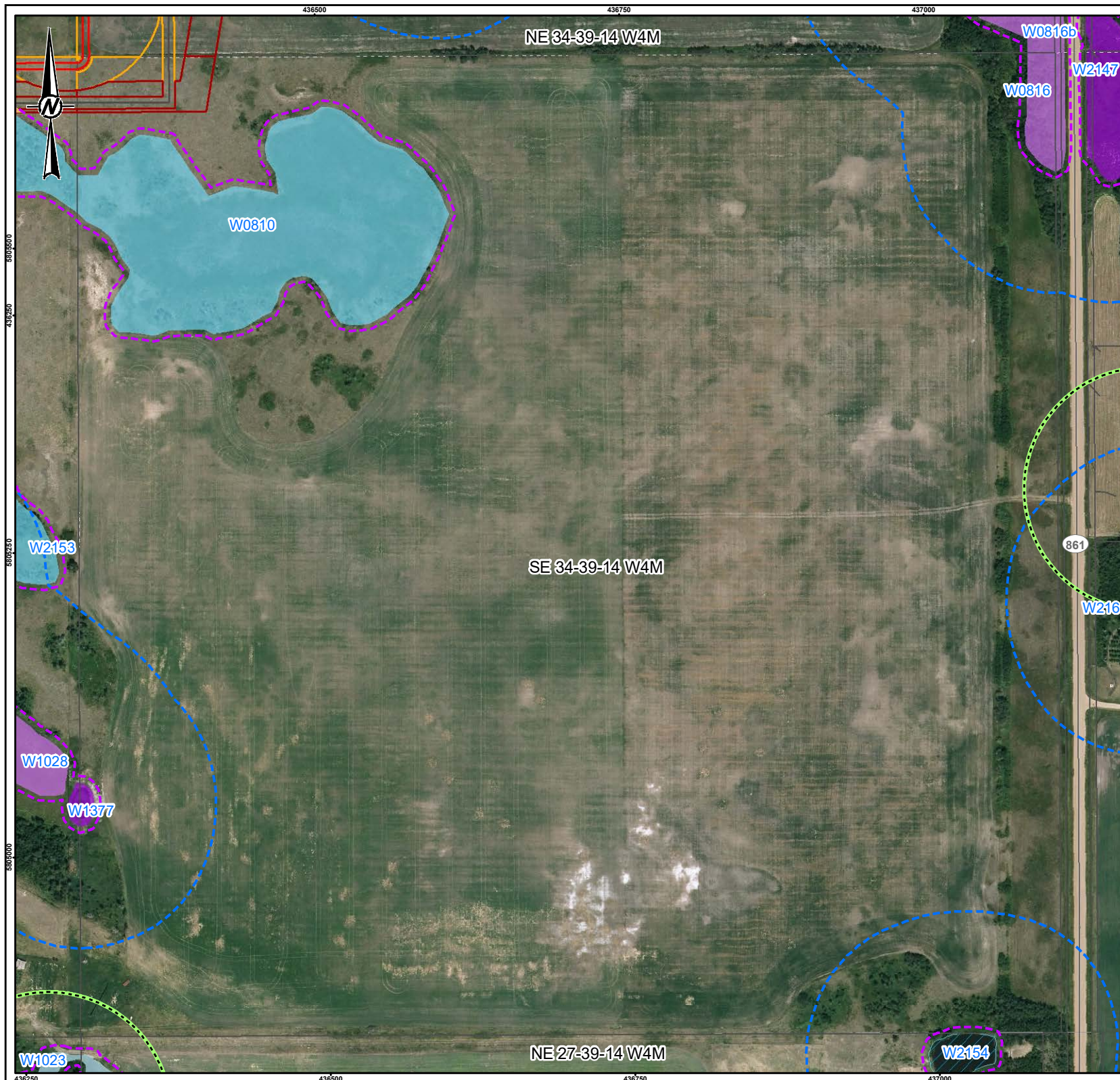
YYYY-MM-DD	2023-09-15
DESIGNED	SC
PREPARED	LB
REVIEWED	SC
APPROVED	SC

PROJECT NO. 21452763 PHASE REV. 0 FIGURE 45

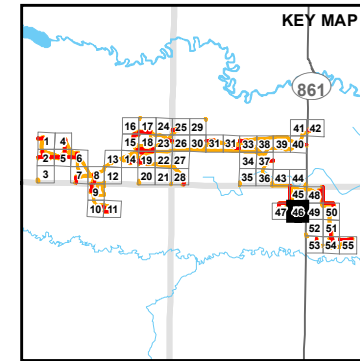


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IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B



LEGEND		ENVIRONMENTAL CONSTRAINTS		WETLAND AND WATER BODY PERMANENCE	
—	CADASTRAL		AREA OF FOOTPRINT INTERACTION/MITIGATION (SEE NOTES)		EPHEMERAL (CLASS I) WATER BODY
—	SECONDARY HIGHWAY		WETLAND SETBACK (5 m) INTERACTION (Silt fencing between the Project Footprint and wetland when work cannot be scheduled during dry or frozen periods.)		TEMPORARY (CLASS II) WETLAND
—	UNDERGROUND COLLECTOR SYSTEM		WILDLIFE HABITAT FEATURES		SEASONAL (CLASS III) WETLAND
—	CRANE PATH		NEST SETBACK		SEMI-PERMANENT (CLASS IV) WETLAND
—	OPERATION FOOTPRINT				ANTHROPOGENIC WATER BODY/MODIFIED NATURAL WETLAND
—	CONSTRUCTION FOOTPRINT				WETLAND (CLASS III+) SETBACK (100 m)
					WETLAND SETBACK (5 m)



NOTE 1 - Raptor Nest Interactions:
NA

NOTE 2 - Direct Wetland or Ephemeral Waterbody Interactions (Class I, II, III, IV and V):
NA

NOTE 3 - Wetlands within 5 m of the Footprint (Ephemeral waterbodies, drainages, Class II and higher):
NA

NOTE 4 - Within 100 m of a Class III, IV, or V (Amphibians and Waterbirds):
NA

NOTE 5 - Direct Wetland Interactions - Class IV Collector Line Crossings:
NA

GENERAL NOTE - All non cultivated areas within 100 m of construction activities:
Schedule construction outside of recommended restricted activity periods (April 1 to August 28) within all non-cultivated habitats. If construction activities occur between April 1 and August 28, non-intrusive, pre-construction nest surveys will be performed an experienced wildlife biologist within 100 m of construction activity prior to construction. If breeding activity is identified, a minimum setback buffer of 100 m will be applied to the suspected nest location until young fledge to minimize the risk of disturbing birds, nests, or eggs. When there is potential for construction activities to pose an elevated risk to wildlife, an experienced wildlife biologist will be on site to monitor wildlife behaviour and to propose on site mitigation actions that should be implemented to reduce risk to wildlife.

GENERAL NOTE - Vegetation Clearing:
Vegetation clearing will be limited to the Project Footprint and the smallest area practicable. Where possible, short shrub species will be "walked down" or simply driven over to preserve the growth crown and root network, thereby enhancing regeneration after construction is complete. Plan vegetation clearing in all non-cultivated habitats outside of the restricted activity period (April 1 – August 28) to the extent possible (refer to General Note – all non-cultivated areas within 100 m of construction activities).

GENERAL NOTE - Clubroot and Weeds:
All vehicles and construction equipment will be clean (i.e., free of soils and vegetative debris) and disinfected (and documented) prior to arrival at the Project area and cleaned prior to leaving the Project area. All vehicles and equipment will be physically cleaned to remove soil and crop debris before traversing between fields as identified by the land agent or Environmental Monitor. Choose low traffic grassy areas near the field exit to complete cleaning when possible. Remove soil and crop debris by knocking or scraping off soil lumps and sweeping loose soil and vegetation from all equipment, vehicles, or tools used during project activities. Compressed air can be used to blow off any residue left on the machinery after scraping. A pressure washer should be used to remove soil and vegetation if the equipment was operated during wet conditions. Salvaged soil materials will not be moved between different sites. Areas that exhibit extensive weed infestations prior to disturbance will have soils salvaged and stockpiled separately to prevent the contamination of larger reclamation soil volumes.

GENERAL NOTE - Turbine Foundation:
Mortality due to foundation construction activities, while not expected, may occur if wildlife falls into or becomes trapped within foundation excavations. To prevent wildlife from inadvertently falling in, open excavations or auger holes will be temporarily fenced off. Open excavations or auger holes left unsupervised will be checked daily to ensure no wildlife is trapped.

Category	Applicability	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
Raptor Nest Breeding Period	Raptor Nests and Setbacks			Wildlife Monitor Required when working in Setback									
				15-Mar				15-Jul					
Grassland Breeding Bird Nesting Period (April 1- July 15) and Migratory Bird Nesting Period, Nesting Zone B4 (April 14 - August 28)	All non cultivated areas within 100 m of construction activity.			Nest Sweep Required									
					1-Apr				28-Aug				
Amphibian Active Period (April 15 - September 15)	Direct impacts to Class III, IV and V wetlands, or work within 100 m setbacks of Class III, IV and V wetlands				Pre-Construction Amphibian Survey, Silt Fencing and Amphibian Monitoring Required as per Referral Report*		Pre-Construction Amphibian Survey, Silt Fencing and Amphibian Monitoring Recommended*						
					15-Apr		14-Jun			15-Sep			

*It is recommended that best practices for amphibian mitigation are applied during the frost-free season from about April to September 15.

REFERENCE(S)
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2. 2018 ORTHOPHOTO OBTAINED FROM TARIN RESOURCE SERVICES LTD.

PROJECTION: UTM ZONE 12 DATUM: NAD 83



CLIENT **Capital Power**

PROJECT **HALKIRK 2 WIND POWER PROJECT**

TITLE **QUARTER SECTION: SE 34-39-14 W4M**

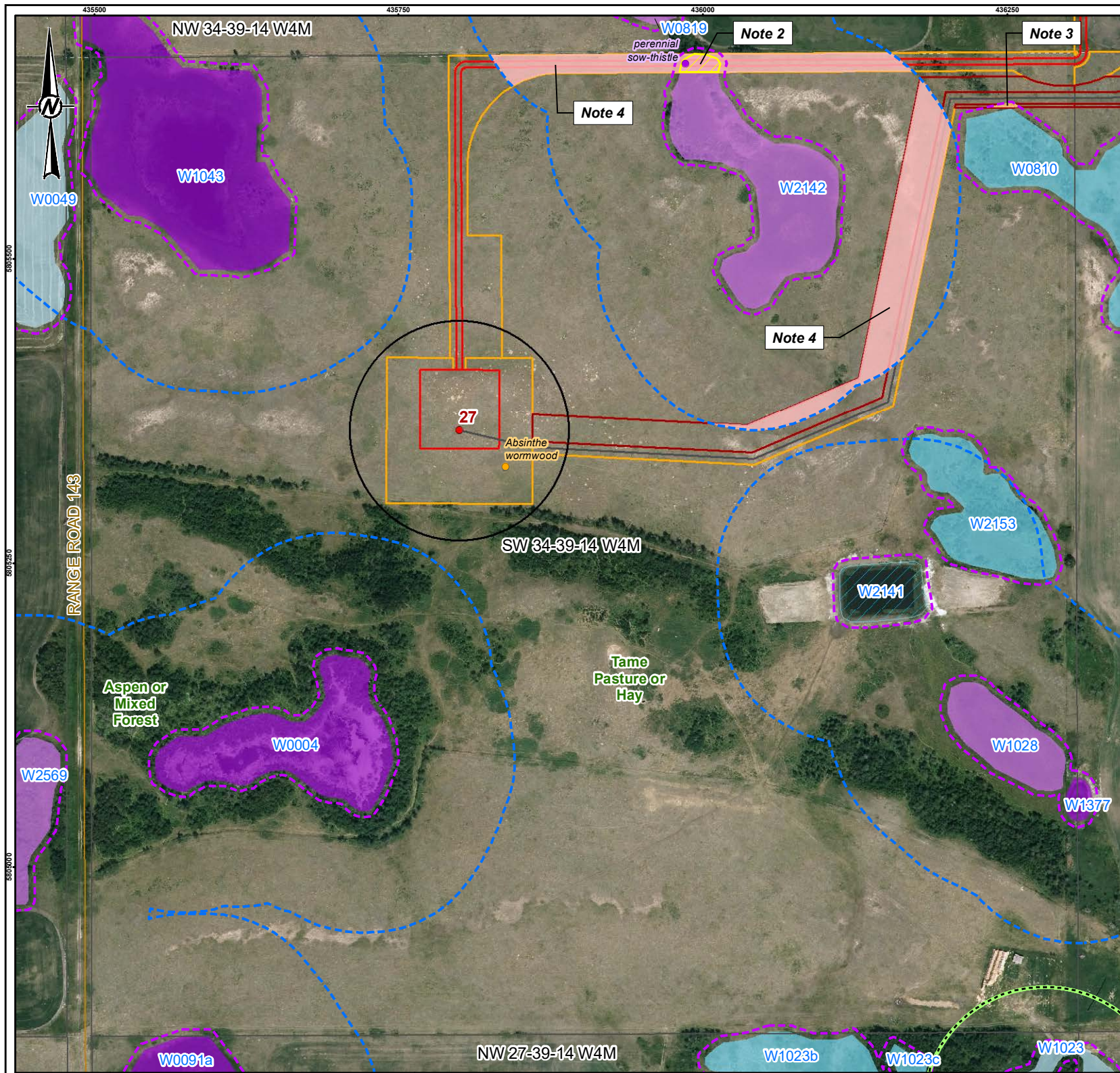
CONSULTANT

YYYY-MM-DD	2023-09-15
DESIGNED	SC
PREPARED	LB
REVIEWED	SC
APPROVED	SC

PROJECT NO. **21452763** PHASE _____ REV. **0** FIGURE **46**

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IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B



NOTE 1 - Raptor Nest Interactions:

NA

NOTE 2 - Direct Wetland or Ephemeral Waterbody Interactions (Class I, II, III, IV and V):

Direct impacts to wetlands can not extend beyond the Project Footprint and as outlined in this plan. Wetland boundaries between the Project footprint and wetland will be marked before construction start, and silt fencing will be installed to prevent vehicle traffic from entering wetlands that extend outside of the footprint when work cannot be scheduled under dry or frozen conditions. Plan construction during dry ground conditions to the extent possible, and use rig matting, geotextiles, vegetated buffer zones, earthen berms as appropriate. Wetlands temporarily disturbed will naturally regenerate from seeds present in the soil and from adjacent areas. Plan construction outside of the sensitive amphibian breeding period or implement mitigations for amphibians when intersecting Class III, IV or V (Refer to Note 4).

NOTE 3 - Wetlands within 5 m of the Footprint (Ephemeral waterbodies, drainages, Class II and higher):

Wetlands, ephemeral water bodies and drainages within 5 m of the Project Footprint will be marked prior to construction. Silt fencing will be installed between the wetland and the nearest edge of the Project Footprint if construction cannot be scheduled during dry or frozen conditions. The Environmental Monitor may require additional silt fencing as required based on site conditions. Alternatively, the Environmental Monitor may determine silt fencing is not needed based on the distance of the wettest edge to the Project Footprint.

NOTE 4 - Within 100 m of a Class III, IV, or V (Amphibians and Waterbirds):

Schedule construction outside of the amphibian active period (i.e., breeding period and post-breeding period to first frost, approximately April 15 to September 15). When construction within 100 m wetlands setbacks with the potential to support amphibian populations cannot be scheduled outside the amphibian active period (April 15 to September 15), a pre-construction amphibian survey will be conducted. If the pre-construction amphibian survey confirms the presence of amphibians, exclusion fencing will be installed and maintained along the nearest edge of the Project Footprint. An experienced wildlife biologist or qualified environmental monitor will conduct an amphibian salvage program, if required. Nest searches will be performed within the 100 m setback by an experienced wildlife biologist, to identify breeding birds or their nests if construction is scheduled between April 1 and August 28. If breeding activity is identified, an appropriate setback buffer will be applied.

NOTE 5 - Direct Wetland Interactions - Class IV Collector Line Crossings:

NA

GENERAL NOTE - All non cultivated areas within 100 m of construction activities:

Schedule construction outside of recommended restricted activity periods (April 1 to August 28) within all non-cultivated habitats. If construction activities occur between April 1 and August 28, non-intrusive, pre-construction nest surveys will be performed an experienced wildlife biologist within 100 m of construction activity prior to construction. If breeding activity is identified, a minimum setback buffer of 100 m will be applied to the suspected nest location until young fledge to minimize the risk of disturbing birds, nests, or eggs. When there is potential for construction activities to pose an elevated risk to wildlife, an experienced wildlife biologist will be on site to monitor wildlife behaviour and to propose on site mitigation actions that should be implemented to reduce risk to wildlife.

GENERAL NOTE - Vegetation Clearing:

Vegetation clearing will be limited to the Project Footprint and the smallest area practicable. Where possible, short shrub species will be "walked down" or simply driven over to preserve the growth crown and root network, thereby enhancing regeneration after construction is complete. Plan vegetation clearing in all non-cultivated habitats outside of the restricted activity period (April 1 - August 28) to the extent possible (refer to General Note - all non-cultivated areas within 100 m of construction activities).

GENERAL NOTE - Clubroot and Weeds:

All vehicles and construction equipment will be clean (i.e., free of soils and vegetative debris) and disinfected (and documented) prior to arrival at the Project area and cleaned prior to leaving the Project area. All vehicles and equipment will be physically cleaned to remove soil and crop debris before traversing between fields as identified by the land agent or Environmental Monitor. Choose low traffic grassy areas near the field exit to complete cleaning when possible. Remove soil and crop debris by knocking or scraping off soil lumps and sweeping loose soil and vegetation from all equipment, vehicles, or tools used during project activities. Compressed air can be used to blow off any residue left on the machinery after scraping. A pressure washer should be used to remove soil and vegetation if the equipment was operated during wet conditions. Salvaged soil materials will not be moved between different sites. Areas that exhibit extensive weed infestations prior to disturbance will have soils salvaged and stockpiled separately to prevent the contamination of larger reclamation soil volumes.

GENERAL NOTE - Turbine Foundation:

Mortality due to foundation construction activities, while not expected, may occur if wildlife falls into or becomes trapped within foundation excavations. To prevent wildlife from inadvertently falling in, open excavations or auger holes will be temporarily fenced off. Open excavations or auger holes left unsupervised will be checked daily to ensure no wildlife is trapped.

Category	Applicability	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
Raptor Nest Breeding Period	Raptor Nests and Setbacks			Wildlife Monitor Required when working in Setback									
				15-Mar				15-Jul					
Grassland Breeding Bird Nesting Period (April 1- July 15) and Migratory Bird Nesting Period, Nesting Zone B4 (April 14 - August 28)	All non cultivated areas within 100 m of construction activity.			Nest Sweep Required									
					1-Apr				28-Aug				
Amphibian Active Period (April 15 - September 15)	Direct impacts to Class III, IV and V wetlands, or work within 100 m setbacks of Class III, IV and V wetlands				Pre-Construction Amphibian Survey, Silt Fencing and Amphibian Monitoring Required as per Referral Report*		Pre-Construction Amphibian Survey, Silt Fencing and Amphibian Monitoring Recommended*						
					15-Apr		14-Jun			15-Sep			

*It is recommended that best practices for amphibian mitigation are applied during the frost-free season from about April to September 15.

LEGEND

— CADASTRAL

— LOCAL ROAD

PROJECT LAYOUT

● TURBINE

— ROTOR-SWEPT AREA

— UNDERGROUND COLLECTOR SYSTEM

— CRANE PATH

— OPERATION FOOTPRINT

— CONSTRUCTION FOOTPRINT

ENVIRONMENTAL CONSTRAINTS

— AREA OF FOOTPRINT INTERACTION/MITIGATION (SEE NOTES)

— WETLAND SETBACK (5 m) INTERACTION (Silt fencing between the Project Footprint and wetland when work cannot be scheduled during dry or frozen periods.)

— WETLAND (CLASS III+) SETBACK (100 m) INTERACTION

WILDLIFE HABITAT FEATURES

— NEST SETBACK

WETLAND AND WATER BODY PERMANENCE

— EPHEMERAL (CLASS I) WATER BODY

— TEMPORARY (CLASS II) WETLAND

— SEASONAL (CLASS III) WETLAND

— SEMI-PERMANENT (CLASS IV) WETLAND

— ANTHROPOGENIC WATER BODY/MODIFIED NATURAL WETLAND

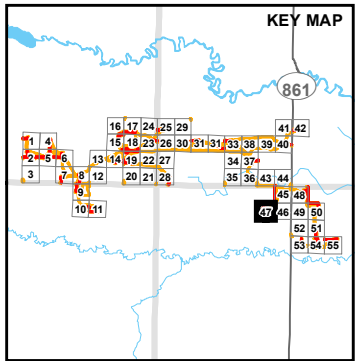
— WETLAND (CLASS III+) SETBACK (100 m)

— WETLAND SETBACK (5 m)

WEED OBSERVATION

● NOXIOUS WEED SPECIES OBSERVATION

● WEED OF CONCERN BY THE COUNTY OF PAINTEARTH

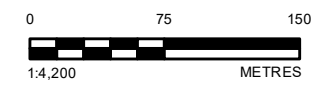


REFERENCE(S)

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2. 2018 ORTHOPHOTO OBTAINED FROM TARIN RESOURCE SERVICES LTD.

PROJECTION: UTM ZONE 12 DATUM: NAD 83



CLIENT **Capital Power**

PROJECT **HALKIRK 2 WIND POWER PROJECT**

TITLE **QUARTER SECTION: SW 34-39-14 W4M**

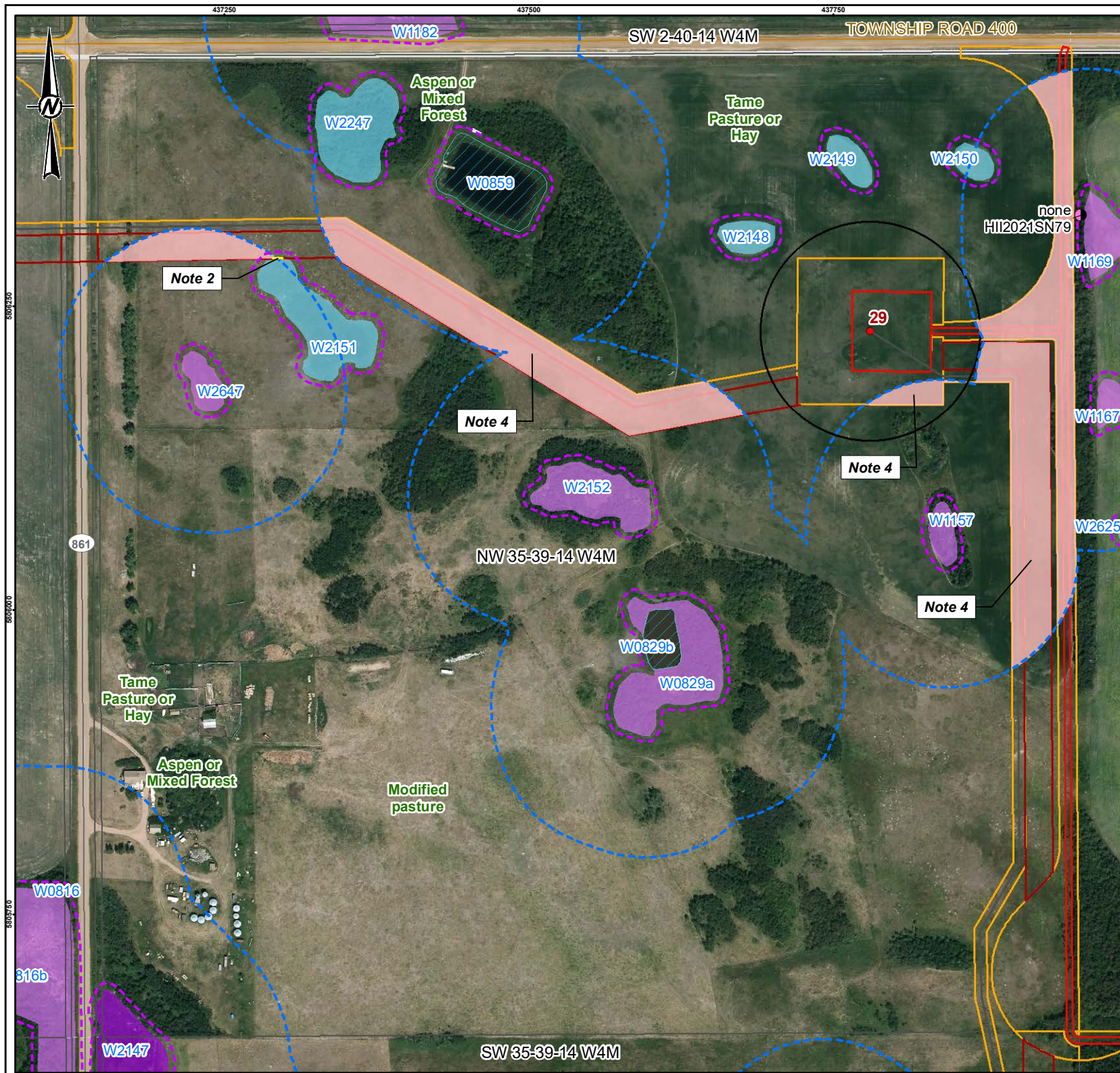
CONSULTANT **wsp**

YYYY-MM-DD	2023-09-15
DESIGNED	SC
PREPARED	LB
REVIEWED	SC
APPROVED	SC

PROJECT NO. 21452763 PHASE REV. 0 FIGURE 47

PATH: I:\CLIENT\CAPITAL_POWER\21452763\Mapping\Production\General\Environmental_Management_Plan\21452763_Fig1_Environmental_Protection_Plan_CoverSheet_Rev0.mxd PRINTED ON: 2023-09-15 AT: 3:37:06 PM

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B



NOTE 1 - Raptor Nest Interactions:
NA

NOTE 2 - Direct Wetland or Ephemeral Waterbody Interactions (Class I, II, III, IV and V):
Direct impacts to wetlands can not extend beyond the Project Footprint and as outlined in this plan. Wetland boundaries between the Project footprint and wetland will be marked before construction start, and silt fencing will be installed to prevent vehicle traffic from entering wetlands that extend outside of the footprint when work cannot be scheduled under dry or frozen conditions. Plan construction during dry ground conditions to the extent possible, and use rig matting, geotextiles, vegetated buffer zones, earthen berms as appropriate. Wetlands temporarily disturbed will naturally regenerate from seeds present in the soil and from adjacent areas. Buffer construction outside of the sensitive amphibian breeding period or implement mitigations for amphibians when intersecting Class III, IV or V (Refer to Note 4).

NOTE 3 - Wetlands within 5 m of the Footprint (Ephemeral waterbodies, drainages, Class II and higher):
NA

NOTE 4 - Within 100 m of a Class III, IV, or V (Amphibians and Waterbirds):
Schedule construction outside of the amphibian active period (i.e., breeding period and post-breeding period to first frost, approximately April 15 to September 15). When construction within 100 m wetlands setbacks with the potential to support amphibian populations cannot be scheduled outside the amphibian active period (April 15 to September 15), a pre-construction amphibian survey will be conducted. If the pre-construction amphibian survey confirms the presence of amphibians, exclusion fencing will be installed and maintained along the nearest edge of the Project Footprint. An experienced wildlife biologist or qualified environmental monitor will conduct an amphibian salvage program, if required. Nest searches will be performed within the 100 m setback by an experienced wildlife biologist, to identify breeding birds or their nests if construction is scheduled between April 1 and August 28. If breeding activity is identified, an appropriate setback buffer will be applied.

NOTE 5 - Direct Wetland Interactions - Class IV Collector Line Crossings:
NA

GENERAL NOTE - All non cultivated areas within 100 m of construction activities:
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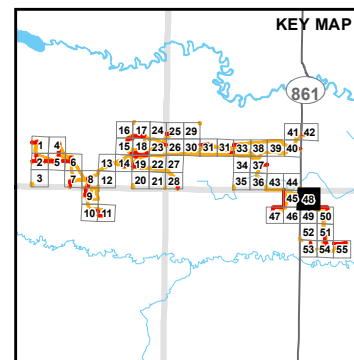
GENERAL NOTE - Clubroot and Weeds:
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GENERAL NOTE - Turbine Foundation:
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Category	Applicability	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
Raptor Nest Breeding Period	Raptor Nests and Setbacks			Wildlife Monitor Required when working in Setback									
				15-Mar				15-Jul					
Grassland Breeding Bird Nesting Period (April 1- July 15) and Migratory Bird Nesting Period, Nesting Zone B4 (April 14 - August 28)	All non cultivated areas within 100 m of construction activity.			Nest Sweep Required									
					1-Apr					28-Aug			
Amphibian Active Period (April 15 - September 15)	Direct impacts to Class III, IV and V wetlands, or work within 100 m setbacks of Class III, IV and V wetlands				Pre-Construction Amphibian Survey, Silt Fencing and Amphibian Monitoring Required as per Referral Report*		Pre-Construction Amphibian Survey, Silt Fencing and Amphibian Monitoring Recommended*						
					15-Apr	14-Jun				15-Sep			

*It is recommended that best practices for amphibian mitigation are applied during the frost-free season from about April to September 15.

- LEGEND**
- CADASTRAL
 - SECONDARY HIGHWAY
 - LOCAL ROAD
 - PROJECT LAYOUT
 - TURBINE
 - ROTOR-SWEPT AREA
 - UNDERGROUND COLLECTOR SYSTEM
 - CRANE PATH
 - OPERATION FOOTPRINT
 - CONSTRUCTION FOOTPRINT
- ENVIRONMENTAL CONSTRAINTS**
- AREA OF FOOTPRINT INTERACTION/MITIGATION (SEE NOTES)
 - WETLAND (CLASS III+) SETBACK (100 m) INTERACTION
 - UNKNOWN
 - RAPTOR NEST
- WETLAND AND WATER BODY PERMANENCE**
- TEMPORARY (CLASS II) WETLAND
 - SEASONAL (CLASS III) WETLAND
 - SEMI-PERMANENT (CLASS IV) WETLAND
 - ANTHROPOGENIC WATER BODY/MODIFIED NATURAL WETLAND
 - WETLAND (CLASS III+) SETBACK (100 m)
 - WETLAND SETBACK (5 m)



REFERENCE(S)
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2. 2018 ORTHOPHOTO OBTAINED FROM TARIN RESOURCE SERVICES LTD.

PROJECTION: UTM ZONE 12 DATUM: NAD 83



CLIENT **Capital Power**

PROJECT **HALKIRK 2 WIND POWER PROJECT**

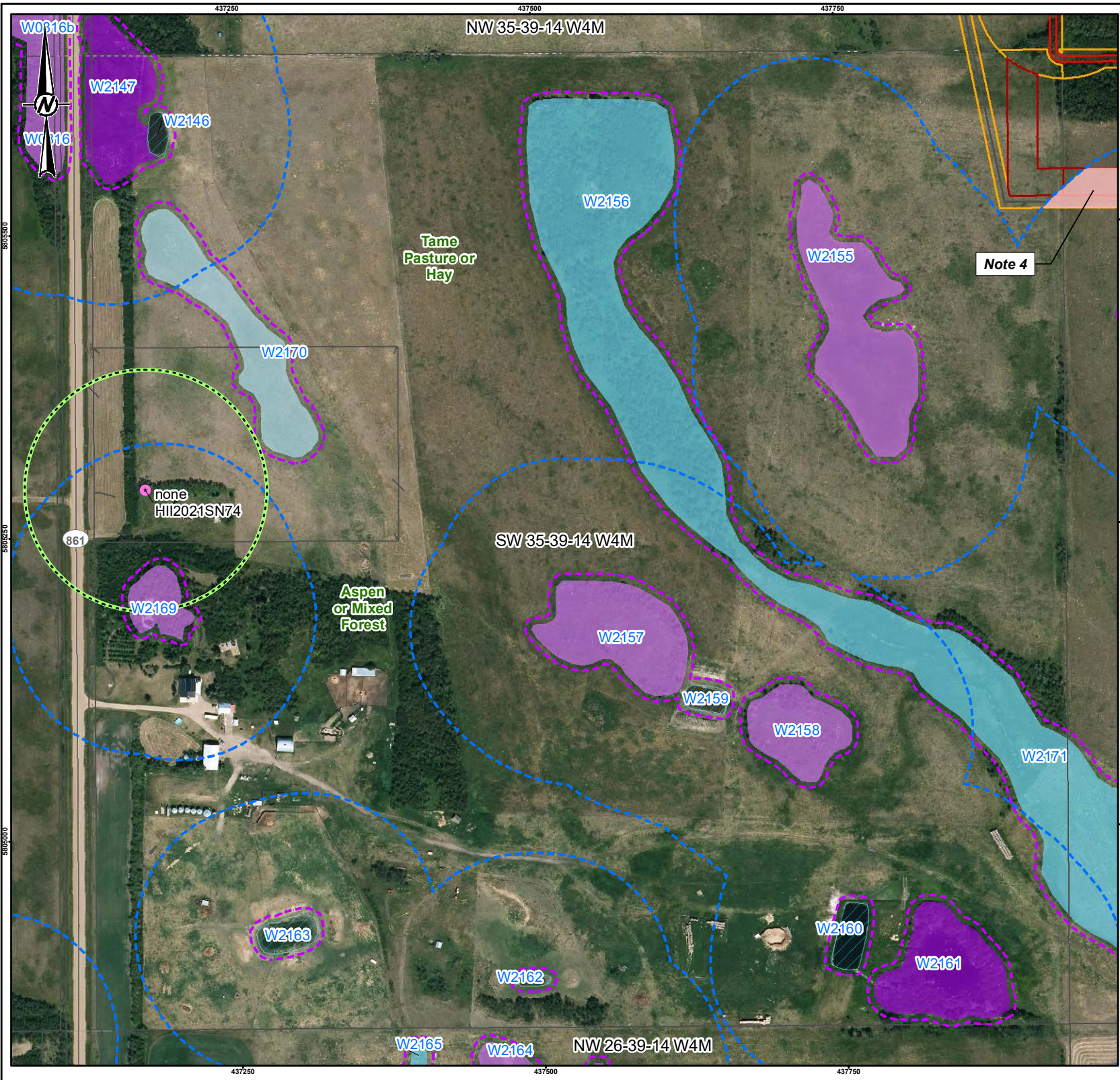
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DESIGNED	SC	
PREPARED	LB	
REVIEWED	SC	
APPROVED	SC	

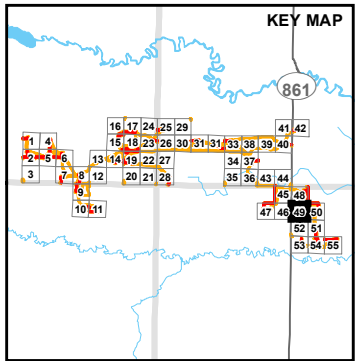
PROJECT NO. 21452763 PHASE REV. 0 FIGURE 48

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LEGEND	
	CADASTRAL
	SECONDARY HIGHWAY
	UNDERGROUND COLLECTOR SYSTEM
	CRANE PATH
	OPERATION FOOTPRINT
	CONSTRUCTION FOOTPRINT
	AREA OF FOOTPRINT INTERACTION/MITIGATION (SEE NOTES)
	WETLAND (CLASS III+) SETBACK (100 m) INTERACTION
	WILDLIFE HABITAT FEATURES
	NEST SETBACK
	ACTIVE
	RAPTOR NEST
	EPHEMERAL (CLASS I) WATER BODY
	TEMPORARY (CLASS II) WETLAND
	SEASONAL (CLASS III) WETLAND
	SEMI-PERMANENT (CLASS IV) WETLAND
	ANTHROPOGENIC WATER BODY/MODIFIED NATURAL WETLAND
	WETLAND (CLASS III+) SETBACK (100 m)
	WETLAND SETBACK (5 m)



NOTE 1 - Raptor Nest Interactions:
NA

NOTE 2 - Direct Wetland or Ephemeral Waterbody Interactions (Class I, II, III, IV and V):
NA

NOTE 3 - Wetlands within 5 m of the Footprint (Ephemeral waterbodies, drainages, Class II and higher):
NA

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NOTE 5 - Direct Wetland Interactions - Class IV Collector Line Crossings:
NA

GENERAL NOTE - All non cultivated areas within 100 m of construction activities:
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GENERAL NOTE - Turbine Foundation:
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Category	Applicability	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
Raptor Nest Breeding Period	Raptor Nests and Setbacks			Wildlife Monitor Required when working in Setback									
				15-Mar				15-Jul					
Grassland Breeding Bird Nesting Period (April 1- July 15) and Migratory Bird Nesting Period, Nesting Zone B4 (April 14 - August 28)	All non cultivated areas within 100 m of construction activity.			Nest Sweep Required									
					1-Apr				28-Aug				
Amphibian Active Period (April 15 - September 15)	Direct impacts to Class III, IV and V wetlands, or work within 100 m setbacks of Class III, IV and V wetlands				Pre-Construction Amphibian Survey, Silt Fencing and Amphibian Monitoring Required as per Referral Report*		Pre-Construction Amphibian Survey, Silt Fencing and Amphibian Monitoring Recommended*						
					15-Apr	14-Jun				15-Sep			

*It is recommended that best practices for amphibian mitigation are applied during the frost-free season from about April to September 15.

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PROJECTION: UTM ZONE 12 DATUM: NAD 83

CLIENT **Capital Power**

PROJECT **HALKIRK 2 WIND POWER PROJECT**

TITLE **QUARTER SECTION: SW 35-39-14 W4M**

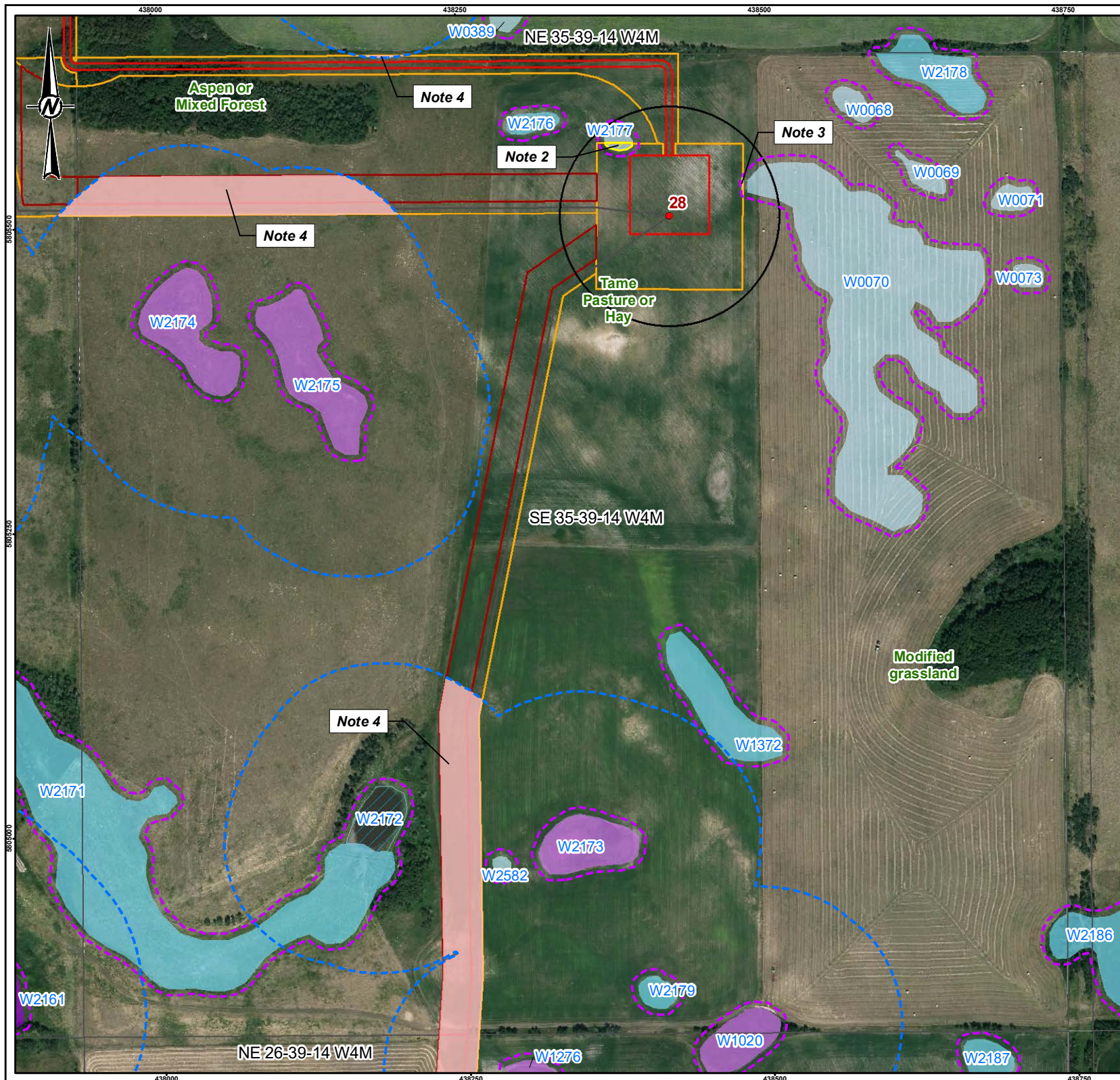
CONSULTANT **wsp**

YYYY-MM-DD	2023-09-15
DESIGNED	SC
PREPARED	LB
REVIEWED	SC
APPROVED	SC

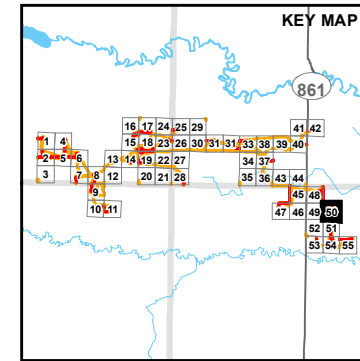
PROJECT NO. 21452763 PHASE REV. 0 FIGURE 49

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IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B



LEGEND		ENVIRONMENTAL CONSTRAINTS		WETLAND AND WATER BODY PERMANENCE	
	CADASTRAL		AREA OF FOOTPRINT INTERACTION/MITIGATION (SEE NOTES)		EPHEMERAL (CLASS I) WATER BODY
	TURBINE		WETLAND SETBACK (5 m) INTERACTION (Silt fencing between the Project Footprint and wetland when work cannot be scheduled during dry or frozen periods.)		TEMPORARY (CLASS II) WETLAND
	ROTOR-SWEPT AREA		WETLAND (CLASS III+) SETBACK (100 m) INTERACTION		SEASONAL (CLASS III) WETLAND
	UNDERGROUND COLLECTOR SYSTEM				SEMI-PERMANENT (CLASS IV) WETLAND
	CRANE PATH				ANTHROPOGENIC WATER BODY/MODIFIED NATURAL WETLAND
	OPERATION FOOTPRINT				WETLAND (CLASS III+) SETBACK (100 m)
	CONSTRUCTION FOOTPRINT				WETLAND SETBACK (5 m)



NOTE 1 - Raptor Nest Interactions:
NA

NOTE 2 - Direct Wetland or Ephemeral Waterbody Interactions (Class I, II, III, IV and V):
Direct impacts to wetlands can not extend beyond the Project Footprint and as outlined in this plan. Wetland boundaries between the Project footprint and wetland will be marked before construction start, and silt fencing will be installed to prevent vehicle traffic from entering wetlands that extend outside of the footprint when work cannot be scheduled under dry or frozen conditions. Plan construction during dry ground conditions to the extent possible, and use rig matting, geotextiles, vegetated buffer zones, earthen berms as appropriate. Wetlands temporarily disturbed will naturally regenerate from seeds present in the soil and from adjacent areas. Plan construction outside of the sensitive amphibian breeding period or implement mitigations for amphibians when intersecting Class III, IV or V (Refer to Note 4).

NOTE 3 - Wetlands within 5 m of the Footprint (Ephemeral waterbodies, drainages, Class II and higher):
Wetlands, ephemeral water bodies and drainages within 5 m of the Project Footprint will be marked prior to construction. Silt fencing will be installed between the wetland and the nearest edge of the Project Footprint if construction cannot be scheduled during dry or frozen conditions. The Environmental Monitor may require additional silt fencing as required based on site conditions. Alternatively, the Environmental Monitor may determine silt fencing is not needed based on the distance of the wettest edge to the Project Footprint.

NOTE 4 - Within 100 m of a Class III, IV, or V (Amphibians and Waterbirds):
Schedule construction outside of the amphibian active period (i.e., breeding period and post-breeding period to first frost, approximately April 15 to September 15). When construction within 100 m wetlands setbacks with the potential to support amphibian populations cannot be scheduled outside the amphibian active period (April 15 to September 15), a pre-construction amphibian survey will be conducted. If the pre-construction amphibian survey confirms the presence of amphibians, exclusion fencing will be installed and maintained along the nearest edge of the Project Footprint. An experienced wildlife biologist or qualified environmental monitor will conduct an amphibian salvage program, if required. Nest searches will be performed within the 100 m setback by an experienced wildlife biologist, to identify breeding birds or their nests if construction is scheduled between April 1 and August 28. If breeding activity is identified, an appropriate setback buffer will be applied.

NOTE 5 - Direct Wetland Interactions - Class IV Collector Line Crossings:
NA

GENERAL NOTE - All non cultivated areas within 100 m of construction activities:
Schedule construction outside of recommended restricted activity periods (April 1 to August 28) within all non-cultivated habitats. If construction activities occur between April 1 and August 28, non-intrusive, pre-construction nest surveys will be performed an experienced wildlife biologist within 100 m of construction activity prior to construction. If breeding activity is identified, a minimum setback buffer of 100 m will be applied to the suspected nest location until young fledge to minimize the risk of disturbing birds, nests, or eggs. When there is potential for construction activities to pose an elevated risk to wildlife, an experienced wildlife biologist will be on site to monitor wildlife behaviour and to propose on site mitigation actions that should be implemented to reduce risk to wildlife.

GENERAL NOTE - Vegetation Clearing:
Vegetation clearing will be limited to the Project Footprint and the smallest area practicable. Where possible, short shrub species will be "walked down" or simply driven over to preserve the growth crown and root network, thereby enhancing regeneration after construction is complete. Plan vegetation clearing in all non-cultivated habitats outside of the restricted activity period (April 1 – August 28) to the extent possible (refer to General Note – all non-cultivated areas within 100 m of construction activities).

GENERAL NOTE - Clubroot and Weeds:
All vehicles and construction equipment will be clean (i.e., free of soils and vegetative debris) and disinfected (and documented) prior to arrival at the Project area and cleaned prior to leaving the Project area. All vehicles and equipment will be physically cleaned to remove soil and crop debris before traversing between fields as identified by the land agent or Environmental Monitor. Choose low traffic grassy areas near the field exit to complete cleaning when possible. Remove soil and crop debris by knocking or scraping off soil lumps and sweeping loose soil and vegetation from all equipment, vehicles, or tools used during project activities. Compressed air can be used to blow off any residue left on the machinery after scraping. A pressure washer should be used to remove soil and vegetation if the equipment was operated during wet conditions. Salvaged soil materials will not be moved between different sites. Areas that exhibit extensive weed infestations prior to disturbance will have soils salvaged and stockpiled separately to prevent the contamination of larger reclamation soil volumes.

GENERAL NOTE - Turbine Foundation:
Mortality due to foundation construction activities, while not expected, may occur if wildlife falls into or becomes trapped within foundation excavations. To prevent wildlife from inadvertently falling in, open excavations or auger holes will be temporarily fenced off. Open excavations or auger holes left unsupervised will be checked daily to ensure no wildlife is trapped.

Category	Applicability	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
Raptor Nest Breeding Period	Raptor Nests and Setbacks			Wildlife Monitor Required when working in Setback									
				15-Mar				15-Jul					
Grassland Breeding Bird Nesting Period (April 1- July 15) and Migratory Bird Nesting Period, Nesting Zone B4 (April 14 - August 28)	All non cultivated areas within 100 m of construction activity.			Nest Sweep Required									
					1-Apr				28-Aug				
Amphibian Active Period (April 15 - September 15)	Direct impacts to Class III, IV and V wetlands, or work within 100 m setbacks of Class III, IV and V wetlands				Pre-Construction Amphibian Survey, Silt Fencing and Amphibian Monitoring Required as per Referral Report*		Pre-Construction Amphibian Survey, Silt Fencing and Amphibian Monitoring Recommended*						
					15-Apr		14-Jun			15-Sep			

*It is recommended that best practices for amphibian mitigation are applied during the frost-free season from about April to September 15.

REFERENCE(S)
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2. 2018 ORTHOPHOTO OBTAINED FROM TARIN RESOURCE SERVICES LTD.

PROJECTION: UTM ZONE 12 DATUM: NAD 83

CLIENT **Capital Power**

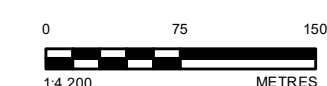
PROJECT **HALKIRK 2 WIND POWER PROJECT**

TITLE **QUARTER SECTION: SE 35-39-14 W4M**

CONSULTANT **wsp**

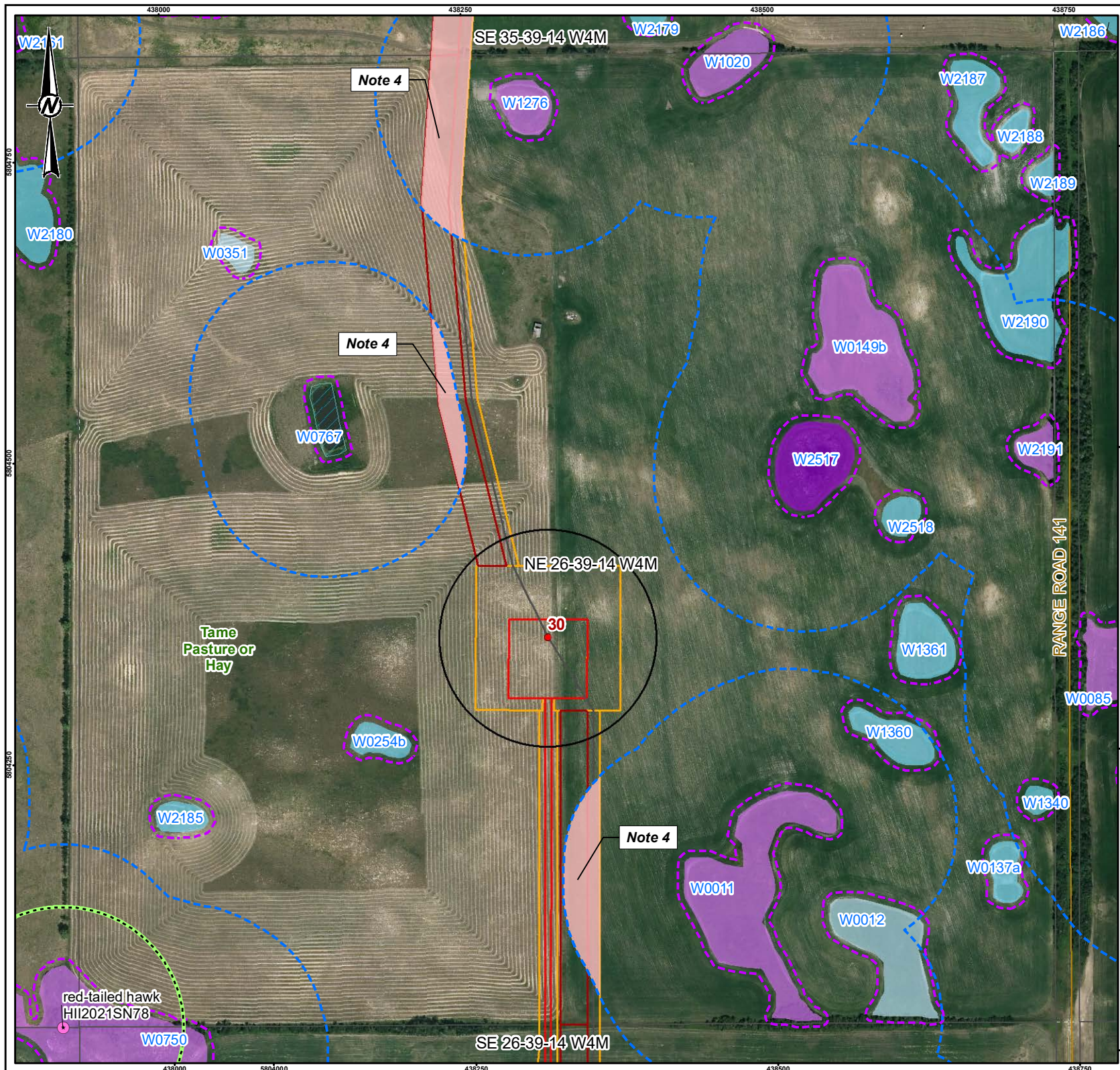
DESIGNED	SC
PREPARED	LB
REVIEWED	SC
APPROVED	SC

PROJECT NO. 21452763 PHASE REV. 0 FIGURE 50



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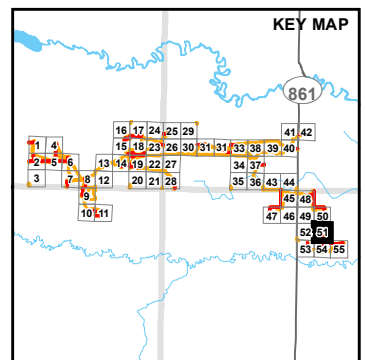
IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B



- LEGEND**
- CADASTRAL
 - LOCAL ROAD
 - PROJECT LAYOUT**
 - TURBINE
 - ROTOR-SWEPT AREA
 - UNDERGROUND COLLECTOR SYSTEM
 - CRANE PATH
 - OPERATION FOOTPRINT
 - CONSTRUCTION FOOTPRINT

- ENVIRONMENTAL CONSTRAINTS**
- AREA OF FOOTPRINT INTERACTION/MITIGATION (SEE NOTES)
 - WETLAND (CLASS III+) SETBACK (100 m) INTERACTION
 - WILDLIFE HABITAT FEATURES**
 - NEST SETBACK
 - ACTIVE
 - RAPTOR NEST

- WETLAND AND WATER BODY PERMANENCE**
- EPHEMERAL (CLASS I) WATER BODY
 - TEMPORARY (CLASS II) WETLAND
 - SEASONAL (CLASS III) WETLAND
 - SEMI-PERMANENT (CLASS IV) WETLAND
 - ANTHROPOGENIC WATER BODY/MODIFIED NATURAL WETLAND
 - WETLAND (CLASS III+) SETBACK (100 m)
 - WETLAND SETBACK (5 m)



NOTE 1 - Raptor Nest Interactions:
NA

NOTE 2 - Direct Wetland or Ephemeral Waterbody Interactions (Class I, II, III, IV and V):
NA

NOTE 3 - Wetlands within 5 m of the Footprint (Ephemeral waterbodies, drainages, Class II and higher):
NA

NOTE 4 - Within 100 m of a Class III, IV, or V (Amphibians and Waterbirds):
Schedule construction outside of the amphibian active period (i.e., breeding period and post-breeding period to first frost, approximately April 15 to September 15). When construction within 100 m wetlands setbacks with the potential to support amphibian populations cannot be scheduled outside the amphibian active period (April 15 to September 15), a pre-construction amphibian survey will be conducted. If the pre-construction amphibian survey confirms the presence of amphibians, exclusion fencing will be installed and maintained along the nearest edge of the Project Footprint. An experienced wildlife biologist or qualified environmental monitor will conduct an amphibian salvage program, if required. Nest searches will be performed within the 100 m setback by an experienced wildlife biologist, to identify breeding birds or their nests if construction is scheduled between April 1 and August 28. If breeding activity is identified, an appropriate setback buffer will be applied.

NOTE 5 - Direct Wetland Interactions - Class IV Collector Line Crossings:
NA

GENERAL NOTE - All non cultivated areas within 100 m of construction activities:
Schedule construction outside of recommended restricted activity periods (April 1 to August 28) within all non-cultivated habitats. If construction activities occur between April 1 and August 28, non-intrusive, pre-construction nest surveys will be performed by an experienced wildlife biologist within 100 m of construction activity prior to construction. If breeding activity is identified, a minimum setback buffer of 100 m will be applied to the suspected nest location until young fledge to minimize the risk of disturbing birds, nests, or eggs. When there is potential for construction activities to pose an elevated risk to wildlife, an experienced wildlife biologist will be on site to monitor wildlife behaviour and to propose on site mitigation actions that should be implemented to reduce risk to wildlife.

GENERAL NOTE - Vegetation Clearing:
Vegetation clearing will be limited to the Project Footprint and the smallest area practicable. Where possible, short shrub species will be "walked down" or simply driven over to preserve the growth crown and root network, thereby enhancing regeneration after construction is complete. Plan vegetation clearing in all non-cultivated habitats outside of the restricted activity period (April 1 - August 28) to the extent possible (refer to General Note - all non-cultivated areas within 100 m of construction activities).

GENERAL NOTE - Clubroot and Weeds:
All vehicles and construction equipment will be clean (i.e., free of soils and vegetative debris) and disinfected (and documented) prior to arrival at the Project area and cleaned prior to leaving the Project area. All vehicles and equipment will be physically cleaned to remove soil and crop debris before traversing between fields as identified by the land agent or Environmental Monitor. Choose low traffic grassy areas near the field exit to complete cleaning when possible. Remove soil and crop debris by knocking or scraping off soil lumps and sweeping loose soil and vegetation from all equipment, vehicles, or tools used during project activities. Compressed air can be used to blow off any residue left on the machinery after scraping. A pressure washer should be used to remove soil and vegetation if the equipment was operated during wet conditions. Salvaged soil materials will not be moved between different sites. Areas that exhibit extensive weed infestations prior to disturbance will have soils salvaged and stockpiled separately to prevent the contamination of larger reclamation soil volumes.

GENERAL NOTE - Turbine Foundation:
Mortality due to foundation construction activities, while not expected, may occur if wildlife falls into or becomes trapped within foundation excavations. To prevent wildlife from inadvertently falling in, open excavations or auger holes will be temporarily fenced off. Open excavations or auger holes left unsupervised will be checked daily to ensure no wildlife is trapped.

Category	Applicability	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
Raptor Nest Breeding Period	Raptor Nests and Setbacks			Wildlife Monitor Required when working in Setback 15-Mar				15-Jul					
Grassland Breeding Bird Nesting Period (April 1- July 15) and Migratory Bird Nesting Period, Nesting Zone B4 (April 14 - August 28)	All non cultivated areas within 100 m of construction activity.			Nest Sweep Required									
Amphibian Active Period (April 15 - September 15)	Direct impacts to Class III, IV and V wetlands, or work within 100 m setbacks of Class III, IV and V wetlands				1-Apr Pre-Construction Amphibian Survey, Silt Fencing and Amphibian Monitoring Required as per Referral Report*				28-Aug Pre-Construction Amphibian Survey, Silt Fencing and Amphibian Monitoring Recommended*				
					15-Apr		14-Jun			15-Sep			

*It is recommended that best practices for amphibian mitigation are applied during the frost-free season from about April to September 15.

REFERENCE(S)

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- 2018 ORTHOPHOTO OBTAINED FROM TARIN RESOURCE SERVICES LTD.

PROJECTION: UTM ZONE 12 DATUM: NAD 83

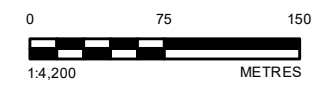
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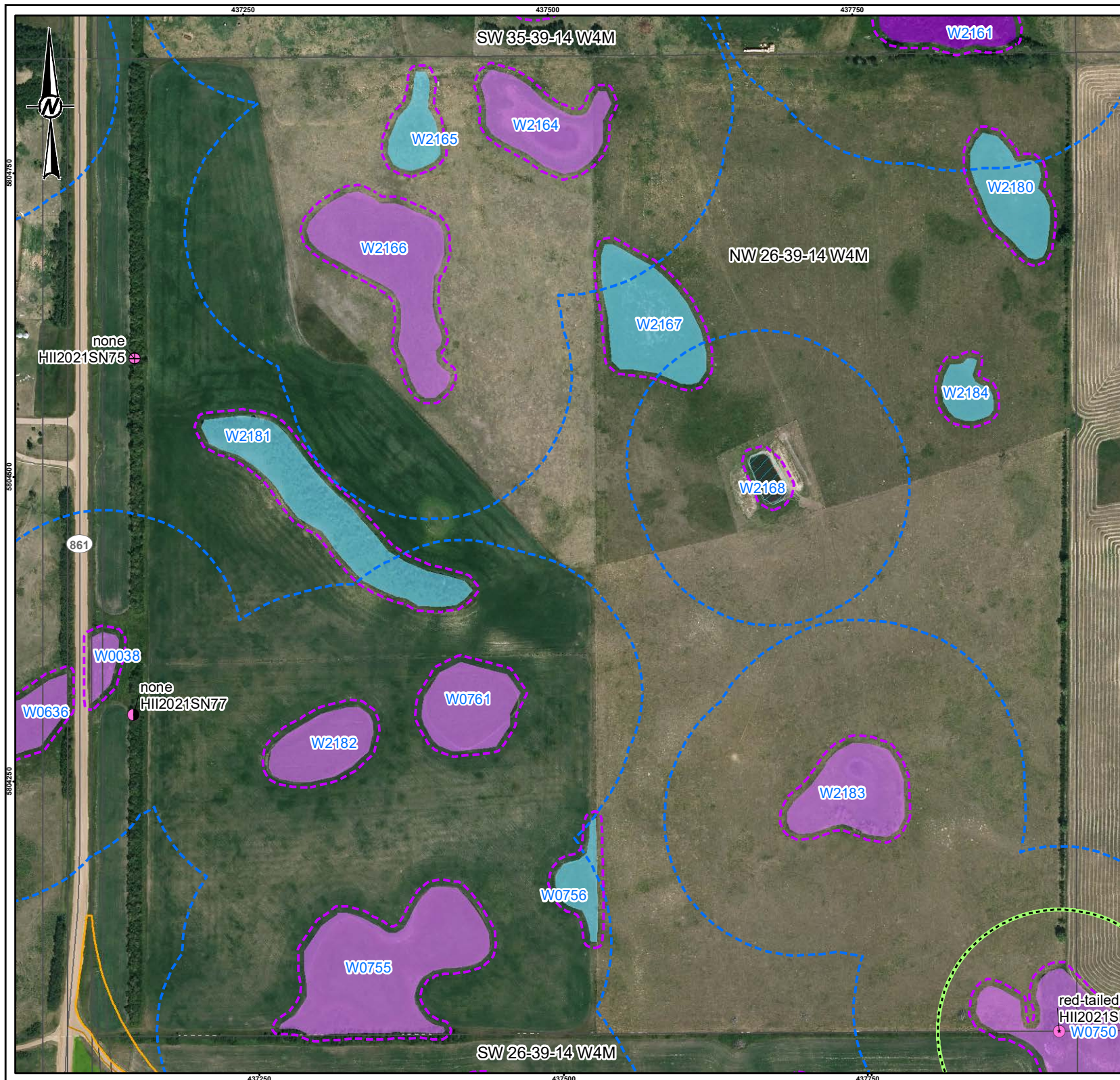
PROJECT **HALKIRK 2 WIND POWER PROJECT**

TITLE **QUARTER SECTION: NE 26-39-14 W4M**

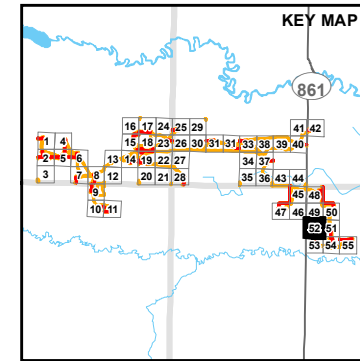
CONSULTANT

YYYY-MM-DD	2023-09-15
DESIGNED	SC
PREPARED	LB
REVIEWED	SC
APPROVED	SC





- LEGEND**
- CADASTRAL
 - SECONDARY HIGHWAY
 - LOCAL ROAD
 - NATIVE GRASSLAND
 - CONSTRUCTION FOOTPRINT
- ENVIRONMENTAL CONSTRAINTS**
- AREA OF FOOTPRINT INTERACTION/MITIGATION (SEE NOTES)
 - WILDLIFE HABITAT FEATURES
 - NEST SETBACK
 - ACTIVE
 - INACTIVE
 - UNKNOWN
 - RAPTOR NEST
- WETLAND AND WATER BODY PERMANENCE**
- TEMPORARY (CLASS II) WETLAND
 - SEASONAL (CLASS III) WETLAND
 - SEMI-PERMANENT (CLASS IV) WETLAND
 - ANTHROPOGENIC WATER BODY/MODIFIED NATURAL WETLAND
 - WETLAND (CLASS III+) SETBACK (100 m)
 - WETLAND SETBACK (5 m)



NOTE 1 - Raptor Nest Interactions:
NA

NOTE 2 - Direct Wetland or Ephemeral Waterbody Interactions (Class I, II, III, IV and V):
NA

NOTE 3 - Wetlands within 5 m of the Footprint (Ephemeral waterbodies, drainages, Class II and higher):
NA

NOTE 4 - Within 100 m of a Class III, IV, or V (Amphibians and Waterbirds):
NA

NOTE 5 - Direct Wetland Interactions - Class IV Collector Line Crossings:
NA

GENERAL NOTE - All non cultivated areas within 100 m of construction activities:
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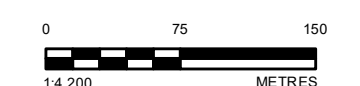
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Category	Applicability	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
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Amphibian Active Period (April 15 - September 15)	Direct impacts to Class III, IV and V wetlands, or work within 100 m setbacks of Class III, IV and V wetlands				1-Apr Pre-Construction Amphibian Survey, Silt Fencing and Amphibian Monitoring Required as per Referral Report*			28-Aug Pre-Construction Amphibian Survey, Silt Fencing and Amphibian Monitoring Recommended*					
					15-Apr		14-Jun			15-Sep			

*It is recommended that best practices for amphibian mitigation are applied during the frost-free season from about April to September 15.

REFERENCE(S)
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PROJECTION: UTM ZONE 12 DATUM: NAD 83



CLIENT **Capital Power**

PROJECT **HALKIRK 2 WIND POWER PROJECT**

TITLE **QUARTER SECTION: NW 26-39-14 W4M**

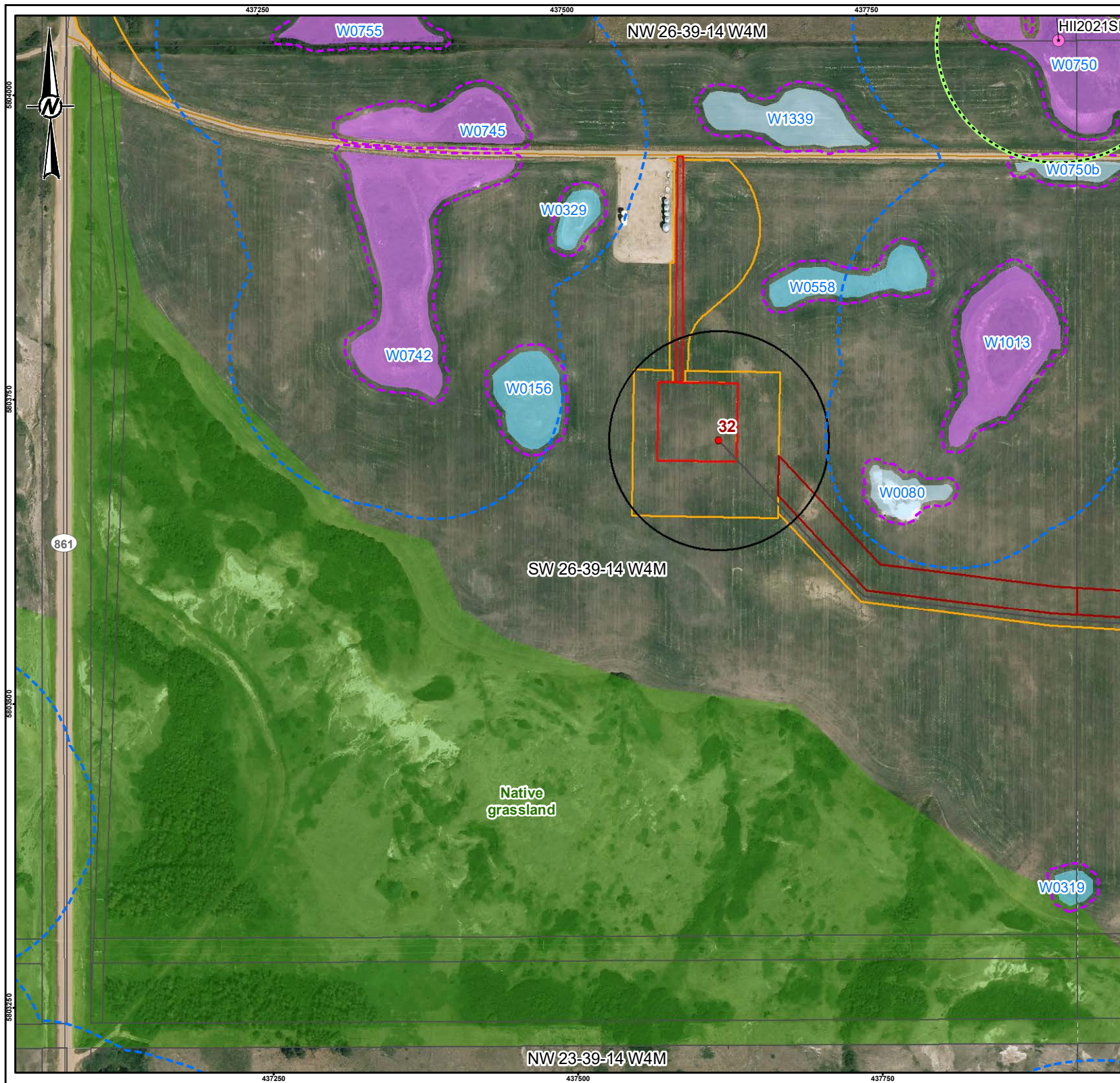
CONSULTANT **wsp**

YYYY-MM-DD	2023-09-15
DESIGNED	SC
PREPARED	LB
REVIEWED	SC
APPROVED	SC

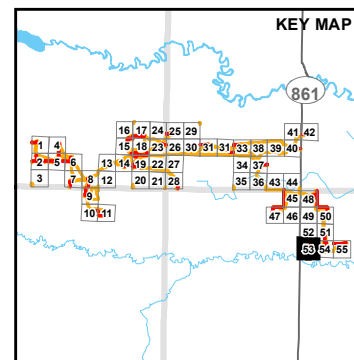
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IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B



- LEGEND**
- CADASTRAL
 - SECONDARY HIGHWAY
 - LOCAL ROAD
 - NATIVE GRASSLAND
 - PROJECT LAYOUT**
 - TURBINE
 - ROTOR-SWEPT AREA
 - UNDERGROUND COLLECTOR SYSTEM
 - CRANE PATH
 - OPERATION FOOTPRINT
 - CONSTRUCTION FOOTPRINT
- ENVIRONMENTAL CONSTRAINTS**
- AREA OF FOOTPRINT INTERACTION/MITIGATION (SEE NOTES)
 - WILDLIFE HABITAT FEATURES**
 - NEST SETBACK
 - ACTIVE
 - RAPTOR NEST
- WETLAND AND WATER BODY PERMANENCE**
- EPHEMERAL (CLASS I) WATER BODY
 - TEMPORARY (CLASS II) WETLAND
 - SEASONAL (CLASS III) WETLAND
 - WETLAND (CLASS III+) SETBACK (100 m)
 - WETLAND SETBACK (5 m)



NOTE 1 - Raptor Nest Interactions:

NA

NOTE 2 - Direct Wetland or Ephemeral Waterbody Interactions (Class I, II, III, IV and V):

NA

NOTE 3 - Wetlands within 5 m of the Footprint (Ephemeral waterbodies, drainages, Class II and higher):

NA

NOTE 4 - Within 100 m of a Class III, IV, or V (Amphibians and Waterbirds):

NA

NOTE 5 - Direct Wetland Interactions - Class IV Collector Line Crossings:

NA

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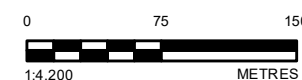
Category	Applicability	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
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					1-Apr				28-Aug				
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					15-Apr	14-Jun				15-Sep			

*It is recommended that best practices for amphibian mitigation are applied during the frost-free season from about April to September 15.

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- 2018 ORTHOPHOTO OBTAINED FROM TARIN RESOURCE SERVICES LTD.

PROJECTION: UTM ZONE 12 DATUM: NAD 83



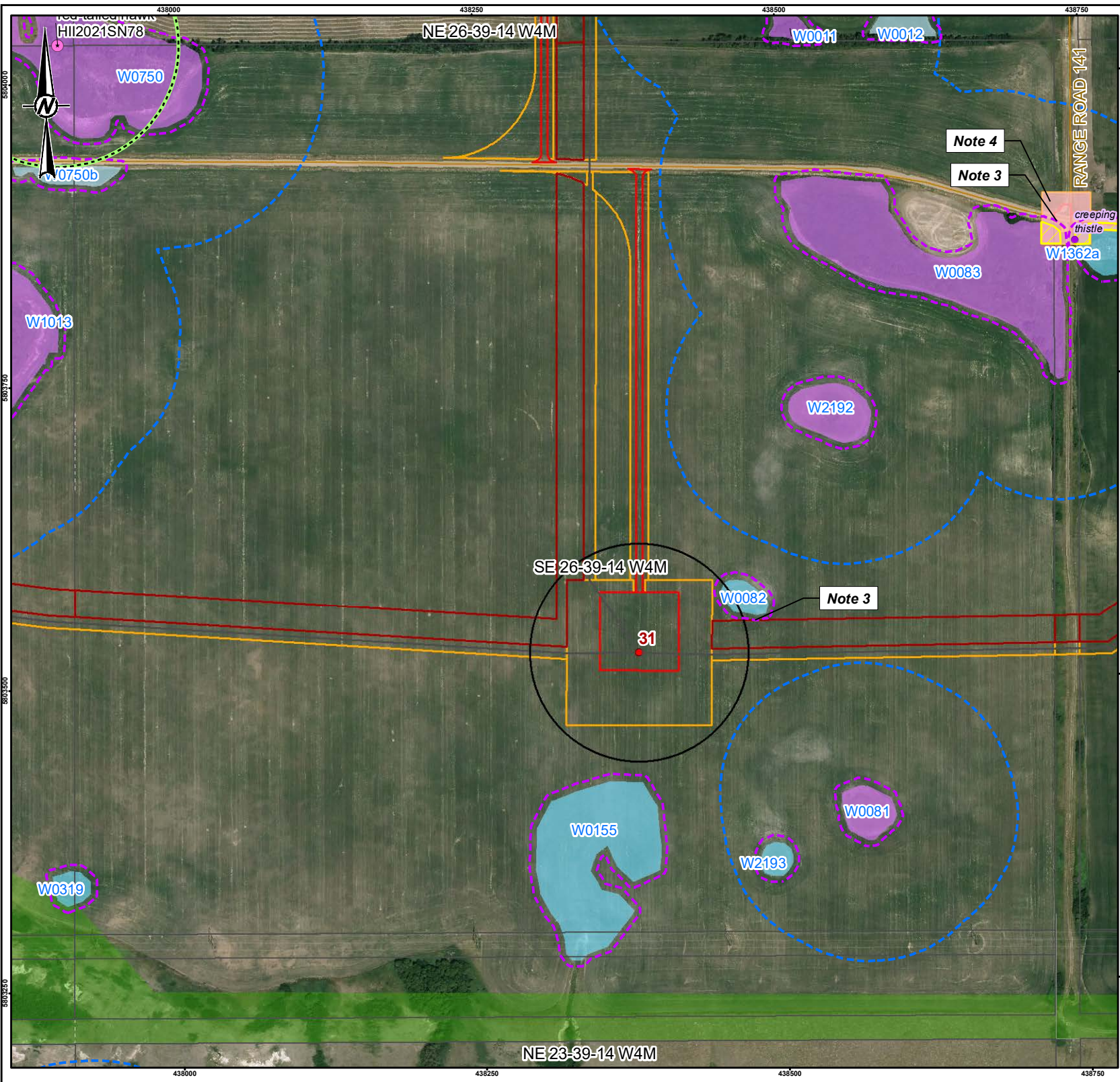
CLIENT
Capital Power

PROJECT
HALKIRK 2 WIND POWER PROJECT

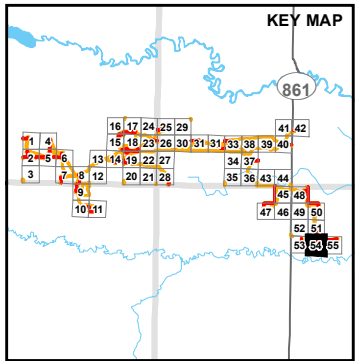
TITLE
QUARTER SECTION: SW 26-39-14 W4M

CONSULTANT	YYYY-MM-DD	2023-09-15
DESIGNED	SC	
PREPARED	LB	
REVIEWED	SC	
APPROVED	SC	

PROJECT NO. 21452763 PHASE REV. 0 FIGURE 53



LEGEND		ENVIRONMENTAL CONSTRAINTS		WETLAND AND WATER BODY PERMANENCE		WEED OBSERVATION	
—	CADASTRAL	▨	AREA OF FOOTPRINT INTERACTION/MITIGATION (SEE NOTES)	■	EPHEMERAL (CLASS I) WATER BODY	●	NOXIOUS WEED SPECIES OBSERVATION
—	LOCAL ROAD	▨	WETLAND SETBACK (5 m) INTERACTION (Silt fencing between the Project Footprint and wetland when work cannot be scheduled during dry or frozen periods.)	■	TEMPORARY (CLASS II) WETLAND		
■	NATIVE GRASSLAND	▨	WETLAND (CLASS III+) SETBACK (100 m) INTERACTION	▨	SEASONAL (CLASS III) WETLAND		
●	PROJECT LAYOUT	▨	WETLAND (CLASS III+) SETBACK (100 m) INTERACTION	▨	WETLAND (CLASS III+) SETBACK (100 m)		
○	TURBINE	▨	WILDLIFE HABITAT FEATURES	▨	WETLAND SETBACK (5 m)		
○	ROTOR-SWEPT AREA	▨	NEST SETBACK				
—	UNDERGROUND COLLECTOR SYSTEM	○	ACTIVE				
—	CRANE PATH	●	RAPTOR NEST				
—	OPERATION FOOTPRINT						
—	CONSTRUCTION FOOTPRINT						



NOTE 1 - Raptor Nest Interactions:

NA

NOTE 2 - Direct Wetland or Ephemeral Waterbody Interactions (Class I, II, III, IV and V):

Direct impacts to wetlands can not extend beyond the Project Footprint and as outlined in this plan. Wetland boundaries between the Project footprint and wetland will be marked before construction start, and silt fencing will be installed to prevent vehicle traffic from entering wetlands that extend outside of the footprint when work cannot be scheduled under dry or frozen conditions. Plan construction during dry ground conditions to the extent possible, and use rig matting, geotextiles, vegetated buffer zones, earthen berms as appropriate. Wetlands temporarily disturbed will naturally regenerate from seeds present in the soil and from adjacent areas. Plan construction outside of the sensitive amphibian breeding period or implement mitigations for amphibians when intersecting Class III, IV or V (Refer to Note 4).

NOTE 3 - Wetlands within 5 m of the Footprint (Ephemeral waterbodies, drainages, Class II and higher):

Wetlands, ephemeral water bodies and drainages within 5 m of the Project Footprint will be marked prior to construction. Silt fencing will be installed between the wetland and the nearest edge of the Project Footprint if construction cannot be scheduled during dry or frozen conditions. The Environmental Monitor may require additional silt fencing as required based on site conditions. Alternatively, the Environmental Monitor may determine silt fencing is not needed based on the distance of the wettest edge to the Project Footprint.

NOTE 4 - Within 100 m of a Class III, IV, or V (Amphibians and Waterbirds):

Schedule construction outside of the amphibian active period (i.e., breeding period and post-breeding period to first frost, approximately April 15 to September 15). When construction within 100 m wetlands setbacks with the potential to support amphibian populations cannot be scheduled outside the amphibian active period (April 15 to September 15), a pre-construction amphibian survey will be conducted. If the pre-construction amphibian survey confirms the presence of amphibians, exclusion fencing will be installed and maintained along the nearest edge of the Project Footprint. An experienced wildlife biologist or qualified environmental monitor will conduct an amphibian salvage program, if required. Nest searches will be performed within the 100 m setback by an experienced wildlife biologist, to identify breeding birds or their nests if construction is scheduled between April 1 and August 28. If breeding activity is identified, an appropriate setback buffer will be applied.

NOTE 5 - Direct Wetland Interactions - Class IV Collector Line Crossings:

NA

GENERAL NOTE - All non cultivated areas within 100 m of construction activities:

Schedule construction outside of recommended restricted activity periods (April 1 to August 28) within all non-cultivated habitats. If construction activities occur between April 1 and August 28, non-intrusive, pre-construction nest surveys will be performed an experienced wildlife biologist within 100 m of construction activity prior to construction. If breeding activity is identified, a minimum setback buffer of 100 m will be applied to the suspected nest location until young fledge to minimize the risk of disturbing birds, nests, or eggs. When there is potential for construction activities to pose an elevated risk to wildlife, an experienced wildlife biologist will be on site to monitor wildlife behaviour and to propose on site mitigation actions that should be implemented to reduce risk to wildlife.

GENERAL NOTE - Vegetation Clearing:

Vegetation clearing will be limited to the Project Footprint and the smallest area practicable. Where possible, short shrub species will be "walked down" or simply driven over to preserve the growth crown and root network, thereby enhancing regeneration after construction is complete. Plan vegetation clearing in all non-cultivated habitats outside of the restricted activity period (April 1 – August 28) to the extent possible (refer to General Note – all non-cultivated areas within 100 m of construction activities).

GENERAL NOTE - Clubroot and Weeds:

All vehicles and construction equipment will be clean (i.e., free of soils and vegetative debris) and disinfected (and documented) prior to arrival at the Project area and cleaned prior to leaving the Project area. All vehicles and equipment will be physically cleaned to remove soil and crop debris before traversing between fields as identified by the land agent or Environmental Monitor. Choose low traffic grassy areas near the field exit to complete cleaning when possible. Remove soil and crop debris by knocking or scraping off soil lumps and sweeping loose soil and vegetation from all equipment, vehicles, or tools used during project activities. Compressed air can be used to blow off any residue left on the machinery after scraping. A pressure washer should be used to remove soil and vegetation if the equipment was operated during wet conditions. Salvaged soil materials will not be moved between different sites. Areas that exhibit extensive weed infestations prior to disturbance will have soils salvaged and stockpiled separately to prevent the contamination of larger reclamation soil volumes.

GENERAL NOTE - Turbine Foundation:

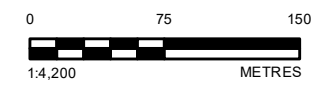
Mortality due to foundation construction activities, while not expected, may occur if wildlife falls into or becomes trapped within foundation excavations. To prevent wildlife from inadvertently falling in, open excavations or auger holes will be temporarily fenced off. Open excavations or auger holes left unsupervised will be checked daily to ensure no wildlife is trapped.

Category	Applicability	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
Raptor Nest Breeding Period	Raptor Nests and Setbacks			Wildlife Monitor Required when working in Setback									
				15-Mar				15-Jul					
Grassland Breeding Bird Nesting Period (April 1- July 15) and Migratory Bird Nesting Period, Nesting Zone B4 (April 14 - August 28)	All non cultivated areas within 100 m of construction activity.			Nest Sweep Required									
					1-Apr				28-Aug				
Amphibian Active Period (April 15 - September 15)	Direct impacts to Class III, IV and V wetlands, or work within 100 m setbacks of Class III, IV and V wetlands				Pre-Construction Amphibian Survey, Silt Fencing and Amphibian Monitoring Required as per Referral Report*		Pre-Construction Amphibian Survey, Silt Fencing and Amphibian Monitoring Recommended*						
					15-Apr		14-Jun			15-Sep			

*It is recommended that best practices for amphibian mitigation are applied during the frost-free season from about April to September 15.

REFERENCE(S)
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 2. 2018 ORTHOPHOTO OBTAINED FROM TARIN RESOURCE SERVICES LTD.

PROJECTION: UTM ZONE 12 DATUM: NAD 83



CLIENT **Capital Power**

PROJECT **HALKIRK 2 WIND POWER PROJECT**

TITLE **QUARTER SECTION: SE 26-39-14 W4M**

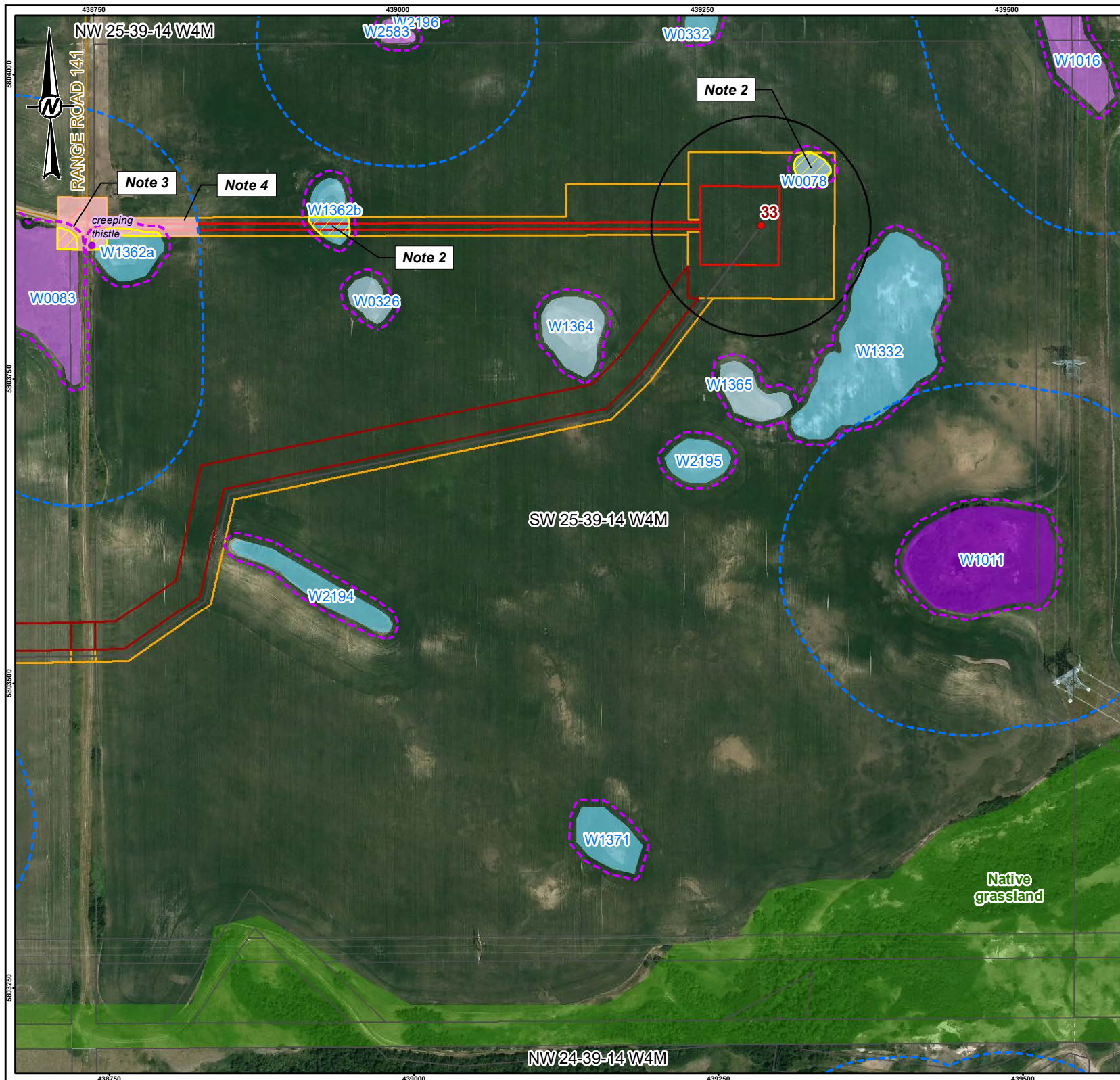
CONSULTANT

YYYY-MM-DD	2023-09-15
DESIGNED	SC
PREPARED	LB
REVIEWED	SC
APPROVED	SC

PROJECT NO. **21452763** PHASE REV. **0** FIGURE **54**

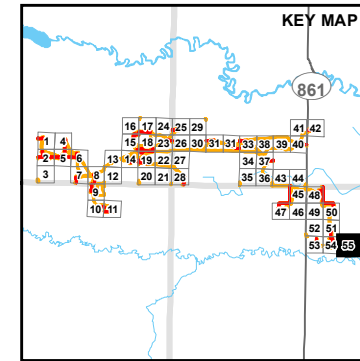
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IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B



LEGEND

- CADASTRAL
- LOCAL ROAD
- NATIVE GRASSLAND
- PROJECT LAYOUT**
 - TURBINE
 - ROTOR-SWEPT AREA
 - UNDERGROUND COLLECTOR SYSTEM
 - CRANE PATH
 - OPERATION FOOTPRINT
 - CONSTRUCTION FOOTPRINT
- ENVIRONMENTAL CONSTRAINTS**
 - AREA OF FOOTPRINT INTERACTION/MITIGATION (SEE NOTES)
 - WETLAND SETBACK (5 m) INTERACTION (Silt fencing between the Project Footprint and wetland when work cannot be scheduled during dry or frozen periods.)
 - WETLAND (CLASS III+) SETBACK (100 m) INTERACTION
- WETLAND AND WATER BODY PERMANENCE**
 - EPHEMERAL (CLASS I) WATER BODY
 - TEMPORARY (CLASS II) WETLAND
 - SEASONAL (CLASS III) WETLAND
 - SEMI-PERMANENT (CLASS IV) WETLAND
 - WETLAND (CLASS III+) SETBACK (100 m)
 - WETLAND SETBACK (5 m)
- WEED OBSERVATION**
 - NOXIOUS WEED SPECIES OBSERVATION



NOTE 1 - Raptor Nest Interactions:
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PROJECTION: UTM ZONE 12 DATUM: NAD 83

CLIENT **Capital Power**

PROJECT **HALKIRK 2 WIND POWER PROJECT**

TITLE **QUARTER SECTION: SW 25-39-14 W4M**

CONSULTANT

YYYY-MM-DD	2023-09-15
DESIGNED	SC
PREPARED	LB
REVIEWED	SC
APPROVED	SC

PROJECT NO. 21452763 PHASE REV. 0 FIGURE 55

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APPENDIX D

EPEA Release Reporting Regulation



Province of Alberta

ENVIRONMENTAL PROTECTION AND
ENHANCEMENT ACT

RELEASE REPORTING REGULATION

Alberta Regulation 117/1993

With amendments up to and including Alberta Regulation 153/2021

Current as of June 30, 2021

Office Consolidation

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Note

All persons making use of this consolidation are reminded that it has no legislative sanction, that amendments have been embodied for convenience of reference only. The official Statutes and Regulations should be consulted for all purposes of interpreting and applying the law.

(Consolidated up to 153/2021)

ALBERTA REGULATION 117/93
Environmental Protection and Enhancement Act
RELEASE REPORTING REGULATION

Table of Contents

- 1 Definition
- 2 Exemption from reporting
- 3 Substances regulated by federal Act
- 3.1 Reporting release by electronic means
- 4 Written report
- 4.2 Expiry

Schedule

Definition

1 In this Regulation, “Act” means the *Environmental Protection and Enhancement Act*.

Exemption from reporting

2 Sections 110 and 111 of the Act and this Regulation do not apply

- (a) to releases of substances that are regulated by the *Oil and Gas Conservation Act* or any regulation made under that Act, the *Dangerous Goods Transportation and Handling Act* or any regulation made under that Act, or an approval, licence or permit granted under any of those Acts or regulations, or
- (b) to releases of substances classified as Class 1 dangerous goods (explosives) or Class 7 dangerous goods (radioactive materials) as set out in the Schedule to the *Transportation of Dangerous Goods Act, 1992* (Canada).

AR 117/93 s2;217/96;251/2001;386/2003;136/2018

Substances regulated by federal Act

3(1) Subject to section 2(a), where a release of a substance falling within a Class set out in the first column of the Schedule to this Regulation occurs and the release has caused, is causing or may

cause an adverse effect, sections 110 to 112 of the Act and this Regulation apply in respect of the release only if

- (a) the release is at or in excess of the quantity or emission levels set out for the substance in the second column of the Schedule, or
- (b) the substance is released into a watercourse or into groundwater or surface water.

(2) Subsection (1)(b) applies regardless of whether the quantity or emission level of the release is at or in excess of the levels set out for the substance in the second column of the Schedule.

AR 117/93 s3;247/93;217/96;251/2001;386/2003;127/2017

Reporting release by electronic means

3.1(1) A person reporting under section 111(1) of the Act by electronic means shall make the report through the electronic reporting system provided by the Department.

(2) No person shall interfere with the operation of the reporting system referred to in subsection (1).

AR 153/2021 s2

Written report

4(1) A person referred to in section 110(2) of the Act who makes a report under section 111(1) of the Act by telephone or by electronic means shall within 7 days ensure that the Director is in receipt of a written report made by the person in accordance with subsection (3).

(2) The Director may, on the request of the person reporting under section 111(1) of the Act, waive the requirement of subsection (1) of this section where, in the Director's opinion, the report provided under section 111(1) of the Act is satisfactory and

- (a) no adverse effects are likely to occur as a result of the release, or
- (b) the adverse effects caused by the release have been adequately controlled.

(3) A written report must include the following information, where reasonably available:

- (a) the date and time of the release;
- (b) the location of the point of the release;
- (c) the duration of the release and the release rate;

- (d) the composition of the release showing with respect to each substance
 - (i) its concentration, and
 - (ii) the total weight, quantity or amount released;
- (e) a detailed description of the circumstances leading up to the release;
- (f) the steps or procedures which were taken to minimize, control or stop the release;
- (g) the steps or procedures which will be taken to prevent similar releases;
- (h) any other information required by the Director.

(4) Where the Director receives a written report the Director may require, by written notice given to the person who submitted the report, the submission of additional information specified in the notice by the time specified in the notice.

(5) A person who receives a notice under subsection (4) shall comply with it in accordance with its terms.

AR 117/93 s4;251/2001;386/2003

4.1 Repealed AR 153/2021 s3.

Expiry

4.2 For the purpose of ensuring that this Regulation is reviewed for ongoing relevancy and necessity, with the option that it may be repassed in its present or an amended form following a review, this Regulation expires on June 30, 2026.

AR 386/2003 s5;122/2013;64/2015;127/2017;136/2018;
153/2021

5 Repealed AR 386/2003 s6.

Schedule


Reportable Levels for Certain Substances

1 In this Schedule:

“Federal Regulations” means the *Transportation of Dangerous Goods Regulations* (SOR/2016-95) made under the *Transportation of Dangerous Goods Act* (Canada);

Class	Quantity
Class 2: Gases, referred to in section 2.13(a) of the Federal Regulations	Any quantity that could pose a danger to public safety or any sustained release of 10 minutes or more
Class 3: Flammable liquids and combustible liquids, referred to in section 2.18 of the Federal Regulations	200 L
Class 4: Flammable solids, substances liable to spontaneous combustion, substances that on contact with water emit flammable gases (water-reactive substances), referred to in section 2.20 of the Federal Regulations	25 kg
Class 5.1: Oxidizing substances, referred to in section 2.24(a) of the Federal Regulations	50 kg or 50 L
Class 5.2: Organic peroxides, referred to in section 2.24(b) of the Federal Regulations	1 kg or 1 L
Class 6.1: Poisonous (toxic) substances, referred to in section 2.27(a) of the Federal Regulations	5 kg or 5 L
Class 6.2: Infectious substances, referred to in section 2.27(b) of the Federal Regulations	Any quantity
Class 8: Corrosives, referred to in section 2.40 of the Federal Regulations	5 kg or 5 L
Class 9: Miscellaneous products, substances or organisms, referred to in section 2.43 of the Federal Regulations	25 kg or 25 L



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APPENDIX E

EPEA Release Reporting Guide

To report a spill or
environmental emergency
call **1-800-222-6514**



A GUIDE TO RELEASE REPORTING

Alberta Environmental Protection and Enhancement Act

Alberta Environment Regional Offices

NORTHERN REGION

Edmonton
#111, Twin Atria Building
4999-98 Avenue
Edmonton, Alberta T6B 2X3
Tel: 780.427.7617
Fax: 780.427.7824

CENTRAL REGION

Red Deer
#304, Provincial Building
4920-51 Street
Red Deer, Alberta, T4N 6K8
Tel: 403.340.7052
Fax: 403.340.5022

SOUTHERN REGION

Calgary
#303, Deerfoot Square Building
2938-11 Street NE
Calgary, Alberta, T2E 7L7
Tel: 403.297.7880
Fax: 403.297.6069

To contact your local Alberta Environment office,
call the regional office nearest you or dial 310-0000.

Alberta

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REFERENCES

Environmental Protection and Enhancement Act,
R.S.A. 2000, c. E-12 (as amended)

Release Reporting Regulation,
A. R. 117/93 (as amended)

Transportation of Dangerous Goods Regulations (SOR 2001 - 286) under the
Transportation of Dangerous Goods Act,
1992, S.C. 1992, c. 34

Dangerous Goods and Handling Act,
R.S.A. 2000. D-4 (as amended)

Oil and Gas Conservation Act,
R.S.A. 2000, c. 0-6 (as amended)

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How to report	5
What does not have to be reported	8
What happens after a report	11
Frequently asked questions	12
Legislation	17
Definitions	21
References	23

Substance

- (i) Any matter that
 - (a) Is capable of becoming dispersed into the environment, or
 - (b) Is capable of becoming transformed in the environment into matter referred to in paragraph (a)
- (ii) Any sound, vibration, heat, or radiation or other form of energy, and
- (iii) Any combination of things referred to in subclauses (i) and (ii)

Additional definitions can be found in the *Environmental Protection and Enhancement Act* and the *Release Reporting Regulation*. These sources should be consulted to assist in the interpretation of the reporting obligations.

This guide is not a substitute for the law. Please consult the *Environmental Protection and Enhancement Act* and the *Release Reporting Regulation* for all purposes of interpreting and applying the law.

In the event of a difference between this guide and the Act or Regulation, the Act or Regulation prevails.

DEFINITIONS

Adverse effect

Impairment of or damage to the environment, human health or safety, or property.

Environment

The components of the earth including:

- (i) Air, land and water
- (ii) All layers of the atmosphere
- (iii) All organic and inorganic matter and living organisms
- (iv) The interacting natural systems that include components referred to in clauses (i) to (iii)

Owner of a substance

The owner of the substance immediately before or during the release of the substance.

Person having control of a substance

The person having charge, management or control of the substance.

Release

Includes to spill, discharge, dispose of, spray, inject, inoculate, abandon, deposit, leak, seep, pour, emit, empty, throw, dump, place and exhaust.

INTRODUCTION

This guide is designed to clarify the reporting requirements contained in the *Environmental Protection and Enhancement Act* and the *Release Reporting Regulation*.

The *Environmental Protection and Enhancement Act* requires that any release of a substance into the environment that could cause an adverse effect be reported to Alberta Environment.

The *Release Reporting Regulation* sets out what must be reported, when, how and to who reports must be made.

Individual approvals and codes of practice may also have requirements for reporting contraventions of the terms and conditions of an approval or code of practice, monitoring results and sampling programs. Please consult your approval or registration, or contact Alberta Environment, if you have questions about these reporting requirements.

WHEN TO REPORT A RELEASE

Any spill, release or emergency that **may** cause, **is** causing or **has** caused an adverse effect to the environment must be immediately reported to Alberta Environment.

Prompt reporting assists in ensuring adverse impacts are addressed properly and minimized if possible, and directly affected parties are notified.

As an adverse effect may be difficult to determine, depending on the chemical and physical characteristics of the substance released and where it was released, if you are uncertain about the potential for adverse effects it is recommended that you report the release.

Releases can occur quickly, or over a long period of time. Numerous small releases can result in a potential adverse effect even if the individual release itself may not.

To be reportable, the release must be into the environment. For example, a spill that is fully contained within a building, including odours, is not considered a release into the environment. However, if there is any possibility of odours venting from the building into the environment, Alberta Environment should be notified.

- (a) the release is at or in excess of the quantities or emission levels set out for the substance in the Table in section 8.1(1) of Part 8 of the *Transportation of Dangerous Goods Regulations* (SOR 2001-286), or
- (b) the substance is released into a watercourse or into groundwater or surface water.

3(2) Subsection (1)(b) applies regardless of whether the quantity or emission level of the release is at or in excess of the levels set out for the substance in the Table in section 8.1(1) of Part 8 of the *Transportation of Dangerous Goods Regulations* (SOR 2001-286).

The Release Reporting Regulation

Notice should be taken of sections 2 and 3 of the Regulation which state:

- 2 Sections 110 to 112 of the Act and this Regulation do not apply
- (a) to releases of substances that are regulated by the *Oil and Gas Conservation Act* or any regulation made under that Act, the *Dangerous Goods Transportation and Handling Act* or any regulation made under that Act, or an approval, licence or permit granted under any of those Acts or regulations, or
 - (b) to releases of substances classified as Class 1 dangerous goods (explosives) or Class 7 dangerous goods (radioactive materials) as set out in the Schedule to the *Transportation of Dangerous Goods Act, 1992* (Canada).
- 3(1) Subject to section 2(a), where a release of a substance falling within the Class set out in the first column of the Table in section 8.1(1) of Part 8 of the *Transportation of Dangerous Goods Regulation* (SOR 2001-286) under the *Transportation of Dangerous Goods Act, 1992* (Canada) occurs and the release has caused, is causing, or may cause an adverse effect, sections 110 to 112 of the Act and this Regulation apply in respect of the release only if

WHO SHOULD REPORT

You must report a release if you are:

- The person who releases, causes or permits the release of the substance
- The person having control of the substance that is released (unless they have reasonable grounds to believe that the release has already been reported)
- A police officer or employee of a local or public authority who is informed of, or who investigates, a release of a substance (unless they have reasonable grounds to believe it has already been reported)
- Anyone becoming aware of the release

Local authorities should establish appropriate training and response systems and immediately notify Alberta Environment of releases.

HOW TO REPORT

Report Immediately

Releases must be reported to Alberta Environment at the **first available opportunity**, as soon as the person responsible knows, or should know, about the release. Reports can be made:

- By phoning **1-800-222-6514** (toll-free, 24 hours-a-day) or (780) 422-4505 or
- In person at any Alberta Environment office

Electronic reporting may also be available in some areas. For further information please contact Alberta Environment.

What to Report

When reporting, please provide:

- The location and time of the release
- A description of the circumstances leading to the release
- The type and quantity of substance released
- The details of any action proposed or taken at the release site
- A description of the immediate surrounding area

A reference number will be issued to confirm that the report was made.

- (3) A police officer or employee of a local authority or other public authority who is informed of or who investigates a release of a substance into the environment that may cause, is causing or has caused an adverse effect shall immediately notify the Director of the release unless the police officer or employee has reasonable grounds to believe that it has been reported by another person.

Section 111 contains the directions for the manner of reporting where a person is required to report under section 110 and may include reports in person, in writing, and by electronic means. Section 112 states that it is the duty of the person responsible for the substance to take remedial measures to remedy the release and restore the environment.

Section 107(2) of EPEA states that "Sections 110 to 112 apply only to releases of substances that are not authorized by an approval or the regulations." For example, if there was a release of a substance specifically authorized by an approval, registration or the regulations the duty to report will not apply.

LEGISLATION

Environmental Protection and Enhancement Act Section 110 of EPEA states:

- 110(1) A person who releases, causes or permits the release of a substance into the environment that may cause, is causing or has caused an adverse effect shall, as soon as that person knows or ought to know of the release, report it to
- (a) the Director
 - (b) the owner of the substance, where the person reporting knows or is readily able to ascertain the identity of the owner,
 - (c) any person to whom the person reporting reports in an employment relationship,
 - (d) the person having control of the substance, where the person reporting is not the person having control of the substance and knows or is readily able to ascertain the identity of the person having control, and
 - (e) any other person who the person reporting knows or ought to know may be directly affected by the release.
- (2) The person having control of a substance that is released into the environment that may cause, is causing or has caused an adverse effect shall, immediately upon becoming aware of the release, report it to the person referred to in subsection (1)(a), (b), (c) and (e) unless the person having control has reasonable grounds to believe that those persons already know of the release.

Other Required Reporting

You must also report to the following people unless you know that they are already aware of the release:

- The owner or person with control of the substance (if you know or can find out who it is)
- Your employer, supervisor or manager
- Any other person who you know, or should know, may be directly affected by the release

Written Reports

The person responsible must submit a written report to the Alberta Environment Director within **seven days** of the initial immediate report.

The Director may waive the requirement for a written report if the immediate report was sufficient and no adverse effects are likely from the release. You may request a waiver at the time that the initial report is being made. **Unless and until the Director has granted a waiver, you must submit a written report.**

Written reports can be faxed to
(780) 427-3178 or mailed to:

**Alberta Environment
Environmental Response Centre
111 Twin Atria Building
4999 - 98 Avenue
Edmonton, AB T6B 2X3**

What Should be Included in a Written Report

Written reports should include:

- The date and time of the release
- The location of the release
- The duration of the release and the release rate
- The composition of the release for each substance, including:
 - concentration
 - total weight, quantity or amount released
- A detailed description of the circumstances leading up to the release
- The steps or procedures which were taken to minimize, control or stop the release
- The steps or procedures which will be taken to prevent similar releases
- Any other information required by the Director

What are the reportable limits for a release of polychlorinated biphenyl (PCBs)?

Any release containing concentrations greater than 50 parts per million, or any release that has had, or may have, an adverse affect should be reported. In addition to Alberta Environment reporting requirements, the federal government also has reporting requirements for PCBs.

My vehicle was involved in an accident and as a result fuel was spilled on the ground. Do I need to report this to Alberta Environment?

Typically motor vehicle accidents are reported to a local authority. However, if the quantity of the spill exceeds 200 L, or the fuel has had, or may have an adverse effect, it must immediately be reported to Alberta Environment either by the local authority, or the person(s) involved with the spill.

We spilled a product on the plant site and it has been fully contained. However, the product odours may drift off the site. Do I need to report this to Alberta Environment?

Yes. The odours have a potential to cause an adverse effect and must immediately be reported to Alberta Environment.

My company stores 205 L drums of used oil (a hazardous recyclable) in our yard. One of the drums was accidentally knocked over and the contents were spilled on the ground and soaked into the gravel. Should I report this to Alberta Environment?

Yes. The spill has the potential to have an adverse effect on the groundwater or leave the site. This spill must immediately be reported to Alberta Environment.

I own a service station in an industrial area that borders a residential neighborhood. While removing underground gasoline and diesel storage tanks, I discovered there was free product in the excavation. Is this reportable?

Yes. There is a potential that groundwater aquifers and adjoining residential properties could be affected. In addition, if there are public safety concerns, the local fire department must be notified.

WHAT DOES NOT HAVE TO BE REPORTED

Releases of the following substances do not have to be reported to Alberta Environment, but reporting to other agencies may be required:

- Substances released according to conditions in an approval, registration or regulation
- Substances regulated by the *Oil and Gas Conservation Act*, the *Dangerous Goods Transportation and Handling Act* or any regulations under those Acts
- Substances regulated by an approval, licence or permit granted under the *Oil and Gas Conservation Act*, the *Dangerous Goods Transportation and Handling Act* or any regulations under those Acts
- Substances classified as Class 1 (explosives) or Class 7 (radioactive materials) dangerous goods as set out in the *Transportation of Dangerous Goods Act, 1992* (Canada)

The class and division of substances regulated under the *Transportation of Dangerous Goods Act* and Regulation, and reportable quantities or levels, is available from Alberta Transportation by calling 1-800-272-9600 or (780) 422-9600.

The release of these substances is reportable when:

- The release has caused, is causing or may cause an adverse effect
- The amount exceeds the quantities or emission levels set out for the substance
- The release is into a watercourse or into the groundwater or surface water in any quantity
- The release falls under the *Transportation of Dangerous Goods Regulation Table 1* under the *Transportation of Dangerous Goods Act, 1992* (Canada)

If you cannot tell if the quantities or levels listed in the *Transportation of Dangerous Goods Regulation Table 1* are exceeded, the release should be reported.

I was loading a truck with crude oil at a lease site and overfilled the tank, which resulted in approximately 500 L of crude oil being spilled on the ground. The product was contained and will be vacuumed up and no crude oil went off-site or into any waterway. Do I need to report this to Alberta Environment?

No. However, this may be reportable to the Alberta Energy and Utilities Board. *Alberta Energy and Utilities Board IL 98-1 Oil and Gas Notification Requirements* are:

- Any release greater than 2 m³ on-lease
- Any release off-lease as per the *Oil and Gas Conservation Regulations*
- Any release that has entered or has potential to enter surface water

Any spill or release that goes off-lease that has caused, is causing, or may cause an adverse effect, must immediately be reported to Alberta Environment.

My company repaired an air conditioning system and discovered a broken line that allowed the release of HCFC-22 (R-22). We repaired the line and recharged the system. Do we need to report this release to Alberta Environment?

Alberta Environment only requires immediate reporting of releases 10 kg or greater of Ozone-Depleting Substances, as listed in the *Ozone-Depleting Substances and Halocarbons Regulation, Alberta Regulation 181/2000*.

Our facility is going into a shutdown and as a result we will be required to do some additional flaring. Do we need to report this to Alberta Environment?

If the flaring causes dense black smoke of an opacity greater than 40 per cent for six minutes or more, or if the flaring exceeds an approval limit or has had, or may have, an adverse effect, it must immediately be reported to Alberta Environment. In the event none of these criteria have been exceeded but public complaints could result, please notify Alberta Environment in advance, if possible.

Table Identified in Section 8.1(1) of Part 8 of the Transportation of Dangerous Goods Regulation		
Class	Quantity	Emission Limit
1.	Any quantity that could pose a danger to public safety or 50 kg	
2.	Any quantity that could pose a danger to public safety or any sustained release of 10 minutes or more	
3.	200 L	
4.	25 kg	
5.1	50 kg or 50 L	
5.2	1 kg or 1 L	
6.1	5 kg or 5 L	
6.2	Any quantity that could pose a danger to public safety or 1 kg or 1 L	
7	Any quantity that could pose a danger to public safety	An emission level greater than the emission level established in section 20 of the <i>Packaging and Transport of Nuclear Substances Regulations</i>
8	5 kg or 5 L	
9	25 kg or 25 L	

WHAT HAPPENS AFTER A REPORT

Alberta Environment responds to all reports. The first priority is always to ensure that any possible adverse effects of a release are being properly dealt with, prevented if possible, or mitigated.

Alberta Environment also ensures all other appropriate authorities are notified and works with other agencies to ensure proper response efforts are underway.

After the situation is being appropriately managed and is under control, Alberta Environment gathers more information about the release incident to determine the cause of the release and how to prevent future releases.

Once the follow-up investigation is complete, a decision is made on whether enforcement action is necessary, and what that enforcement action should be.

Failure to report may result in enforcement action.

FREQUENTLY ASKED QUESTIONS

Do I have to report a spill of 30 L of varsol that occurred inside our warehouse but was contained and cleaned up?

No. If all the varsol was recovered and nothing entered the sanitary or storm drainage system the spill does not need to be reported. A spill inside a building that is fully contained within the building, including odours, is not considered a release into the environment. However, if there is any possibility of odours venting from the building, Alberta Environment should be notified.

I was digging a trench and struck a natural gas line and as a result there was a release of natural gas for a short period of time before the line could be shut-in. Do I need to report this to Alberta Environment?

If the natural gas release poses a danger to public safety or lasted for 10 minutes or more, or the release has had, or may have, an adverse effect, it must immediately be reported to Alberta Environment.

APPENDIX F

Soil and Vegetation Management Plan (SVMP)



REPORT

Soil and Vegetation Management Plan
Halkirk 2 Wind Power Project

Submitted to:

Capital Power Generating Services Inc.

Submitted by:

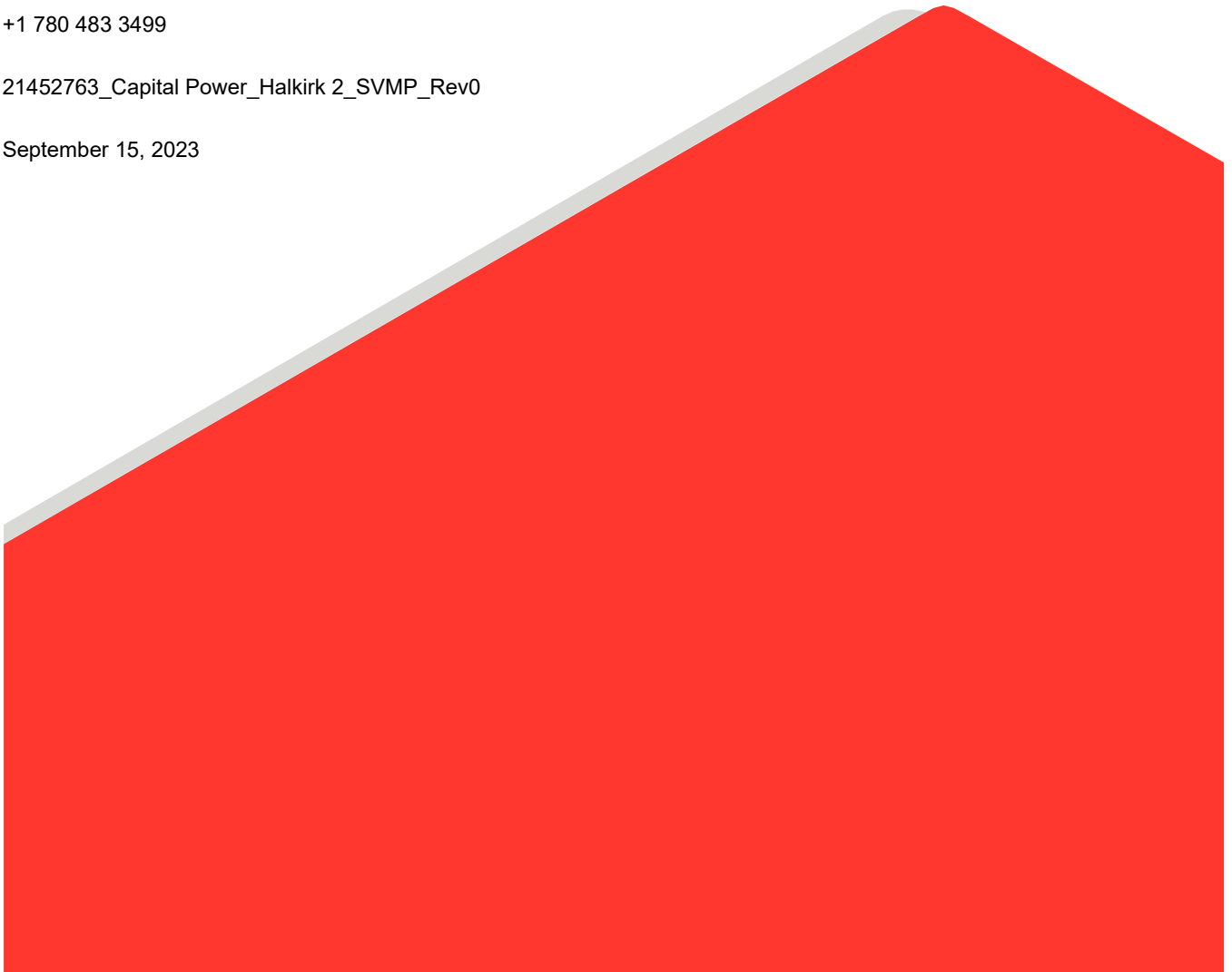
WSP Canada Inc.

16820 107 Avenue, Edmonton, Alberta, T5P 4C3, Canada

+1 780 483 3499

21452763_Capital Power_Halkirk 2_SVMP_Rev0

September 15, 2023



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21452763_Capital Power_Halkirk II_Draft Soil PDSA Results_RevA	Draft	V10	February 17, 2023	Soils Operational Mapping issued as a first draft
21452763_Capital Power_Halkirk 2_SVMP_RevA	Draft	V10	March 29, 2023	First draft issued by WSP
21452763_Capital Power_Halkirk 2_SVMP_RevB	Draft	V10	May 19, 2023	Second draft issued by WSP.
21452763_Capital Power_Halkirk 2_SVMP_Rev0	Final	V12 & Change to T19 Road Widening	September 15, 2023	Third version issued by WSP. Volume estimates and footprint updated to reflect change to V12 and a subsequent changes to the access road to T19. Minor changes to soil handing recommendations and clubroot mitigations to reflect AUC requirements. Appendix B updated.

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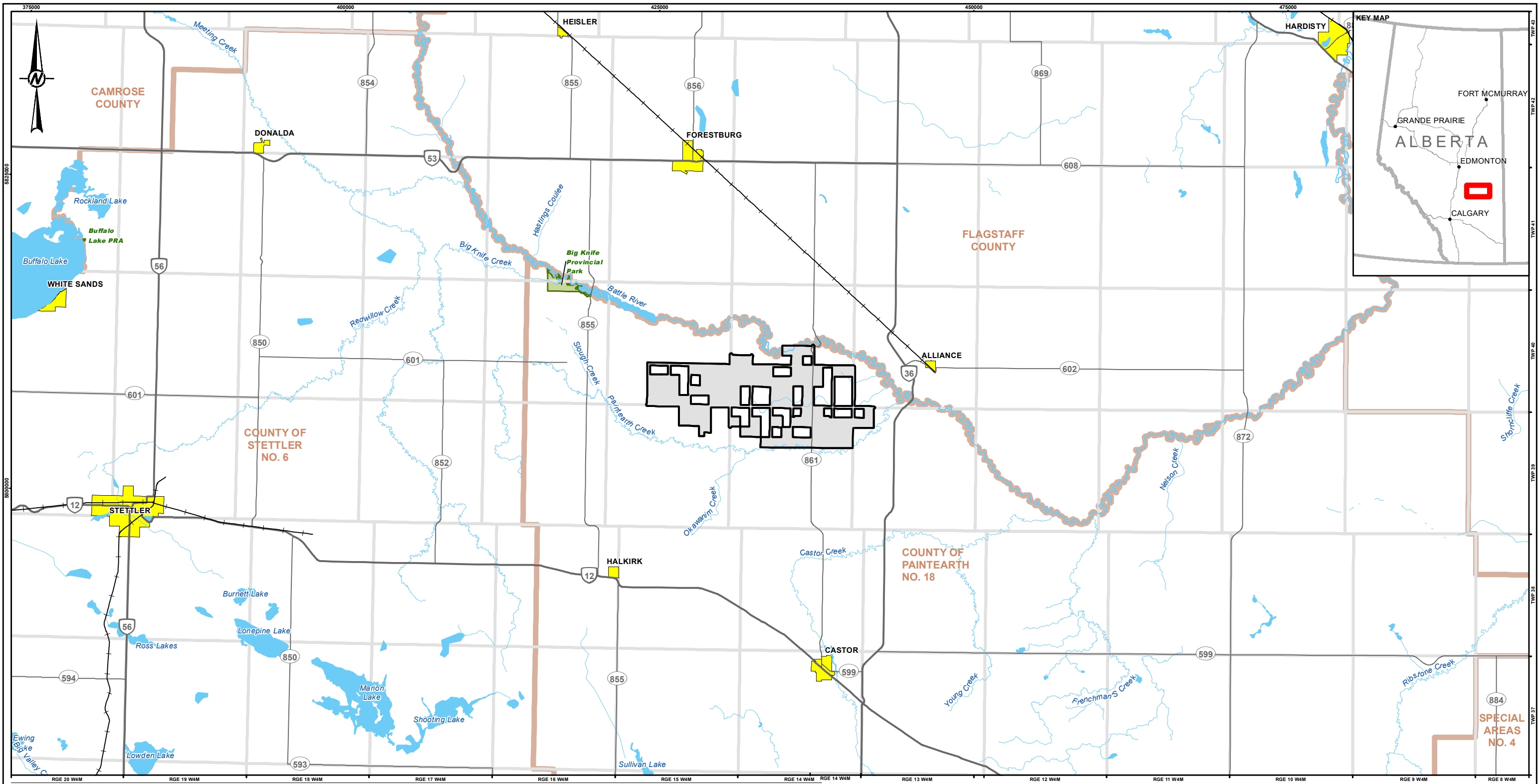
1.0 INTRODUCTION

Capital Power Generation Services Inc. as general partner for Capital Power (Halkirk 2) L.P. (Capital Power; the Proponent) engaged WSP Canada Inc. (WSP) to complete soil and vegetation Pre-Disturbance Site Assessments (PDSAs) and a Soil and Vegetation Management Plan (SVMP) for the Halkirk 2 Wind Power Project (the Project), as required by the *Conservation and Reclamation (C&R) Directive for Renewable Energy Operations* (the C&R Directive; Alberta Environment and Parks [AEP] 2018a). The Project is located within portions of Township 40 and 39, Ranges 14 and 15, west of the fourth meridian (W4M), in Alberta's Paintearth County, approximately 12 kilometres (km) northeast of Halkirk, Alberta (Figure 1).

The goal of an SVMP is to summarize pre-disturbance soil and vegetation conditions, and to provide recommendations that will increase the likelihood of reclamation success for lands affected by the Project. After construction and/or decommissioning, lands must be reclaimed and returned to a state of equivalent land capability (ELC), meaning that the affected lands must be capable of supporting a comparable land use to pre-disturbance conditions (GOA 2022a, AEP 2018a). This SVMP assumes that lands will be returned to the same land use as pre-disturbance conditions following decommissioning. Any proposed changes to end land use must be approved by Alberta Environment and Protected Areas (AEPA) prior to final reclamation (AEP 2018a).

This SVMP provides a summary of the environmental pre-disturbance conditions of the Project's limit of disturbance (LOD) using data collected from desktop assessments and soil and vegetation PDSAs, and a management plan for the construction and decommissioning phases of the Project (i.e., soil salvage, stockpiling, soil replacement, revegetation, and weed management) within the LOD.

The LOD is the maximum extent of physical disturbance during construction and decommissioning phases of the Project, and includes all Project components, excluding crane paths. For the purposes of this SVMP, the LOD has been divided into two areas of discussion based on methods that will be used during construction: the construction footprint and the underground collector system footprint. The construction footprint includes all permanent and temporary disturbance areas that will have topsoil and upper subsoil salvage, including turbine pads, access roads, the temporary laydown, and the substation. The underground collector system footprint includes all collector lines, which will be ploughed in or trenched, depending on the construction requirements of each collector line path. Crane paths are not included in this SVMP, as there is no planned ground disturbance for this component of the footprint. The total area of the LOD is 147.9 ha, and the construction footprint and underground collector system footprint occupy 103.3 ha and 44.6 ha, respectively. The LOD, construction footprint, underground collector system footprint, and PDSA inspection locations are displayed on Figure 2.



- LEGEND**
- PROJECT STUDY AREA
 - PRIMARY HIGHWAY
 - SECONDARY HIGHWAY
 - RAILROAD
 - WATERCOURSE
 - MUNICIPAL BOUNDARY
 - PARK / PROTECTED AREA
 - POPULATED PLACE
 - WATERBODY



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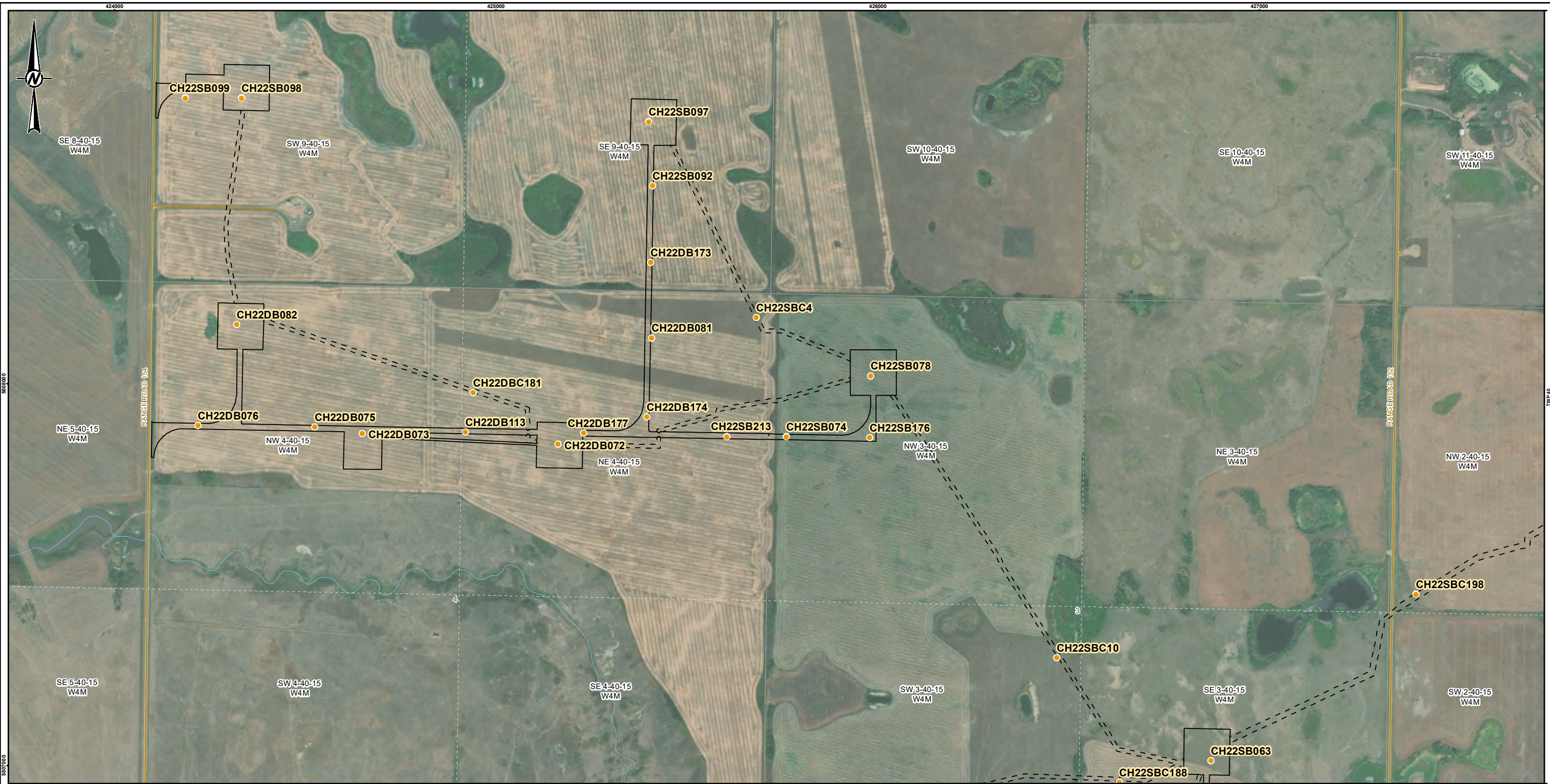
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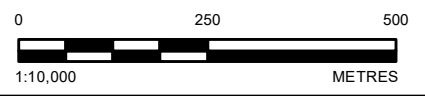
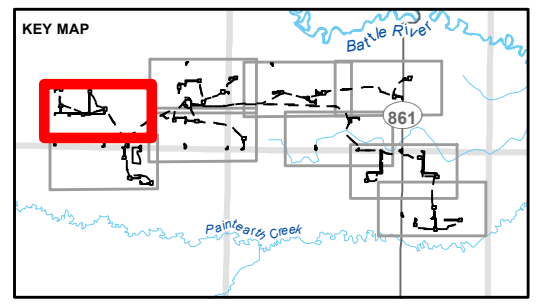
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- LEGEND**
- 2022 SOIL INSPECTION SITE
- FOOTPRINT BOUNDARY**
- FOOTPRINT (WITHOUT CRANE PATH)
 - - - UNDERGROUND COLLECTOR SYSTEM
- BASE FEATURES**
- LOCAL ROAD
 - WATERCOURSE



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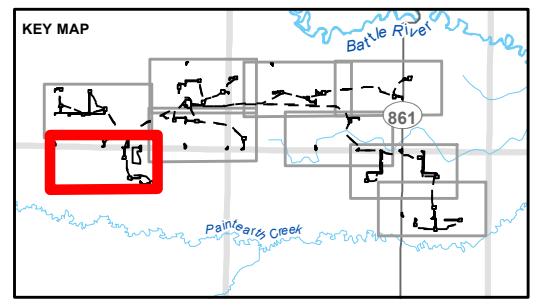
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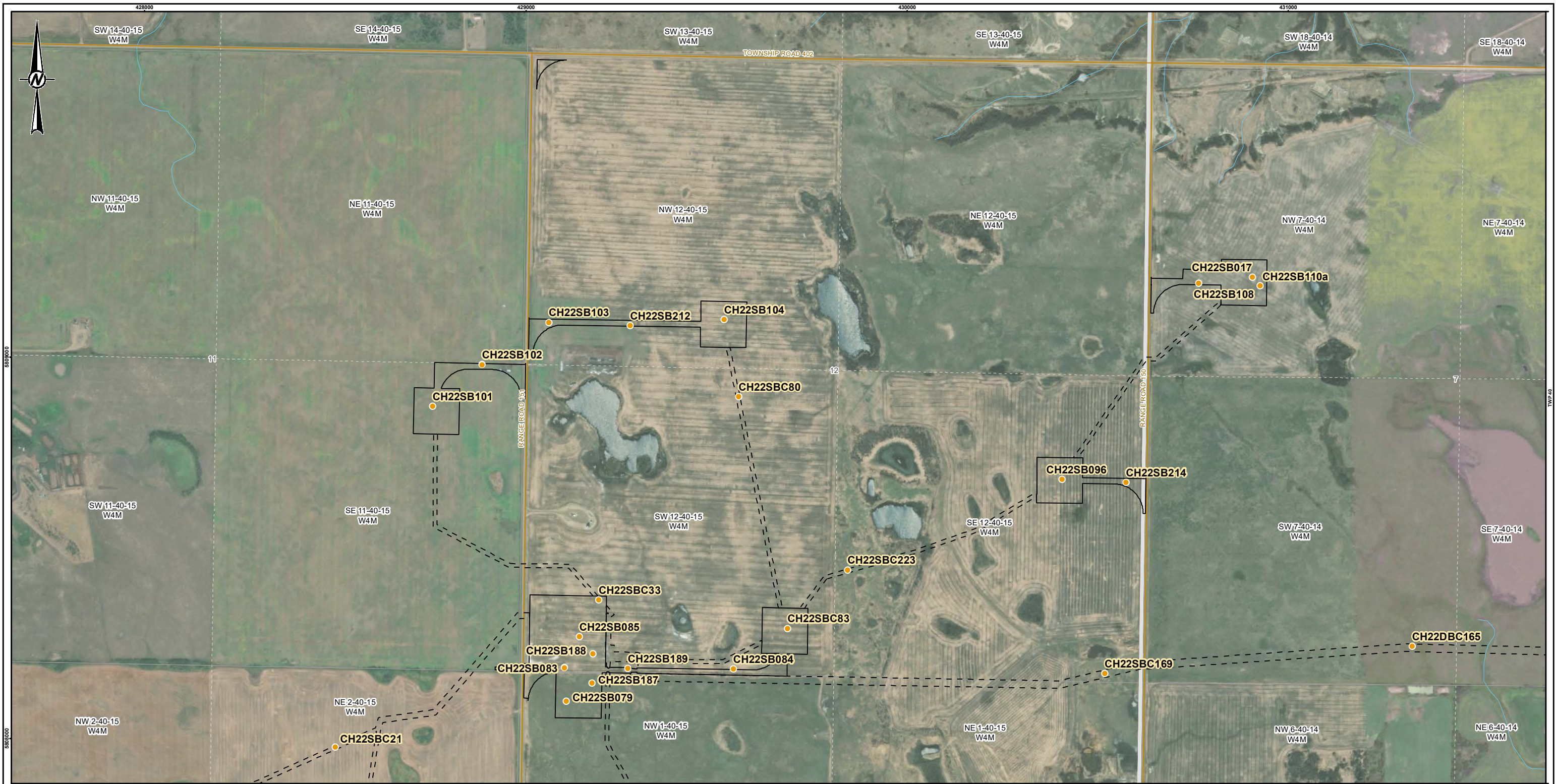
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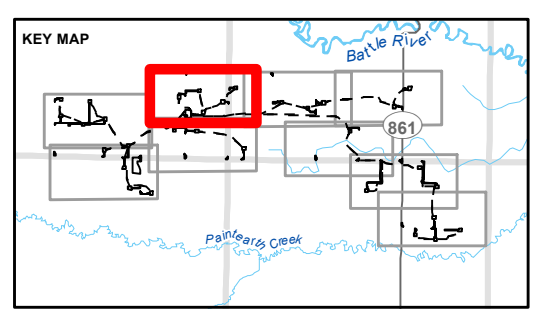
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 - BASE FEATURES**
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 - WATERCOURSE



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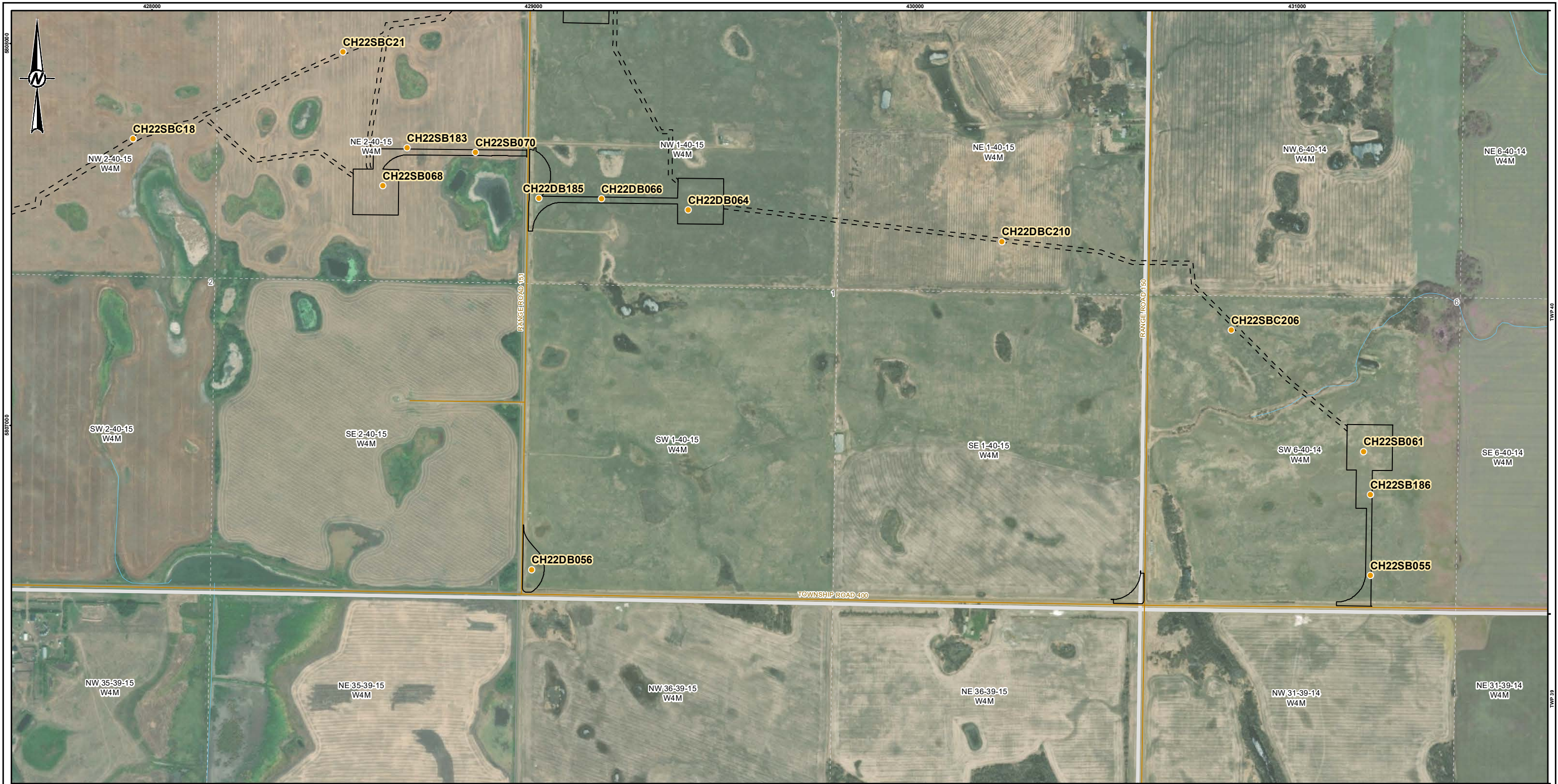
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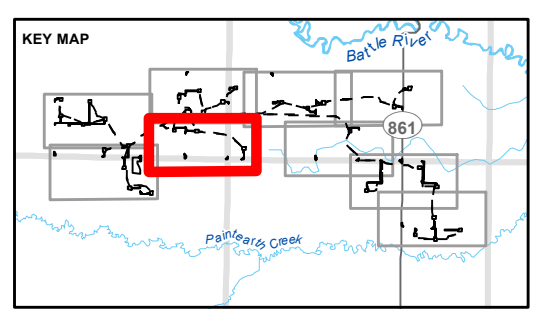
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- FOOTPRINT (WITHOUT CRANE PATH)
 - - - UNDERGROUND COLLECTOR SYSTEM
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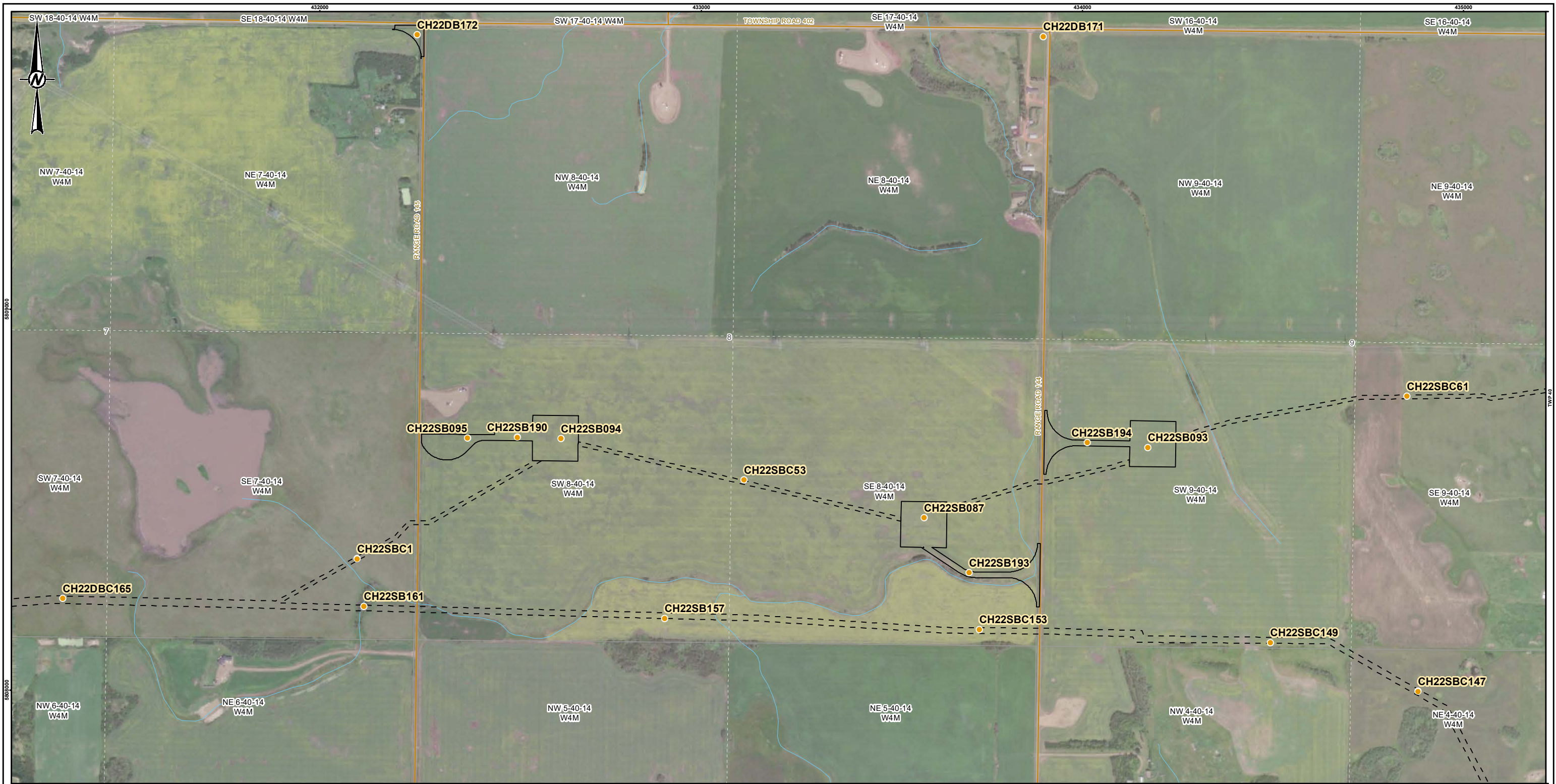
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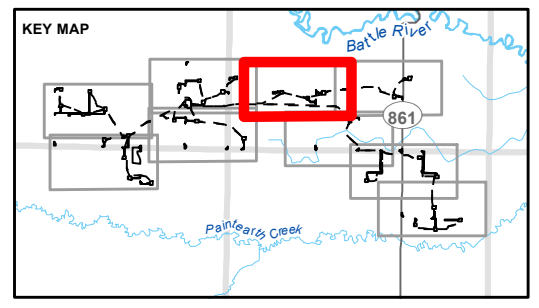
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- LEGEND**
- 2022 SOIL INSPECTION SITE
 - FOOTPRINT BOUNDARY**
 - FOOTPRINT (WITHOUT CRANE PATH)
 - - - UNDERGROUND COLLECTOR SYSTEM
 - BASE FEATURES**
 - LOCAL ROAD
 - WATERCOURSE



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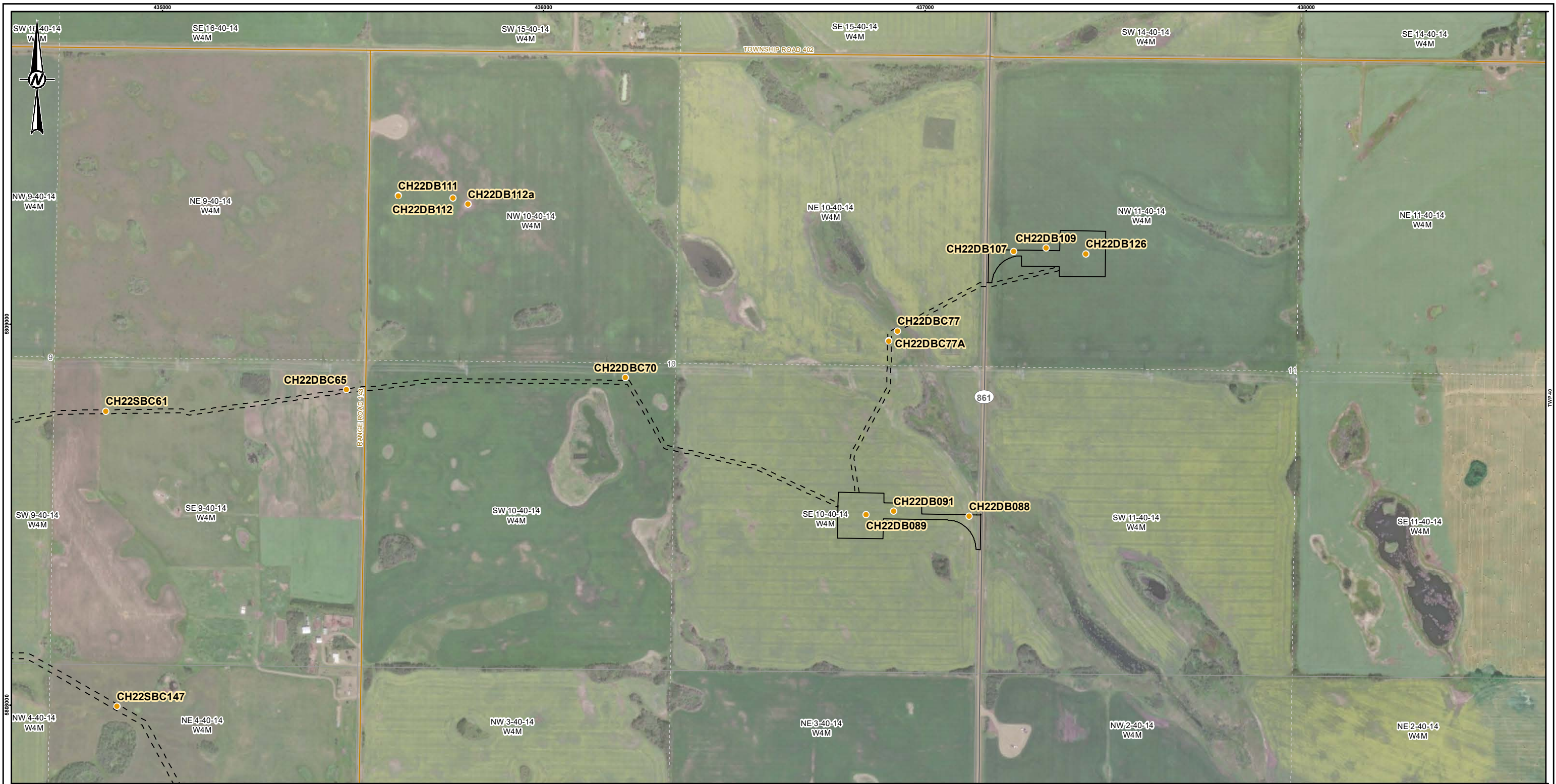
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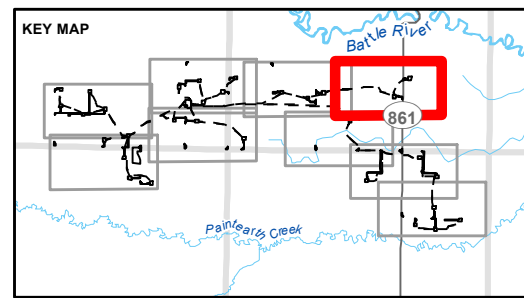
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- FOOTPRINT (WITHOUT CRANE PATH)
 - - - UNDERGROUND COLLECTOR SYSTEM
- BASE FEATURES**
- SECONDARY HIGHWAY
 - LOCAL ROAD



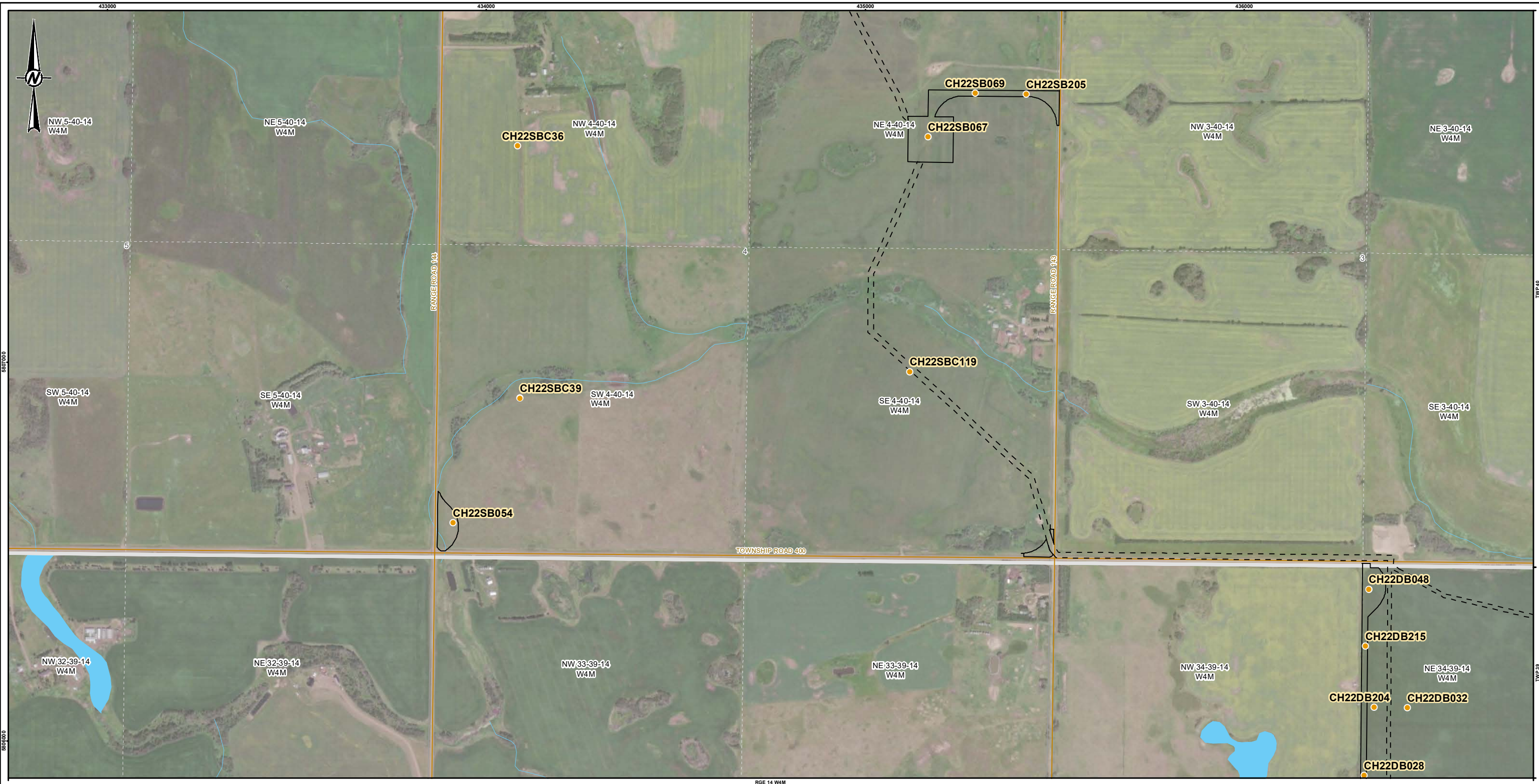
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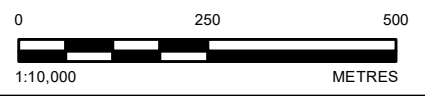
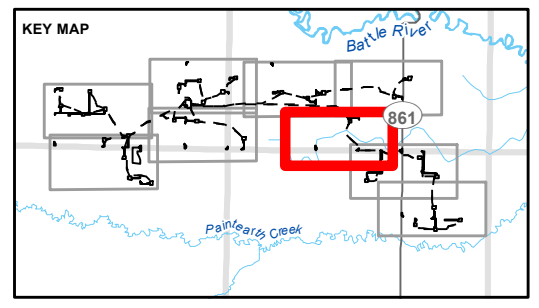
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- BASE FEATURES**
- LOCAL ROAD
 - WATERCOURSE
 - WATERBODY



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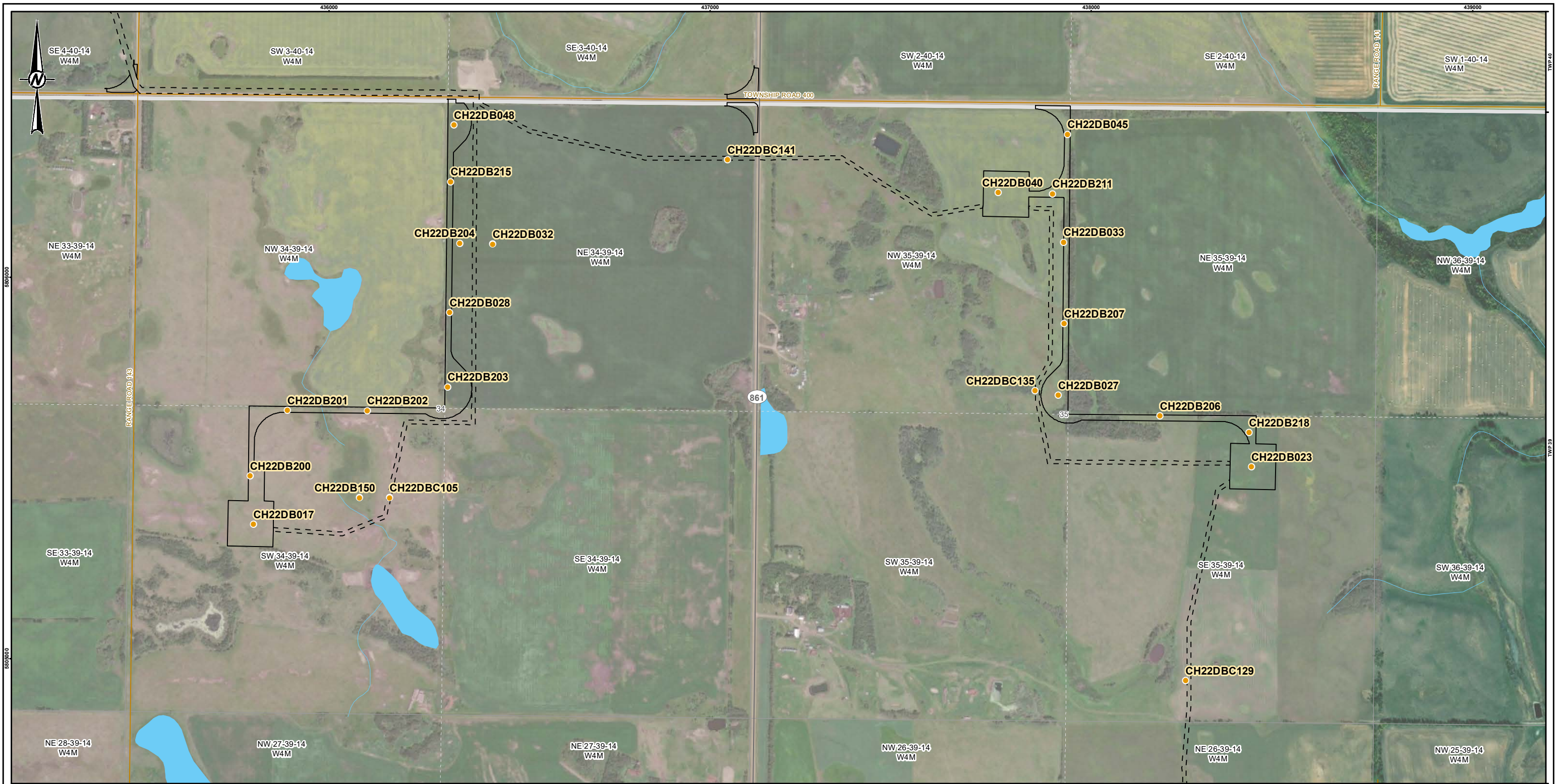
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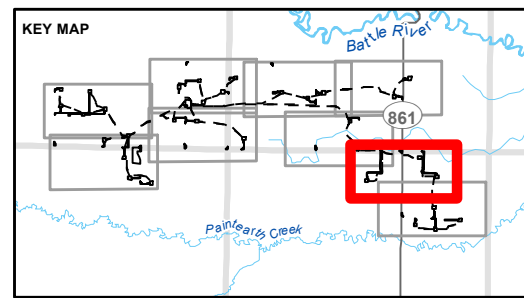
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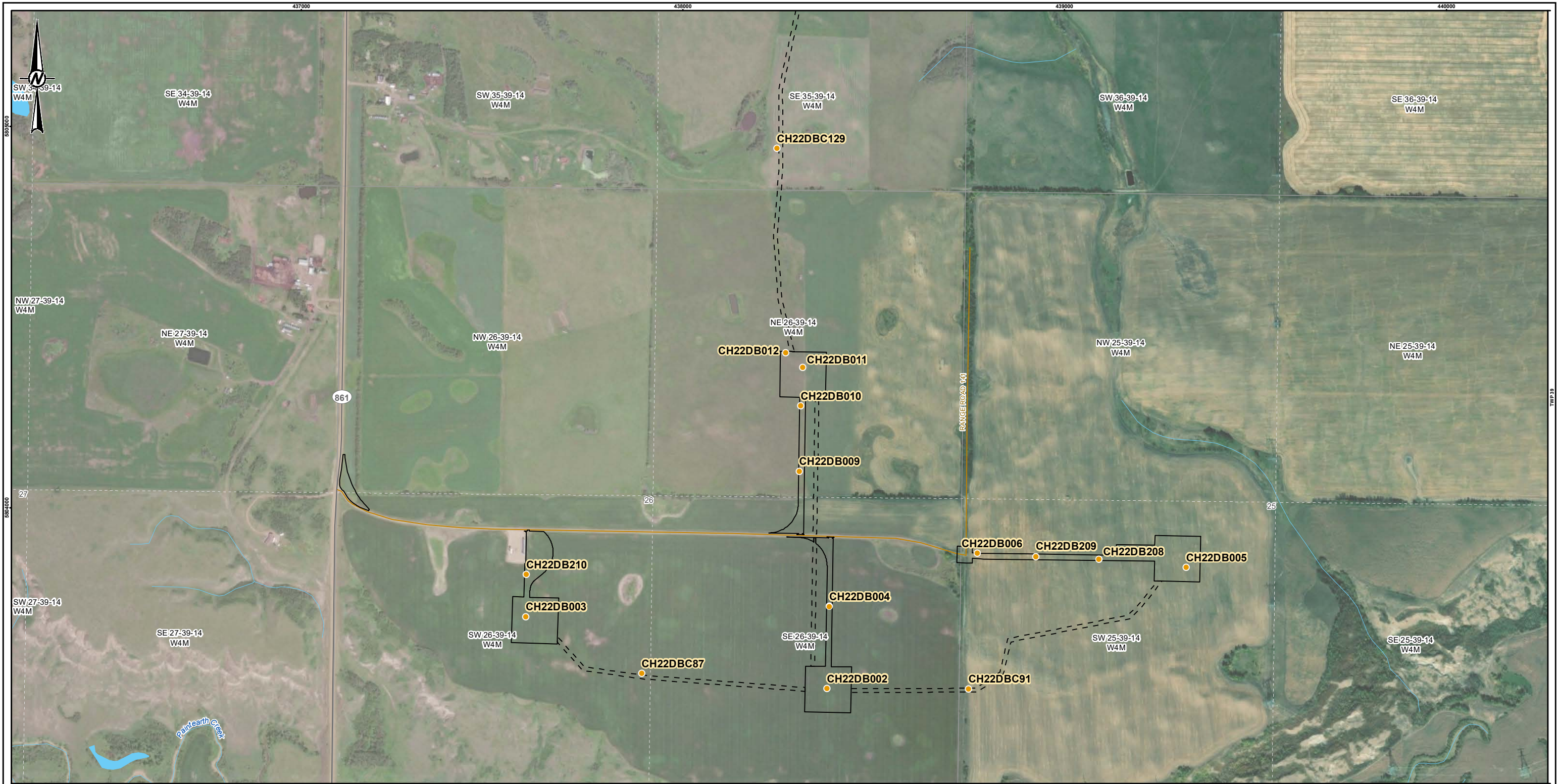
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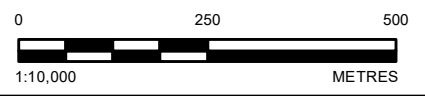
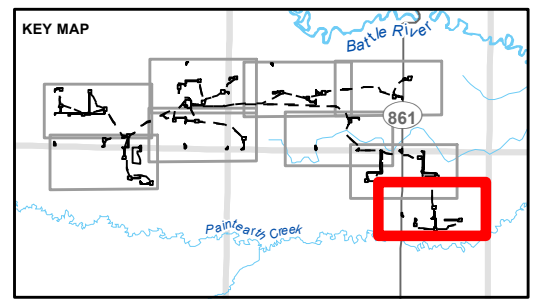
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1.1 Report Organization

The following section details the main sections outlining this SVMP:

- Section 1.0 includes information related to the overall Project location, the LOD, and regional setting.
- Section 2.0 includes soil and vegetation PDSA methods used to develop soil and vegetation management plans.
- Section 3.0 summarizes the results from the soil and vegetation PDSAs.
- Section 4.0 describes the soil management plan, including mitigations and best management practices (BMPs) for soil salvage, stockpiling, and soil replacement.
- Section 5.0 provides the vegetation management plan, including mitigations and BMPs for revegetation, weed management, and rare and listed plant management.
- Supplemental information is presented in the appendices as follows:
 - Appendix A: Pre-Disturbance Site Assessment and Soil and Vegetation Management Plan Methods
 - Appendix B: Project Operational Mapping
 - Appendix C: Soil Map Unit Descriptions
 - Appendix D: Soil Abbreviations Key
 - Appendix E: Soil and Terrain Field Inspection Data
 - Appendix F: Soil Laboratory Analysis Data
 - Appendix G: Vegetation Field Inspection Data and Species Inventory
 - Appendix H: Representative Soil and Landcover Field Photos
 - Appendix I: ACIMS Species and Communities Within the Central Parkland Natural Subregion
 - Appendix J: Wetland Photographs

1.2 Regional Setting

The Project is located within the Castor Plain Physiographic District (Pettapiece 1986), with surficial geology predominantly characterized by stagnant ice moraine (till) deposits (Shetsen 1987) with undulating topography formed from the collapse and slumping of englacial and supraglacial debris in response to the melting of buried stagnant ice near the glacial margin (Fenton et al. 2013). The till deposit is composed of an unsorted mixture of clay, silt, sand, and gravel with thicknesses generally less than 25 m in upland areas and up to 100 m in thickness at lower elevations (Shetsen 1987). Along the western edge and southeastern corner of the Project, draped moraines of discontinuous till overlying bedrock have been mapped by Shetsen (1987). These till deposits are characterized by flat to undulating topography and are generally less than 3 m in thickness (Shetsen 1987). Topography within the Project is typically level to gently undulating. The Battle River is located approximately 2 km north of the Project. Elevations range from approximately 725 meters above sea level (masl) in the east to approximately 760 masl in the west section of the LOD.

The Project is located within Soil Correlation Area 4 (SCA 4) (Alberta Soil Information Centre [ASIC] 2016). An SCA identifies areas of similar soil climate and landscape ecology within a specific geographic limit (ASIC 2016). Soils in SCA 4 are predominantly Dark Brown Chernozems and Solonchic soils, with Regosols located in steep valleys (Pedocan 1993). Reclamation issues that may arise with soils in SCA 4 can include the presence of salt-affected soils, thin and discontinuous topsoil, poor color change between topsoil and upper subsoil (A and B horizons), and moderate to high potential for soil erosion by wind, which may increase with vegetation clearing and soil disturbance (Pedocan 1993).

The Project is located within the Central Parkland Natural Subregion of the Parkland Natural Region (NRC 2006). Land uses within the Central Parkland Natural Subregion are dominantly cultivated with limited extents of native vegetation (approximately 5% by area) (NRC 2006). Native areas of the Central Parkland Natural Subregion are generally dominated by grasses such as plains rough fescue, slender wheat grass (*Agropyron trachycaulum*), western porcupine grass (*Hesperostipa curtisetata*), June grass (*Koeleria macrantha*), needle-and-thread grass (*Hesperostipa comata*), and blue grama grass (*Bouteloua gracilis*) (NRC 2006). Shrub communities typically only occur in moderately well drained sites in moister locations near wetlands and waterbodies (NRC 2006). Shrub communities in these areas typically consist of buckbrush (*Symphoricarpos occidentalis*), silverberry (*Elaeagnus commutate*), prickly rose (*Rosa acicularis*), chokecherry (*Prunus virginiana*), and saskatoon (*Amelanchier alnifolia*) (NRC 2006). Aspen dominated forests vary based on parent material and moisture, and in the southeast part of the subregion, aspen forests are restricted to imperfectly drained depressions. However, as precipitation increases to the north and west of the subregion, aspen forests become the dominant native vegetation (NRC 2006).

A complete summary of the baseline environmental conditions is presented in the Environmental Evaluation (WSP Golder 2022).

2.0 METHODS

Detailed soil and vegetation PDSA methods and information used to develop the soil and vegetation management recommendations are presented in Appendix A.

3.0 PRE-DISTURBANCE SITE ASSESSMENT RESULTS

3.1 Soil and Terrain

3.1.1 Pre-Disturbance Conditions

Soils in the LOD are dominantly comprised of moderately well to well-drained Orthic Dark Brown Chernozems and Dark Brown Solodized Solonchics, developed on medium to moderately fine textured till deposits. Terrain within the LOD has low variability, with undulating, low relief topography. Extents and characteristics of each soil map unit (SMU) within the LOD are summarized in Table 1, and are visually represented in Appendix B, along with detailed information for each SMU provided in Appendix C and Appendix D. Field inspection data for soil and terrain can be found in Appendix E, while soil chemical data can be found Appendix F.

Table 1: Summary of Soil Map Units within the LOD

Soil Map Unit (a),(f)	Soil Series Name	Dominant Soil Subgroup(s) ^(e)	Area within LOD	Proportion of LOD	Topsoil Texture (b),(c)	Upper Subsoil Texture ^{(b),(e)}	Soil Drainage	Surface Expression	Average Slope
			ha	%					%
BFD	<i>Brownfield</i>	DB.SO	11.3	7.6	L	CL, SCL	W	U1l	2 to 5
FMN	<i>Foreman</i>	HU.LG	0.8	0.5	L	CL, L	P	U1l	0 to 5
FST	<i>Flagstaff</i>	SZ.DBC	12	8.1	L	CL, SCL	W	U1l	0 to 5
HKR	<i>Halkirk</i>	DB.SS	10.4	7	L	CL, SCL	W	U1l	0 to 5
HND	<i>Hughenden</i>	O.DBC	49.8	33.7	L	SCL, L	W to MW	U1l	0 to 5
HNDca	<i>Hughenden – calcareous</i>	CA.DBC	0.2	0.1	SL, L	SCL, L	W	U1l	0 to 5
HNDco	<i>Hughenden – coarse</i>	O.DBC	1.4	0.9	L	SL, L	W	U1l	0 to 5
HNDgl	<i>Hughenden – gleyed</i>	GL.DBC	5.5	3.7	L	CL, L	MW to I	U1l	0 to 5
LFE	<i>Lanfine</i>	GLE.DBC	1.1	0.7	SiL, L	CL, L	I	U1l	0 to 5
OVE	<i>Onnevue</i>	SZ.DBC	25.7	17.4	L	SCL, CL	W	U1l	0 to 5
OVEgl	<i>Onnevue – gleyed</i>	GLSZ.DBC	0.2	0.1	L	C	I	U1l	0 to 5
SHR	<i>Sheerness</i>	DB.SZ	22	14.9	L	CL	W	U1l	0 to 5
SHRgl	<i>Sheerness – gleyed</i>	GLDB.SZ	0.1	0.1	L	CL	MW	U1l	0 to 5
ZDL	<i>Misc. disturbed land</i>	N/A	4.1	2.8	-	-	-	-	-
ZGL	<i>Misc. Gleysol</i>	N/A	3.4	2.3	n/d	n/d	n/d	n/d	n/d
Total ^(d)			147.9	100.0					

(a) all soil series within the LOD are developed on till. ZDL and ZGL may occur on other parent materials, as they are misc. subgroups

(b) Inclusions of other textures may be present within each soil map unit.

(c) Topsoil includes A horizon(s). Upper subsoil includes AB and B horizon(s) (if present).

(d) Values may not add due to rounding.

(e) Abbreviations are defined in Appendix C.

(f) For display purposes, only SMUs with recommended stripping prior to collector line installation (i.e., salt-affected SMUs) are shown in Appendix B.

“-“ = not applicable; n/d = not determined All values should be considered approximate.

3.1.2 Existing Disturbances

Existing soil disturbances within the LOD include gravel roads, ditches, and existing utilities (i.e., transmission lines) and occupy approximately 4.3% of the LOD (Table 2; Figure 3). Existing disturbances are not mapped from PDSA results, as they can include areas that have been reclaimed or are currently operational, so values may differ from the ZDL SMU. As only disturbed areas are shown in Table 2, the totals presented do not add to 100%, or the entire 147.9 ha of the LOD.

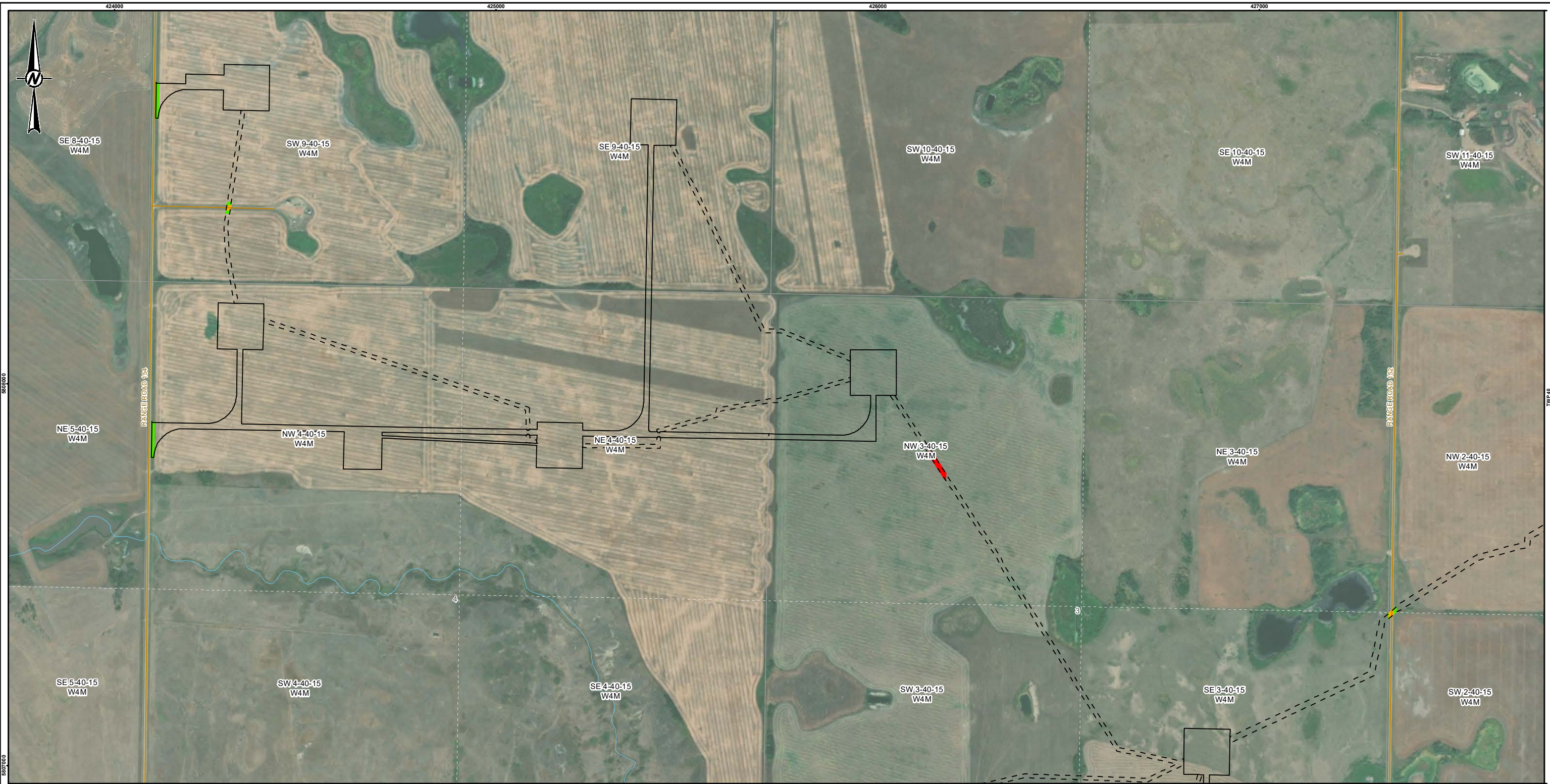
Table 2: Existing Disturbances within the LOD

Existing Disturbance and Modified Landcover Type ^(a)	Area Within LOD ^(b)	
	ha	% of LOD
Pipeline Right-of Way	<0.1	<0.1
Gravel Road	1.1	0.7
Unimproved Road	0.1	0.1
Rural Residence	0.1	0.1
Transmission Line	0.1	0.1
Road Edges (Vegetated)	4.7	3.2
Abandoned Wellsites	0.3	0.2
Wellsites	<0.1	<0.1
Total^(c)	6.4	4.3

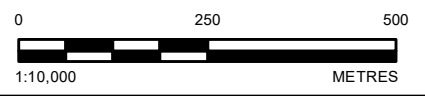
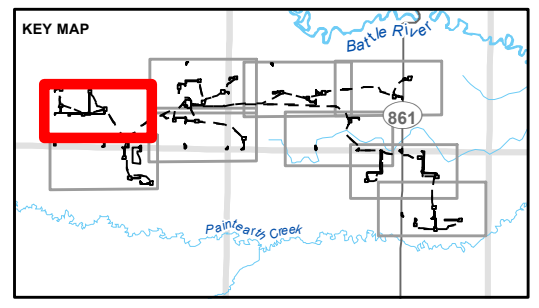
(a) Source: ABMI (2018).

(b) Values are considered approximate.

(c) Values may not add due to rounding.



- LEGEND**
- FOOTPRINT BOUNDARY**
- FOOTPRINT (WITHOUT CRANE PATH)
 - UNDERGROUND COLLECTOR SYSTEM
- BASE FEATURES**
- LOCAL ROAD
 - WATERCOURSE
- EXISTING DISTURBANCES**
- ROAD-GRAVEL-1L
 - VEGETATED-EDGE-ROADS
 - WELL-ABANDONDED



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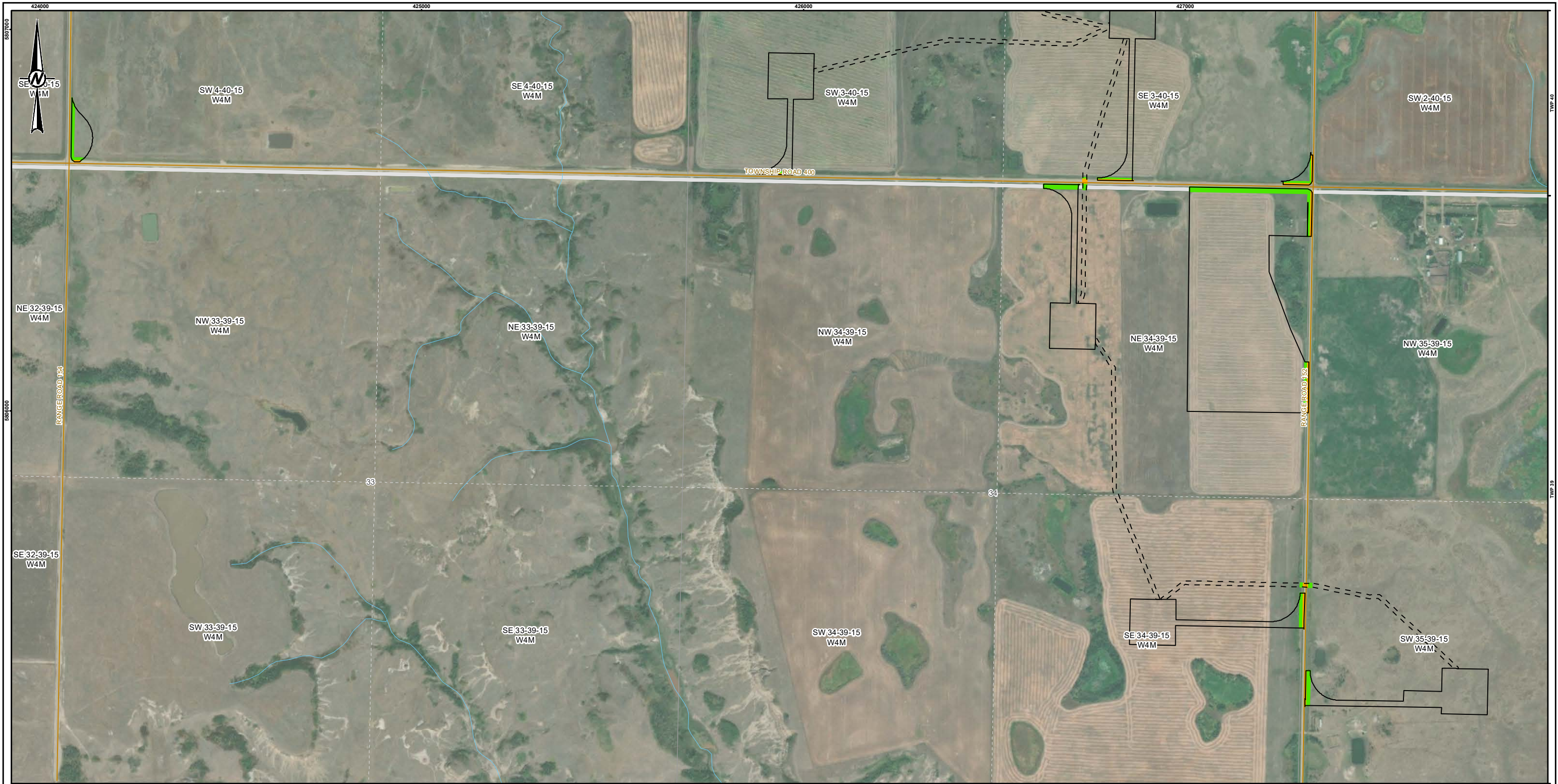
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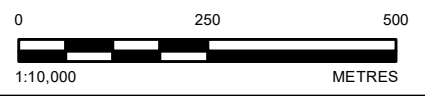
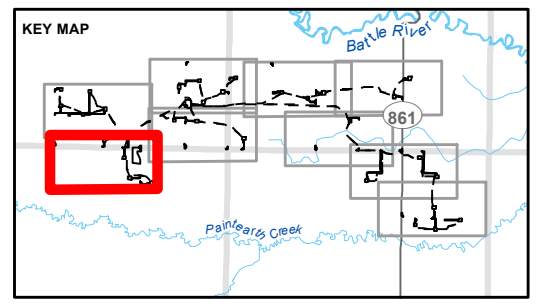
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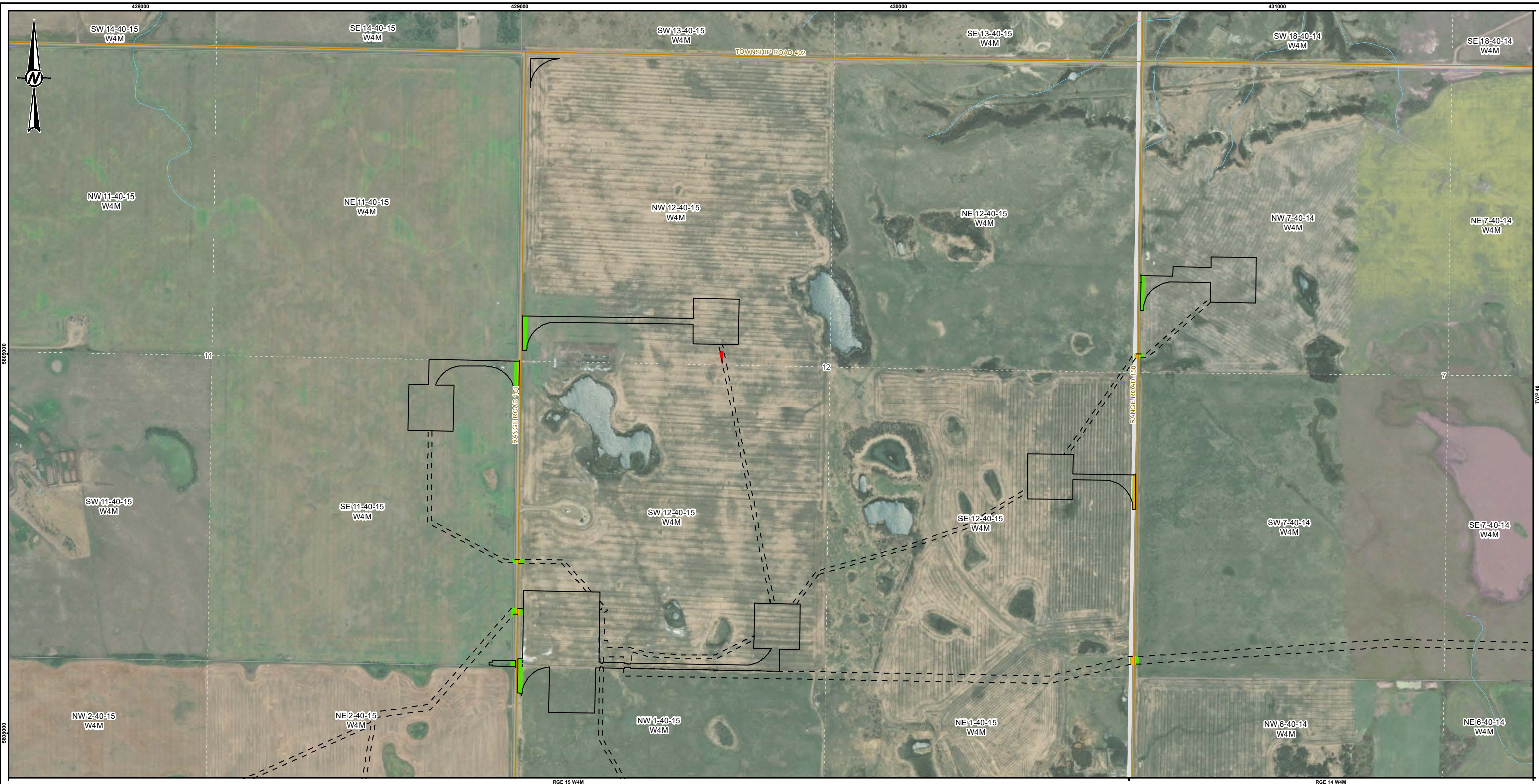
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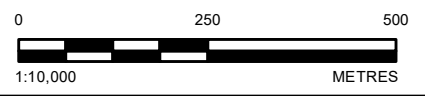
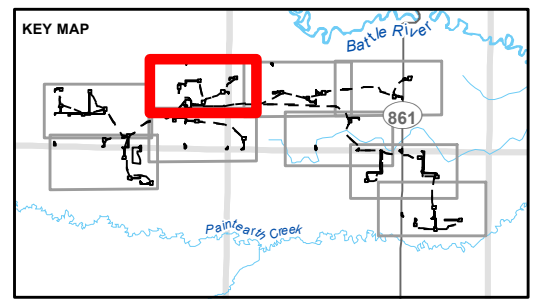
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 EXISTING DISTURBANCES OBTAINED FROM ABMI HUMAN FOOTPRINT DATA. THIS DATASET INCLUDES DATA COLLECTED FROM PROPRIETARY SOURCES, OPEN SOURCES AND THE ABMI. ALBERTA DIGITAL BASE DATA MAY BE OBTAINED FROM GEOGRATIS, © DEPARTMENT OF NATURAL RESOURCES CANADA. ALL RIGHTS RESERVED, ALTALIS LTD. © GOVERNMENT OF ALBERTA 2023. ALL RIGHTS RESERVED. IMAGERY COPYRIGHT ©20180117 ESRI AND ITS LICENSORS. SOURCE: PAINTHEARTH COUNTY NO. 18. USED UNDER LICENSE, ALL RIGHTS RESERVED.
 PROJECTION: UTM ZONE 12 DATUM: NAD 83

PROJECT
HALKIRK 2 WIND POWER PROJECT

TITLE
EXISTING DISTURBANCES AND MODIFIED LANDCOVER TYPES WITHIN THE PROJECT FOOTPRINT

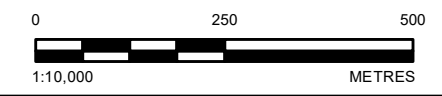
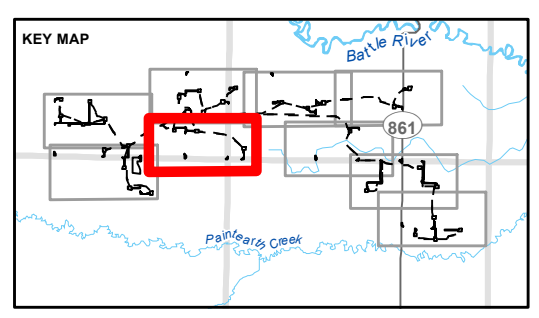
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IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B



- LEGEND**
- FOOTPRINT BOUNDARY**
- FOOTPRINT (WITHOUT CRANE PATH)
 - UNDERGROUND COLLECTOR SYSTEM
- BASE FEATURES**
- LOCAL ROAD
 - WATERCOURSE
- EXISTING DISTURBANCES**
- PIPELINE
 - ROAD-GRAVEL-1L
 - ROAD-UNIMPROVED
 - VEGETATED-EDGE-ROADS



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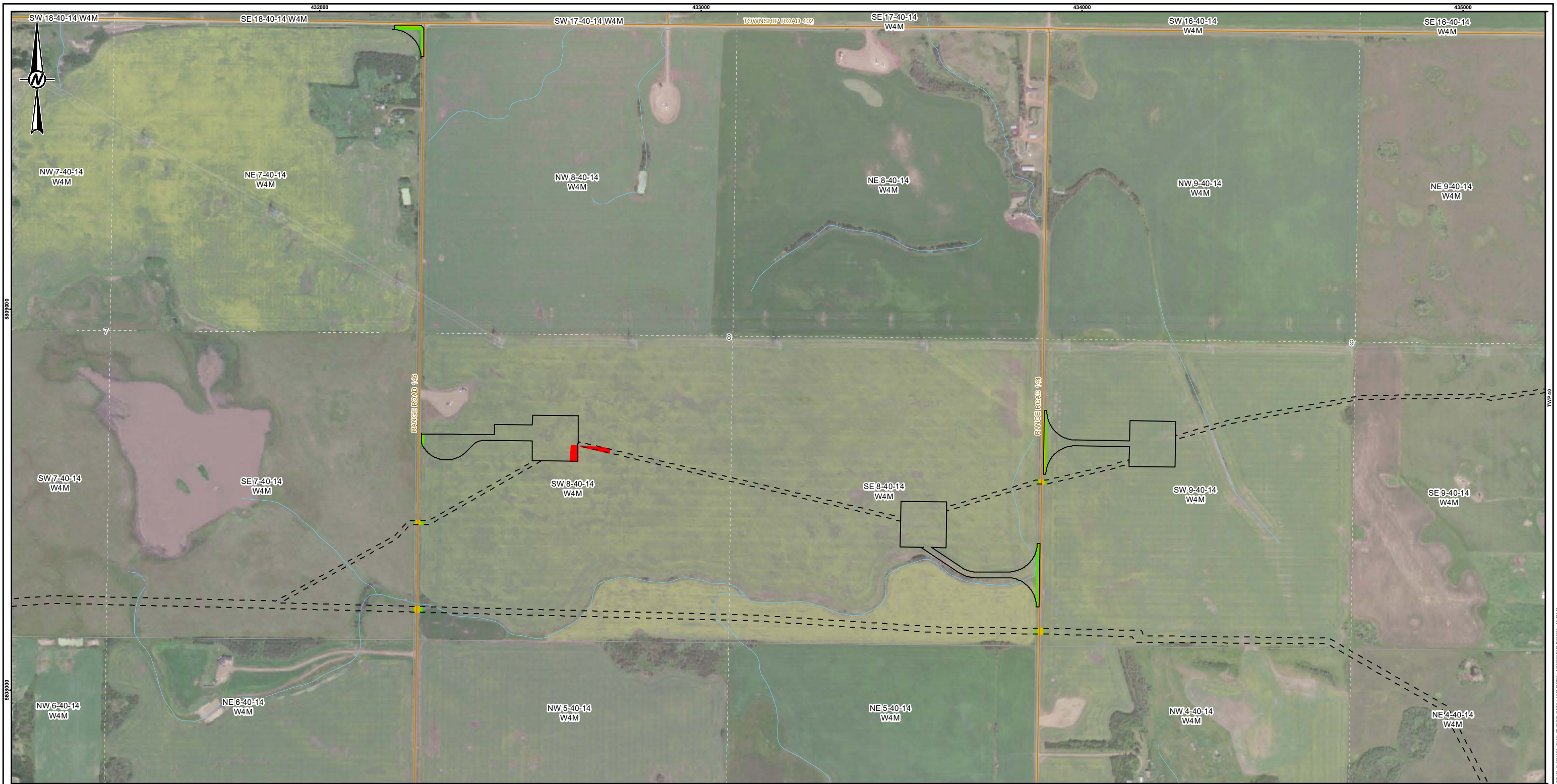
PROJECT
HALKIRK 2 WIND POWER PROJECT

TITLE
EXISTING DISTURBANCES AND MODIFIED LANDCOVER TYPES WITHIN THE PROJECT FOOTPRINT

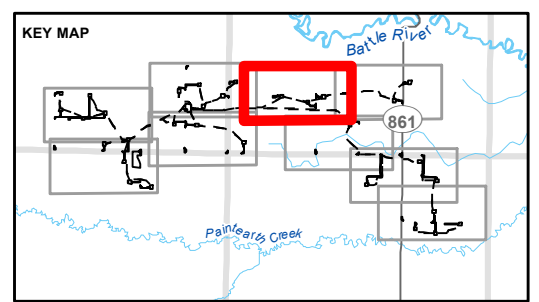
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- LEGEND**
- FOOTPRINT BOUNDARY**
- FOOTPRINT (WITHOUT CRANE PATH)
 - - - UNDERGROUND COLLECTOR SYSTEM
- BASE FEATURES**
- LOCAL ROAD
 - WATERCOURSE
- EXISTING DISTURBANCES**
- ROAD-GRAVEL-1L
 - RURAL-RESIDENCE
 - VEGETATED-EDGE-ROADS
 - WELL-ABANDONED



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PREPARED	LB
REVIEWED	LS
APPROVED	SC

REFERENCE(S)
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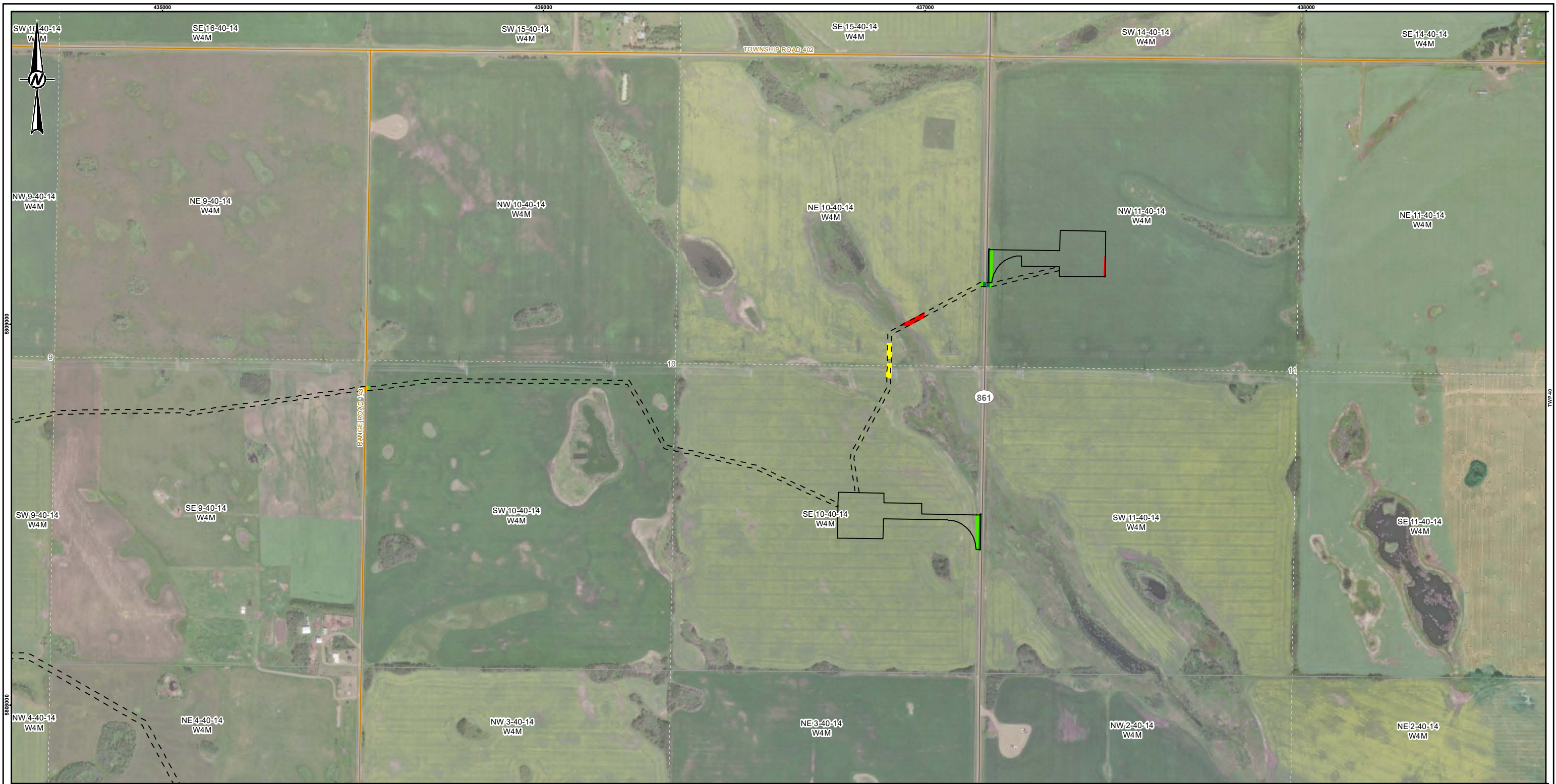
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HALKIRK 2 WIND POWER PROJECT

TITLE
EXISTING DISTURBANCES AND MODIFIED LANDCOVER TYPES WITHIN THE PROJECT FOOTPRINT

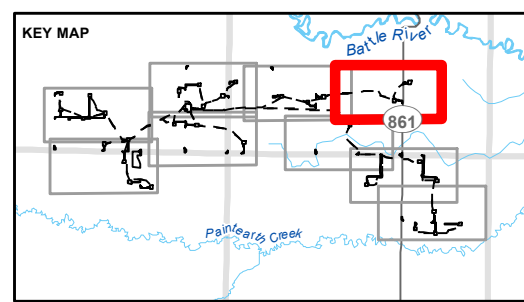
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- LEGEND**
- FOOTPRINT BOUNDARY**
- FOOTPRINT (WITHOUT CRANE PATH)
 - - - UNDERGROUND COLLECTOR SYSTEM
- BASE FEATURES**
- SECONDARY HIGHWAY
 - LOCAL ROAD
- EXISTING DISTURBANCES**
- ROAD-GRAVEL-1L
 - ROAD-GRAVEL-2L
 - TRANSMISSION-LINE
 - VEGETATED-EDGE-ROADS
 - WELL-ABANDONED



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wsp

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REVIEWED	LS
APPROVED	SC

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PROJECT
HALKIRK 2 WIND POWER PROJECT

TITLE
EXISTING DISTURBANCES AND MODIFIED LANDCOVER TYPES WITHIN THE PROJECT FOOTPRINT

PROJECT NO.	CONTROL	REV.	FIGURE
21451763		0	3-F

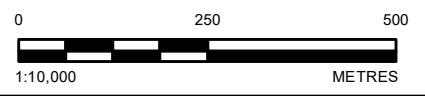
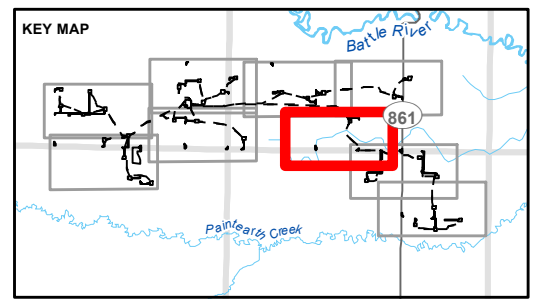
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- LEGEND**
- FOOTPRINT BOUNDARY**
- FOOTPRINT (WITHOUT CRANE PATH)
 - - - UNDERGROUND COLLECTOR SYSTEM
- BASE FEATURES**
- LOCAL ROAD
 - WATERCOURSE
 - WATERBODY

- EXISTING DISTURBANCES**
- ROAD-GRAVEL-1L
 - RURAL-RESIDENCE
 - VEGETATED-EDGE-ROADS
 - WELL-GAS



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APPROVED	SC

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PROJECT

HALKIRK 2 WIND POWER PROJECT

TITLE

EXISTING DISTURBANCES AND MODIFIED LANDCOVER TYPES WITHIN THE PROJECT FOOTPRINT

PROJECT NO.	CONTROL	REV.	FIGURE
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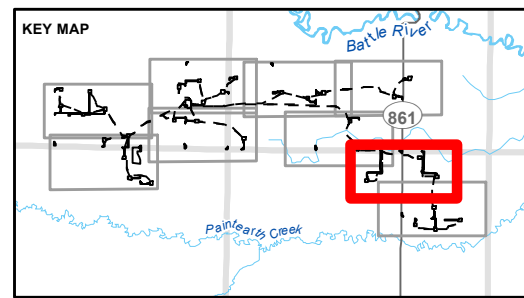
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- LEGEND**
- FOOTPRINT BOUNDARY**
- FOOTPRINT (WITHOUT CRANE PATH)
 - - - UNDERGROUND COLLECTOR SYSTEM
- BASE FEATURES**
- SECONDARY HIGHWAY
 - LOCAL ROAD
 - WATERCOURSE
 - WATERBODY

- EXISTING DISTURBANCES**
- ROAD-GRAVEL-1L
 - ROAD-GRAVEL-2L
 - RURAL-RESIDENCE
 - VEGETATED-EDGE-ROADS
 - WELL-GAS



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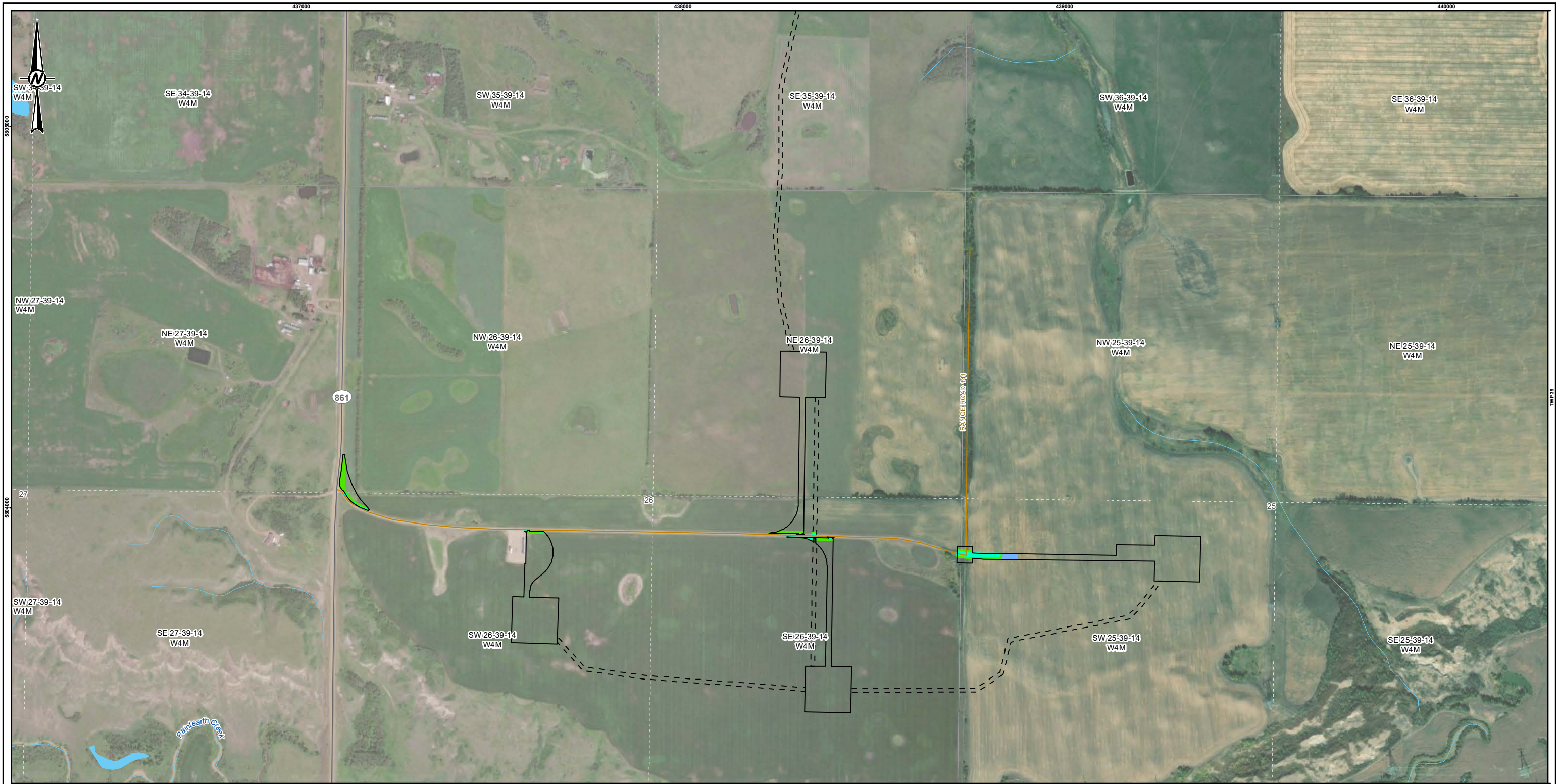
PROJECT
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TITLE
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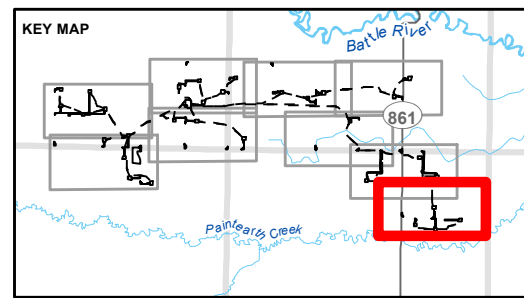
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IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B



- LEGEND**
- FOOTPRINT BOUNDARY**
- FOOTPRINT (WITHOUT CRANE PATH)
 - - - UNDERGROUND COLLECTOR SYSTEM
- BASE FEATURES**
- SECONDARY HIGHWAY
 - LOCAL ROAD
 - WATERCOURSE
 - WATERBODY
- EXISTING DISTURBANCES**
- ROAD-UNIMPROVED
 - RURAL-RESIDENCE
 - VEGETATED-EDGE-ROADS



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PROJECT
HALKIRK 2 WIND POWER PROJECT

TITLE
EXISTING DISTURBANCES AND MODIFIED LANDCOVER TYPES WITHIN THE PROJECT FOOTPRINT

PROJECT NO.	CONTROL	REV.	FIGURE
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3.1.3 Potential Soil Handling Constraints

Reclamation suitability, water and wind erosion risk, and compaction risk were assessed for each SMU; ratings are summarized in Table 3.

Approximately 46.7% of the LOD has “Good” rated topsoil, 7.5% has “Fair” rated topsoil, 29.8% has “Poor” rated topsoil, and 6.8% has “Unsuitable” topsoil. “Unsuitable” and “Poor” rated soils within the LOD are chemically restricted (pH and SAR). “Good” subsoil accounts for less than 1% of the LOD. Subsoil within the LOD is rated “Fair” (37.8% of the LOD), “Unsuitable” (45.2%) and “Poor” (6.9%). Unsuitable subsoil ratings result from high sodicity (SAR) values measured from laboratory samples.

Approximately 85.6% of the LOD has low compaction risk for topsoil horizons, underlain by subsoil horizons with moderate compaction risk. An additional 4.5% of the LOD has moderate risk of topsoil compaction, while 0.5% of the LOD has high risk, with the remainder associated with miscellaneous Gleysols and previously disturbed land. Approximately 5.1% of the LOD has high subsoil compaction risk; these areas are associated with the HNDgl, LFE, FMN, and OVEgl SMU, and were not captured in the portion of the LOD which has low compaction risks for topsoil horizons. Compaction risk ratings assume dry to moist, unsaturated, and non-frozen field conditions. Compaction risk is highly dependent on soil water content, thus, the SMUs within the LOD will be more prone to compaction under wet conditions associated with precipitation events or freshet. Finally, wind and water erosion risks for the LOD were generally rated as moderate for both topsoil and subsoil horizons.

Table 3: Reclamation Suitability and Soil Handling Constraints Summary

SMU	Subgroup	Soil Drainage	Reclamation Suitability	Reclamation Suitability	Compaction Risk	Compaction Risk	Water Erosion Risk	Water Erosion Risk	Wind Erosion Risk	Wind Erosion Risk
			Topsoil	Upper Subsoil	Topsoil	Upper Subsoil	Topsoil	Upper Subsoil	Topsoil	Upper Subsoil
BFD	DB.SO	W	Fair	Unsuitable (SAR)	Low	Moderate	Moderate	Moderate	Moderate	Moderate
FMN	HU.LG	P	Good*	Fair*	High	High	Moderate	Moderate	Moderate	Moderate
FST	SZ.DBC	W	Good*	Unsuitable (SAR)***	Low	Moderate	Moderate	Moderate	Moderate	Moderate
HKR	DB.SS	W	Unsuitable (pH)	Poor (pH)	Low	Moderate	Moderate	Moderate	Moderate	Moderate
HND	O.DBC	W to MW	Good*	Fair*	Low	Moderate	Moderate	Moderate	Moderate	Moderate
HNDca	CA.DBC	W	Good*	Fair*	Low	Moderate	Moderate	Moderate	Moderate	Moderate
HNDco	O.DBC	W	Good*	Good*	Low	Moderate	Moderate	Moderate	Moderate	Moderate
HNDgl	GL.DBC	MW to I	Good*	Fair*	Moderate	High	Moderate	Moderate	Moderate	Moderate
LFE	GLE.DBC	I	Good*	Fair*	Moderate	High	High	Moderate	Moderate	Moderate
OVE	SZ.DBC	W	Poor (SAR, pH)	Unsuitable (SAR)	Low	Moderate	Moderate	Moderate	Moderate	Moderate
OVEgl	GLSZ.DBC	I	Good*	Poor*	Moderate	High	Moderate	Low	Moderate	Low
SHR	DB.SZ	W	Poor (SAR, pH)	Unsuitable (SAR)	Low	Moderate	Moderate	Moderate	Moderate	Moderate
SHRgl	GLDB.SZ	MW	Good*	Fair*	Low	Moderate	Moderate	Moderate	Moderate	Moderate
ZDL	N/A	-	N/A**	N/A**	N/A**	N/A**	N/A**	N/A**	N/A**	N/A**
ZGL	N/A	-	Good	Fair	High	High	Moderate	Moderate	Moderate	Moderate

Methods for assigning ratings may be found in Appendix A.

N/A= Not applicable.

* determined based only on texture, as not all soils within the footprint were sampled

** Not rated, as these are miscellaneous groups, and their parent materials, textures, and chemical parameters can vary greatly.

*** Rating assigned based on sites with similar field conditions

3.2 Vegetation and Wetlands

Landcover within the LOD is dominantly cultivated, hayland, or tame pasture, with limited extents of developed lands and waterbodies or wetlands, summarized in Table 4. Landcover data are presented by two footprint categories in the LOD consisting of:

1. Construction Footprint, and
2. Underground Collector System.

Table 4: Landcover Types within the Project's Limit of Disturbance (LOD)

Landcover Type	Limit of Disturbance (LOD)	
	Area (ha)	Percent of Total LOD (%)
Construction Footprint		
Cultivated	75.1	50.8
Modified grassland	1.9	1.3
Modified pasture	3.4	2.3
Road/trail	0.6	0.4
Tame pasture or hay	20.3	13.7
Wetlands and waterbodies	1.7	1.1
Aspen or mixed forest	0.4	0.3
Subtotal	103.3	69.9
Underground Collector System		
Cultivated	29.2	19.7
Developed	<0.1	<0.1
Farmyard	<0.1	<0.1
Modified grassland	6.1	4.1
Modified pasture	1.2	0.8
Road/Trail	0.5	0.3
Tame pasture or hay	6.7	4.5
Wetlands and waterbodies	0.9	0.6
Aspen or mixed forest	0.1	0.1
Subtotal	44.6	30.2
TOTAL	147.6	100

Note: Some numbers are rounded for presentation purposes; therefore, totals may not equal the sum of the individual values.

(a) Developed consists of bare stripped areas with buildings that could be residential or industrial.

(b) Wetlands and waterbodies include graminoid marshes, swamps, ephemeral waterbodies, and natural drainages. Refer to Table 5 for a detailed breakdown.

ha = hectare; % = percent

The LOD has mostly been disturbed through cultivation, grazing/haying, or mowing with cultivated being the dominant land cover type. The cultivated land cover type occupies 104.3 ha of the total 147.9 ha in the LOD. Native land cover types including wetlands and waterbodies, and aspen/ mixed forest occupy the least area of the LOD at 2.5 ha and 0.5 ha. In addition, the LOD does not intersect with any native grasslands.

The cultivated landcover type typically consisted of crops including, wheat (*Triticum aestivum*), oat (*Avena fatua*), canola (*Brassica napus*) and barley (*Hordeum vulgare*) with traces of smooth brome (*Bromus inermis*), perennial sow-thistle (*Sonchus arvensis*), and creeping thistle (*Cirsium arvense*). Modified grassland consisted of Kentucky bluegrass (*Poa pratensis*), smooth brome, foxtail barley (*Hordeum jubatum*), and creeping thistle. Modified pasture was dominated by alfalfa (*Medicago sativa*), and smooth brome. Tame pasture or hay consisted of alfalfa and Kentucky bluegrass. The aspen or mixed forest landcover type was dominated by aspen trees with an understory of smooth brome and elegant goldenrod (*Solidago lepida*).

Wetlands were dominated by foxtail barley, cultivated barley, fowl blue grass (*Poa palustris*), Kentucky bluegrass, reed canary grass (*Phalaris arundinacea*), smooth brome, barnyard grass (*Echinochloa crusgalli*), common cattail (*Typha latifolia*), pale persicaria (*Persicaria lapathifolia*), broad-leaved water plantain (*Alisma triviale*), and needle spike rush (*Eleocharis acicularis*). Ephemeral waterbodies and drainages were dominated by cultivated crops, foxtail barley, barnyard grass, and timothy (*Phleum pratense*).

A complete list of dominant vegetation species in the LOD (a cover of greater than 5%) is presented in Appendix G. Representative photographs of landcover types in the LOD is presented in Appendix H. Landcover mapping, wetland locations, rare plant species and weeds within the LOD are displayed on Figure 4.

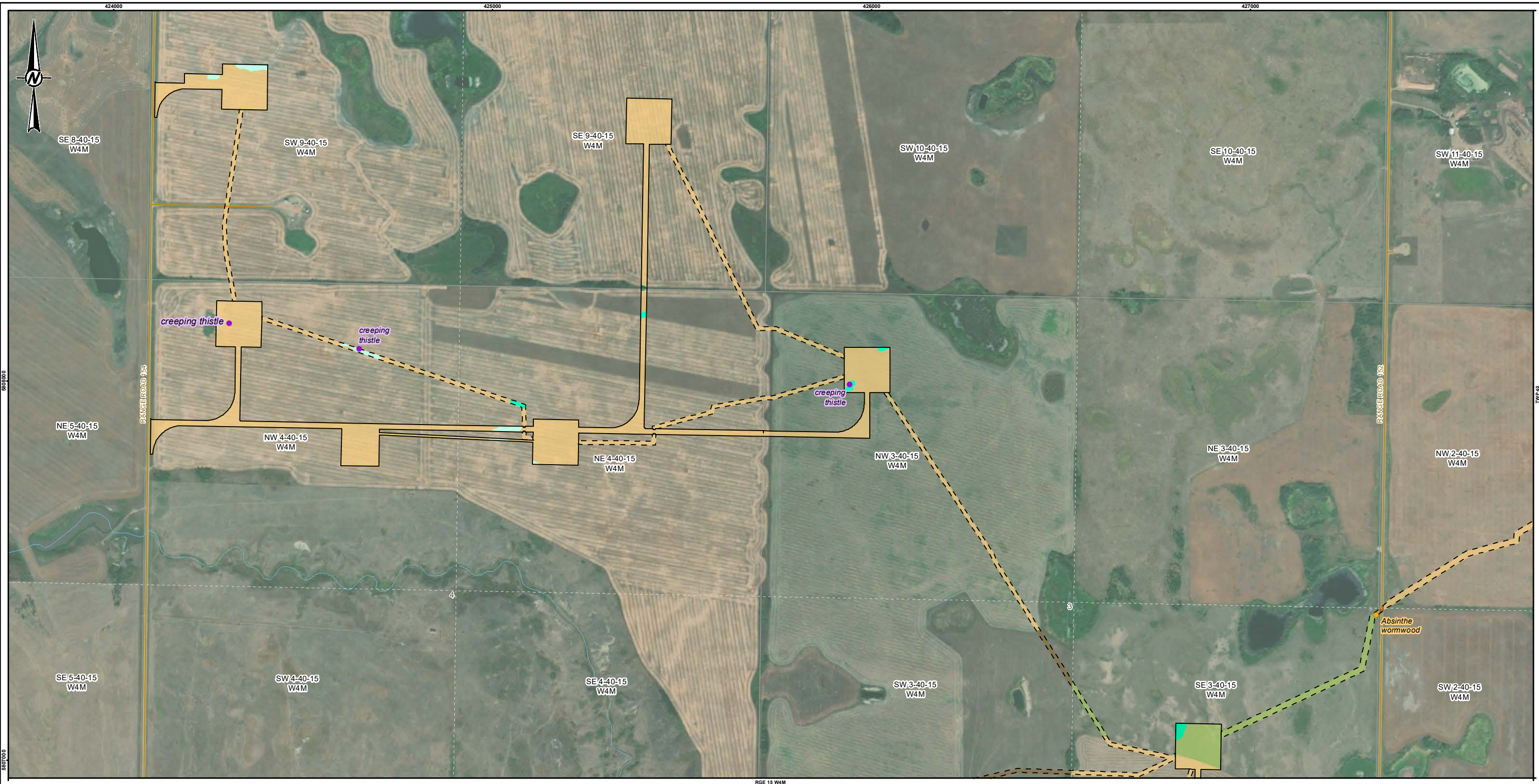
A review of public ecological data sets (Alberta Conservation Information Management System [ACIMS], Fish and Wildlife Management Information System [FWMIS], Primary Land and Vegetation Inventory [PLVI], Alberta Merged Wetland Inventory [AMWI], Environmentally Significant Areas Report and others) along with field surveys indicated no presence of any environmentally significant areas (ESAs), rare plant species and ecological communities (Fiera 2014; AEP 2018b; ACIMS 2022; AEP 2022). Typical Species and Communities Within the Central Parkland Natural Subregion are available in Appendix I.

Rare plant species and rare ecological communities are defined as species or ecological communities that are on track or watch lists maintained by ACIMS (ACIMS 2022). The ACIMS database contains 165 records historical occurrences of tracked or watched plant species and ecological communities in the Central Parkland Subregion; however, no rare plant or ecological communities was historically recorded in the desktop query or found during field assessments in the LOD (ACIMS 2022). The closest record of a rare plant species to the LOD was approximately 800 m away and identified as clammy hedge-hyssop (*Gratiola neglecta*) in 14-39-14-W4M with a provincial ranking of S3. A conservation status rank of S3 is defined as, “known from 100 or fewer occurrences, or somewhat vulnerable due to other factors, such as restricted range, relatively small population sizes or other factors” (ACIMS 2018).

3.2.1 Wetlands and Water bodies

In total, 50 wetlands and water bodies were documented within the LOD. During wetland field surveys, 47 of the 50 wetlands and waterbodies (approximately 94%) were field verified in the LOD. These wetlands and waterbodies included, temporary, seasonal, and semi-permanent graminoid marshes, temporary and seasonal shrubby swamps, ephemeral waterbody, and natural drainages. Wetlands permanently impacted by the Project footprint were submitted for regulatory approval in a Wetland Assessment and Impact Report (WAIR) on March 3, 2022. Alberta *Water Act* (GOA 2000) approvals will be prepared for ephemeral waterbody crossings and temporary wetland impacts through the Wetland Assessment and Impact Form (WAIF) approval process. *Water Act* approval for wetland and waterbody disturbance will be obtained prior to the start of construction and will outline conditions for disturbance within these areas.

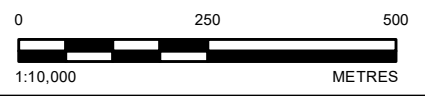
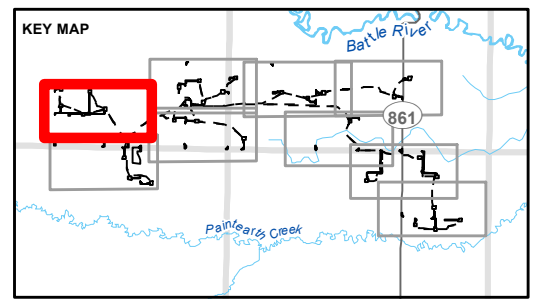
In the LOD, wetlands and waterbodies constitute 2.5 ha (1.7%) (Table 5). Additionally, all waterbodies within the construction footprint will be impacted during grading activities during Project construction. The areas of wetlands and water bodies within the LOD and construction footprint are summarized in Table 5. Locations of wetlands and waterbodies within the LOD and construction footprint are displayed on Figure 4. Representative photographs of each type of wetland and water body observed during wetland field verification surveys are provided in Appendix J.



- LEGEND**
- NOXIOUS WEED SPECIES OBSERVATION
 - WEED OF CONCERN BY THE COUNTY OF PAINTEARTH
- FOOTPRINT BOUNDARY**
- FOOTPRINT (WITHOUT CRANE PATH)
 - UNDERGROUND COLLECTOR SYSTEM
- BASE FEATURES**
- LOCAL ROAD
 - WATERCOURSE

- LAND COVER**
- ASPEN OR MIXED FOREST
 - CULTIVATED
 - MODIFIED GRASSLAND
 - ROAD
 - TAME PASTURE OR HAY

- WETLAND AND WATERBODY PERMANENCE**
- EPHEMERAL WATERBODY
 - TEMPORARY GRAMINOID MARSH
 - SEASONAL GRAMINOID MARSH



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wsp

YYYY-MM-DD	2023-09-15
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PREPARED	LB
REVIEWED	LS
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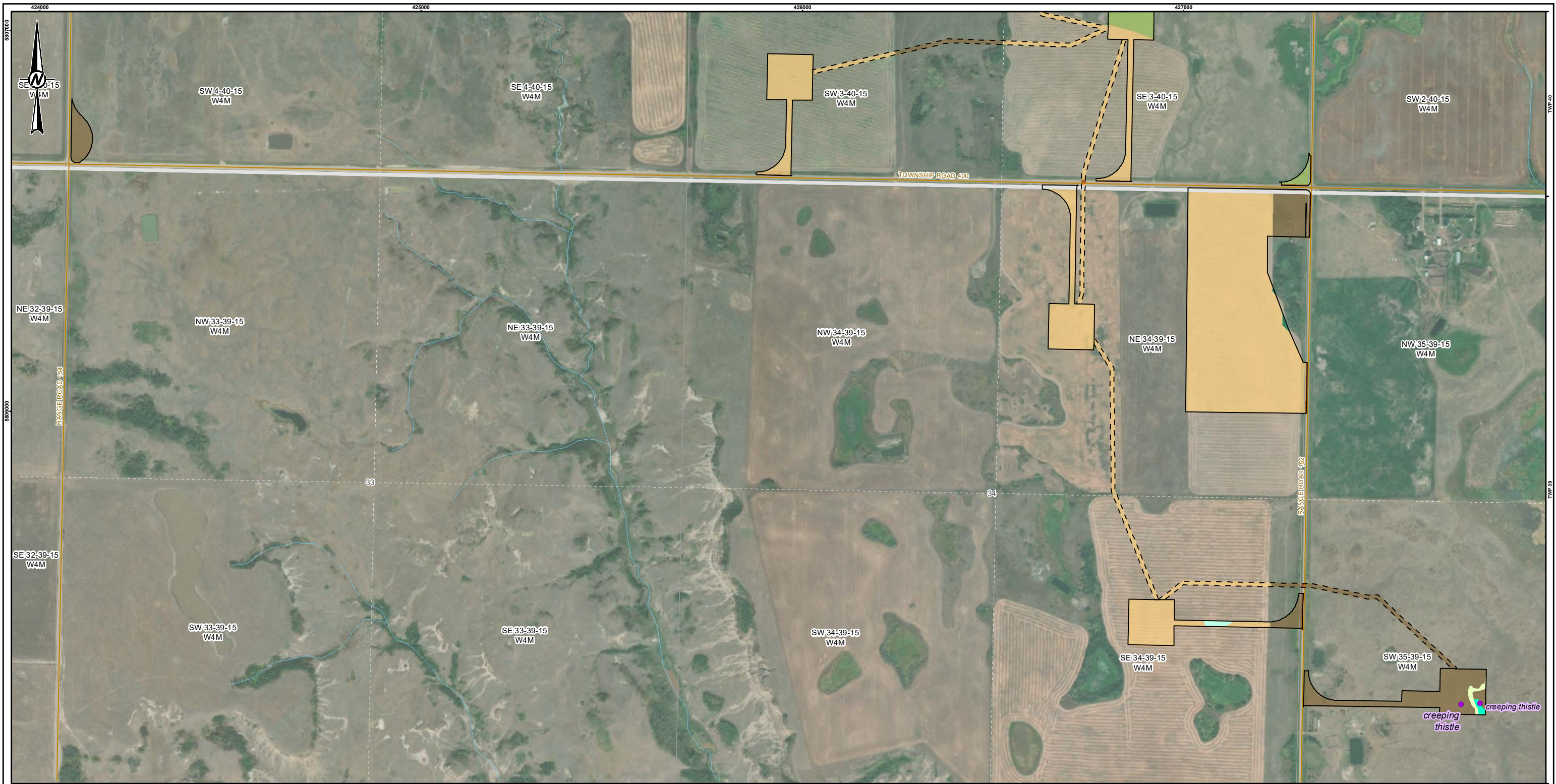
PROJECT
HALKIRK 2 WIND POWER PROJECT

TITLE
LAND COVER, WETLANDS, AND WEEDS WITHIN THE PROJECT FOOTPRINT

PROJECT NO.	CONTROL	REV.	FIGURE
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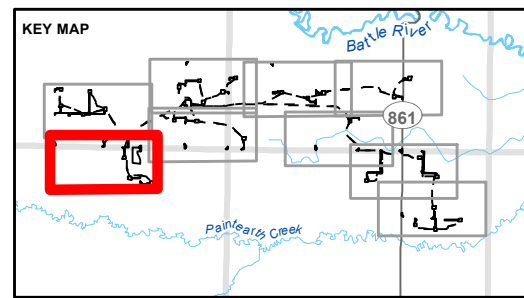
IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B



- LEGEND**
- NOXIOUS WEED SPECIES OBSERVATION
 - FOOTPRINT BOUNDARY**
 - FOOTPRINT (WITHOUT CRANE PATH)
 - - - UNDERGROUND COLLECTOR SYSTEM
 - BASE FEATURES**
 - LOCAL ROAD
 - WATERCOURSE

- LAND COVER**
- ASPEN OR MIXED FOREST
 - CULTIVATED
 - MODIFIED GRASSLAND
 - ROAD
 - TAME PASTURE OR HAY
 - NATURAL DRAINAGE

- WETLAND AND WATERBODY PERMANENCE**
- EPHEMERAL WATERBODY
 - TEMPORARY GRAMINOID MARSH
 - SEASONAL GRAMINOID MARSH



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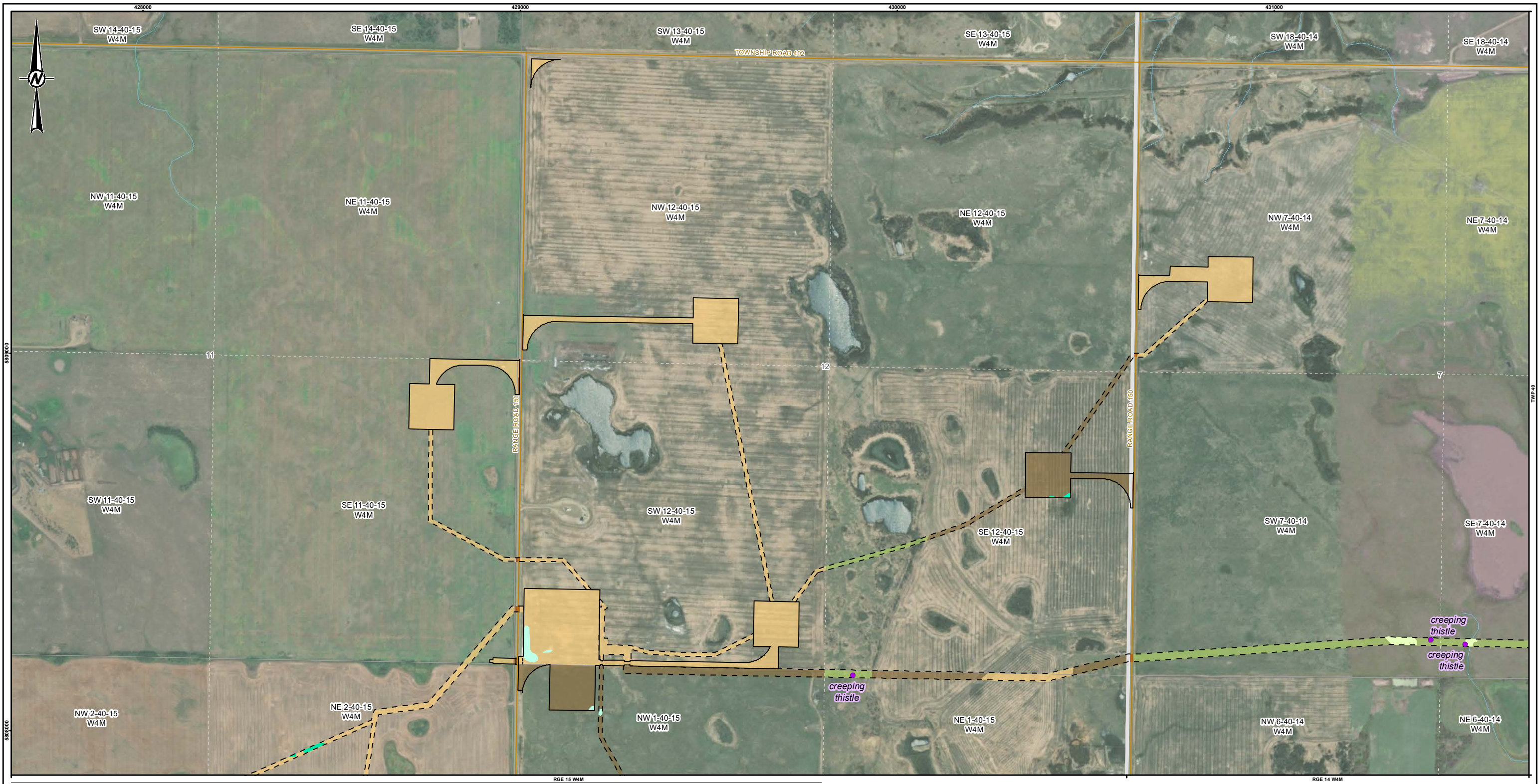
PROJECT
HALKIRK 2 WIND POWER PROJECT

TITLE
LAND COVER, WETLANDS, AND WEEDS WITHIN THE PROJECT FOOTPRINT

PROJECT NO.	CONTROL	REV.	FIGURE
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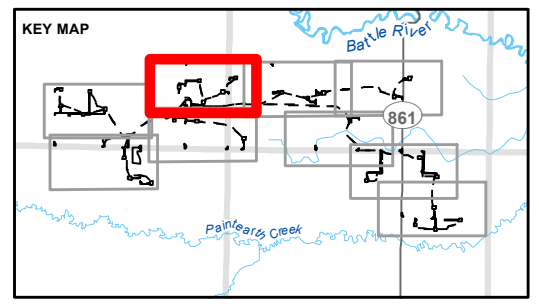
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- LEGEND**
- NOXIOUS WEED SPECIES OBSERVATION
 - FOOTPRINT BOUNDARY**
 - FOOTPRINT (WITHOUT CRANE PATH)
 - - - UNDERGROUND COLLECTOR SYSTEM
 - BASE FEATURES**
 - LOCAL ROAD
 - WATERCOURSE

- LAND COVER**
- CULTIVATED
 - MODIFIED GRASSLAND
 - ROAD
 - TAME PASTURE OR HAY
 - NATURAL DRAINAGE

- WETLAND AND WATERBODY PERMANENCE**
- EPHEMERAL WATERBODY
 - TEMPORARY GRAMINOID MARSH
 - SEASONAL GRAMINOID MARSH



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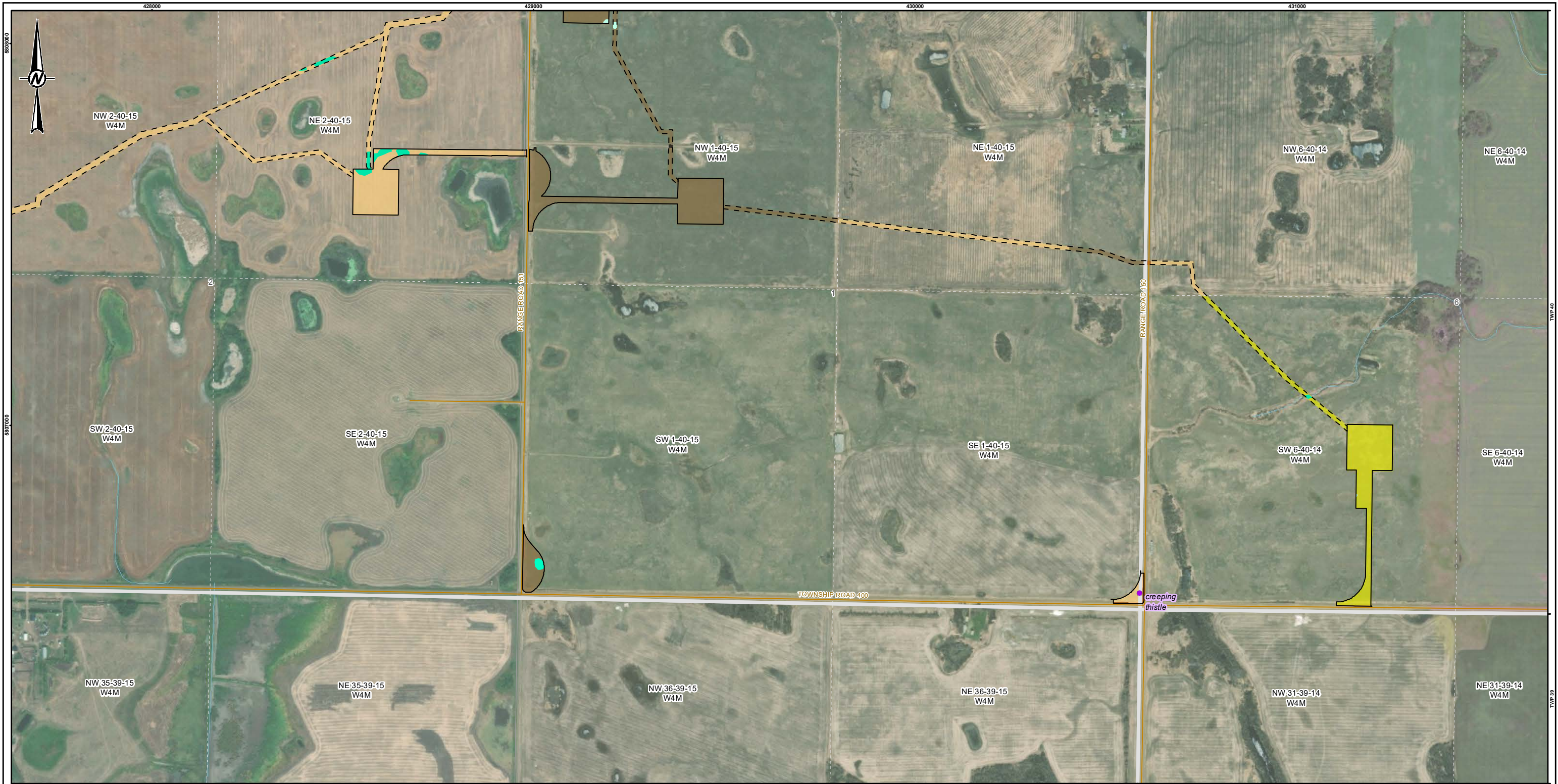
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TITLE
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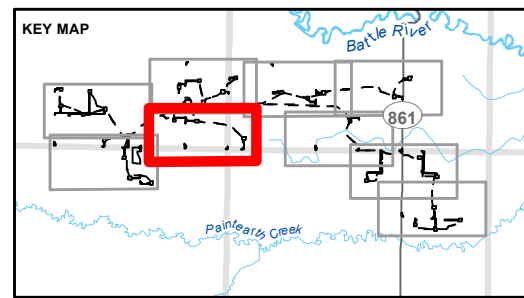
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 - FOOTPRINT (WITHOUT CRANE PATH)
 - UNDERGROUND COLLECTOR SYSTEM
 - LOCAL ROAD
 - WATERCOURSE
- LAND COVER**
- CULTIVATED
 - DEVELOPED
 - MODIFIED PASTURE
 - ROAD
 - TAME PASTURE OR HAY
- WETLAND AND WATERBODY PERMANENCE**
- EPHEMERAL WATERBODY
 - TEMPORARY GRAMINOID MARSH
 - SEASONAL GRAMINOID MARSH



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PROJECT
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TITLE
LAND COVER, WETLANDS, AND WEEDS WITHIN THE PROJECT FOOTPRINT

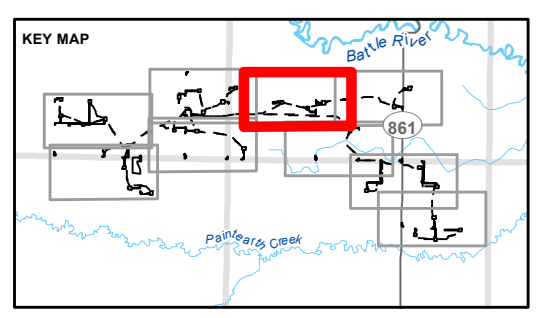
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 - FOOTPRINT BOUNDARY**
 - FOOTPRINT (WITHOUT CRANE PATH)
 - UNDERGROUND COLLECTOR SYSTEM
 - BASE FEATURES**
 - LOCAL ROAD
 - WATERCOURSE
 - LAND COVER**
 - ASPEN OR MIXED FOREST
 - CULTIVATED
 - MODIFIED GRASSLAND
 - ROAD
 - NATURAL DRAINAGE
 - WETLAND AND WATERBODY PERMANENCE**
 - EPHEMERAL WATERBODY
 - SEMI-PERMANENT GRAMINOID MARSH



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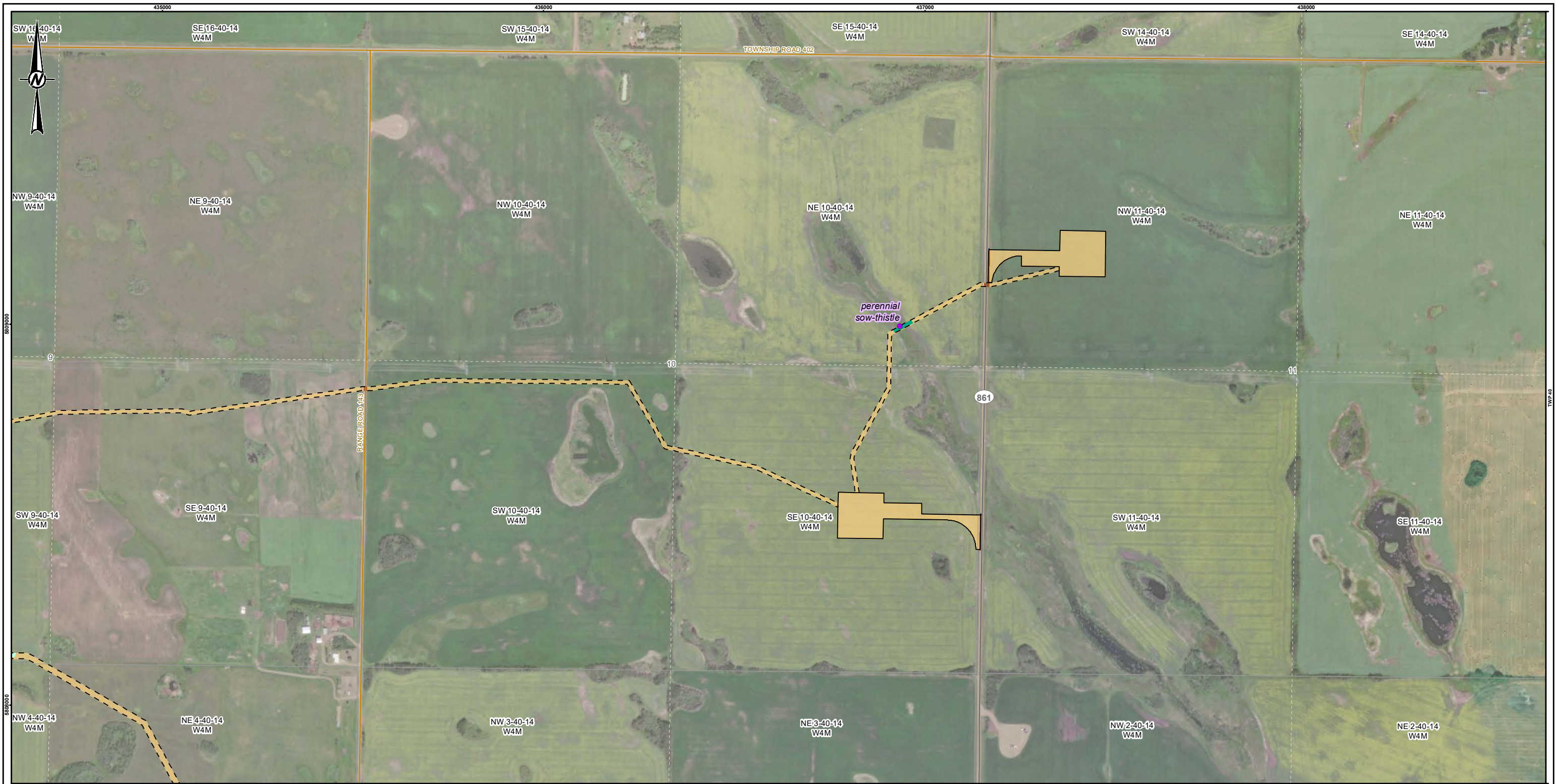
PROJECT
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TITLE
LAND COVER, WETLANDS, AND WEEDS WITHIN THE PROJECT FOOTPRINT

PROJECT NO.	CONTROL	REV.	FIGURE
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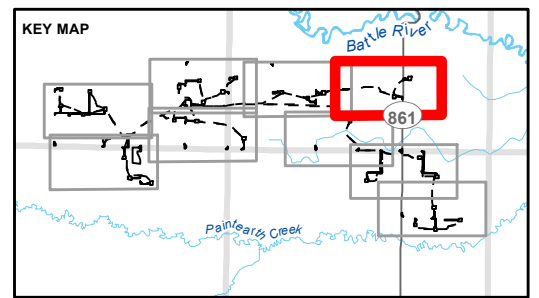
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- LEGEND**
- NOXIOUS WEED SPECIES OBSERVATION
 - FOOTPRINT BOUNDARY**
 - FOOTPRINT (WITHOUT CRANE PATH)
 - - - UNDERGROUND COLLECTOR SYSTEM
 - BASE FEATURES**
 - SECONDARY HIGHWAY
 - LOCAL ROAD

- LAND COVER**
- CULTIVATED
 - ROAD

- WETLAND AND WATERBODY PERMANENCE**
- EPHEMERAL WATERBODY
 - TEMPORARY GRAMINOID MARSH
 - SEMI-PERMANENT GRAMINOID MARSH



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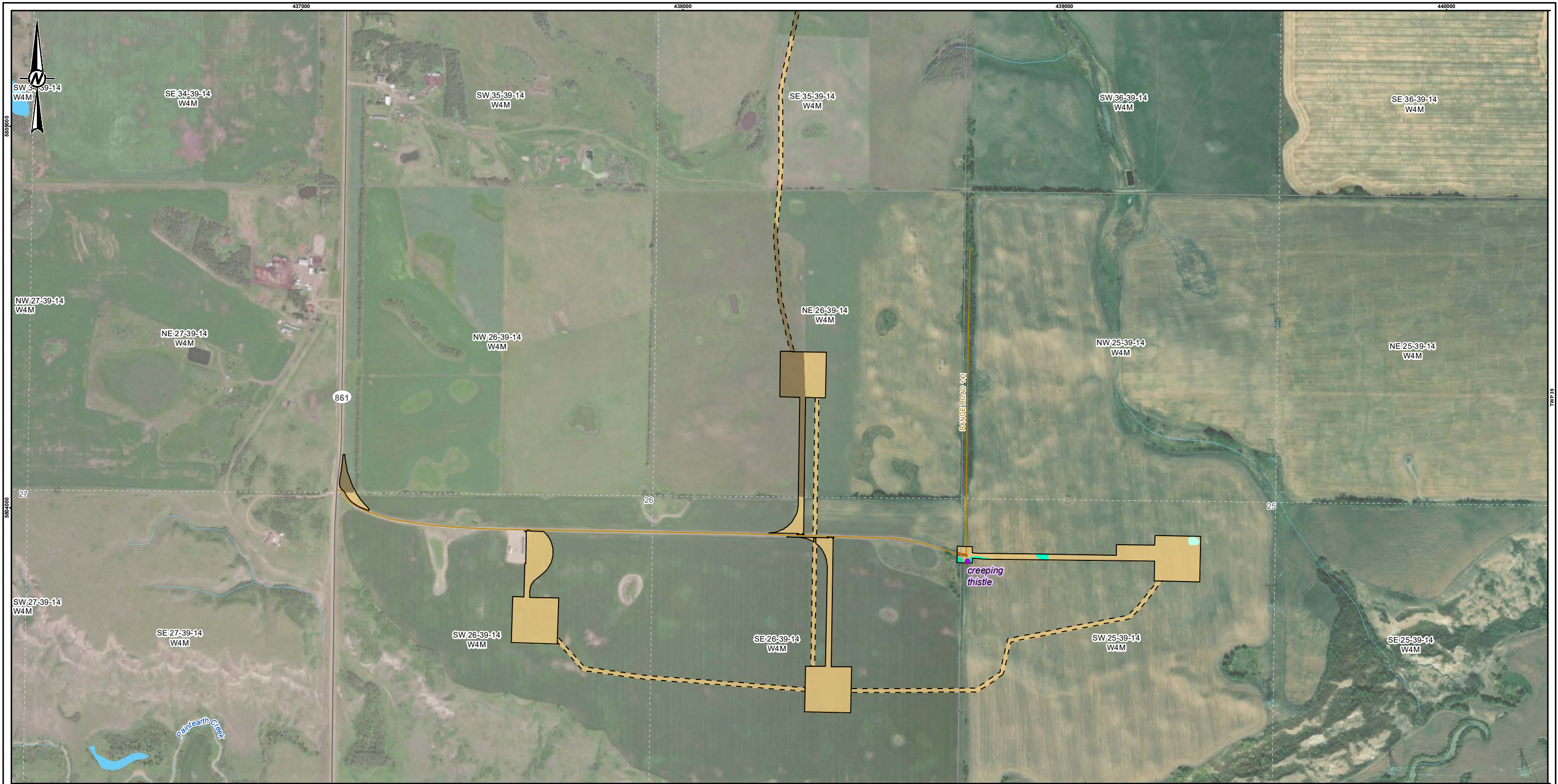
PROJECT
HALKIRK 2 WIND POWER PROJECT

TITLE
LAND COVER, WETLANDS, AND WEEDS WITHIN THE PROJECT FOOTPRINT

PROJECT NO.	CONTROL	REV.	FIGURE
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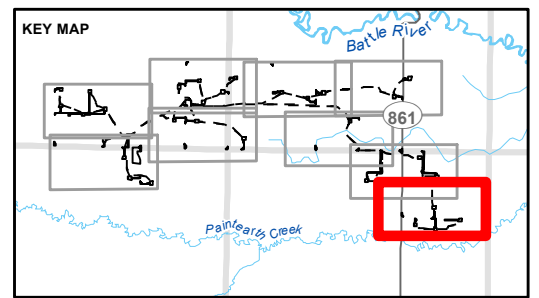
IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B



- LEGEND**
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 - FOOTPRINT BOUNDARY**
 - FOOTPRINT (WITHOUT CRANE PATH)
 - - - UNDERGROUND COLLECTOR SYSTEM
 - BASE FEATURES**
 - SECONDARY HIGHWAY
 - LOCAL ROAD
 - WATERCOURSE
 - WATERBODY

- LAND COVER**
- CULTIVATED
 - ROAD
 - TAME PASTURE OR HAY

- WETLAND AND WATERBODY PERMANENCE**
- EPHEMERAL WATERBODY
 - TEMPORARY GRAMINOID MARSH
 - SEASONAL GRAMINOID MARSH



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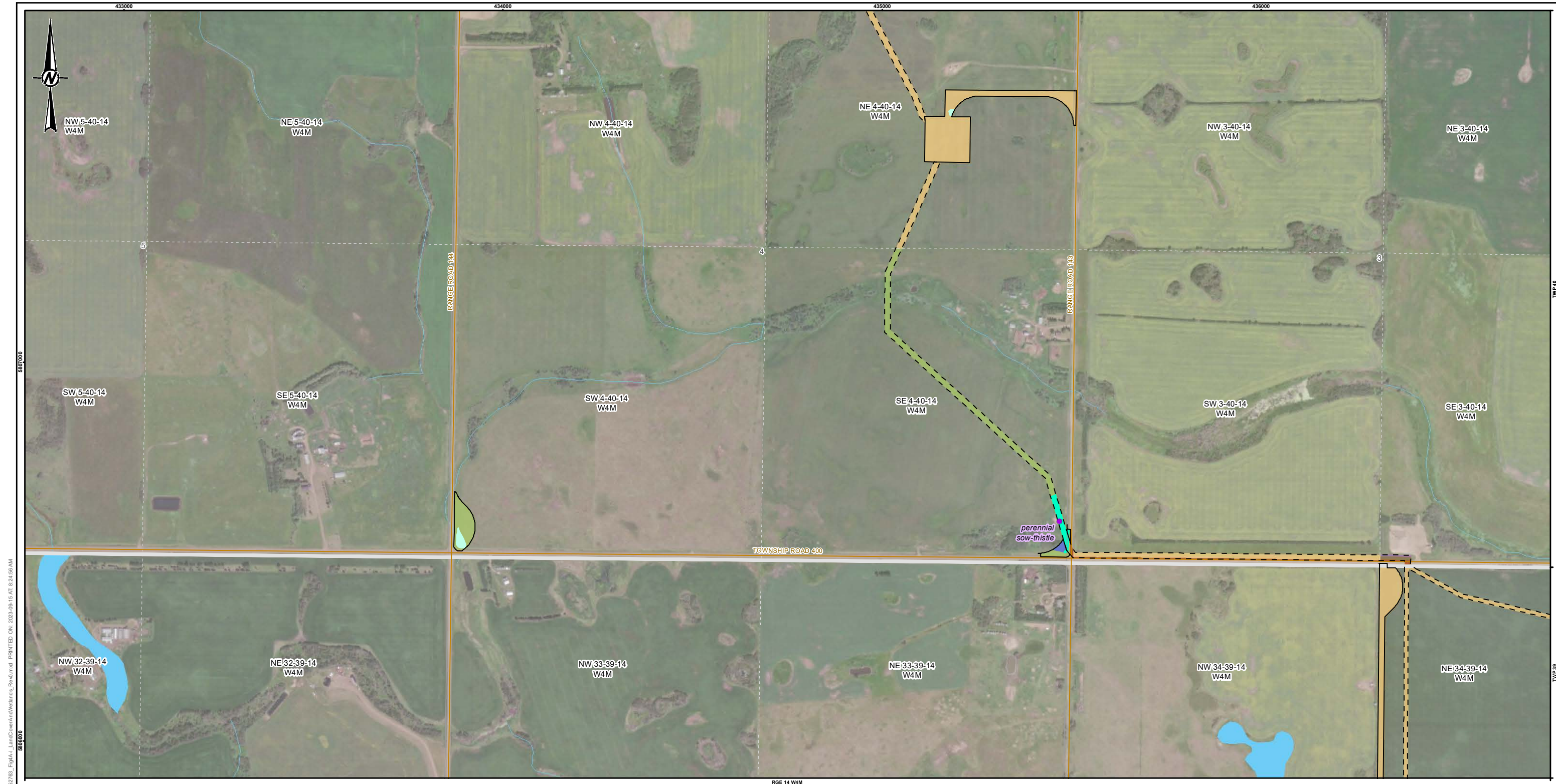
PROJECT
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TITLE
LAND COVER, WETLANDS, AND WEEDS WITHIN THE PROJECT FOOTPRINT

PROJECT NO.	CONTROL	REV.	FIGURE
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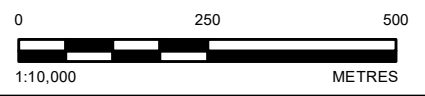
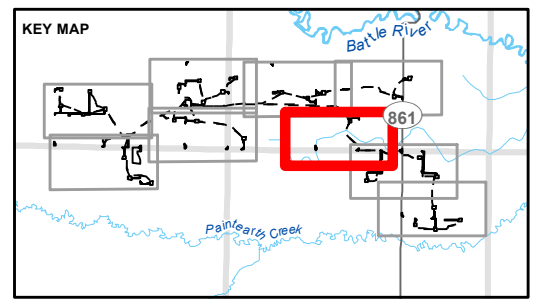
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PROJECT

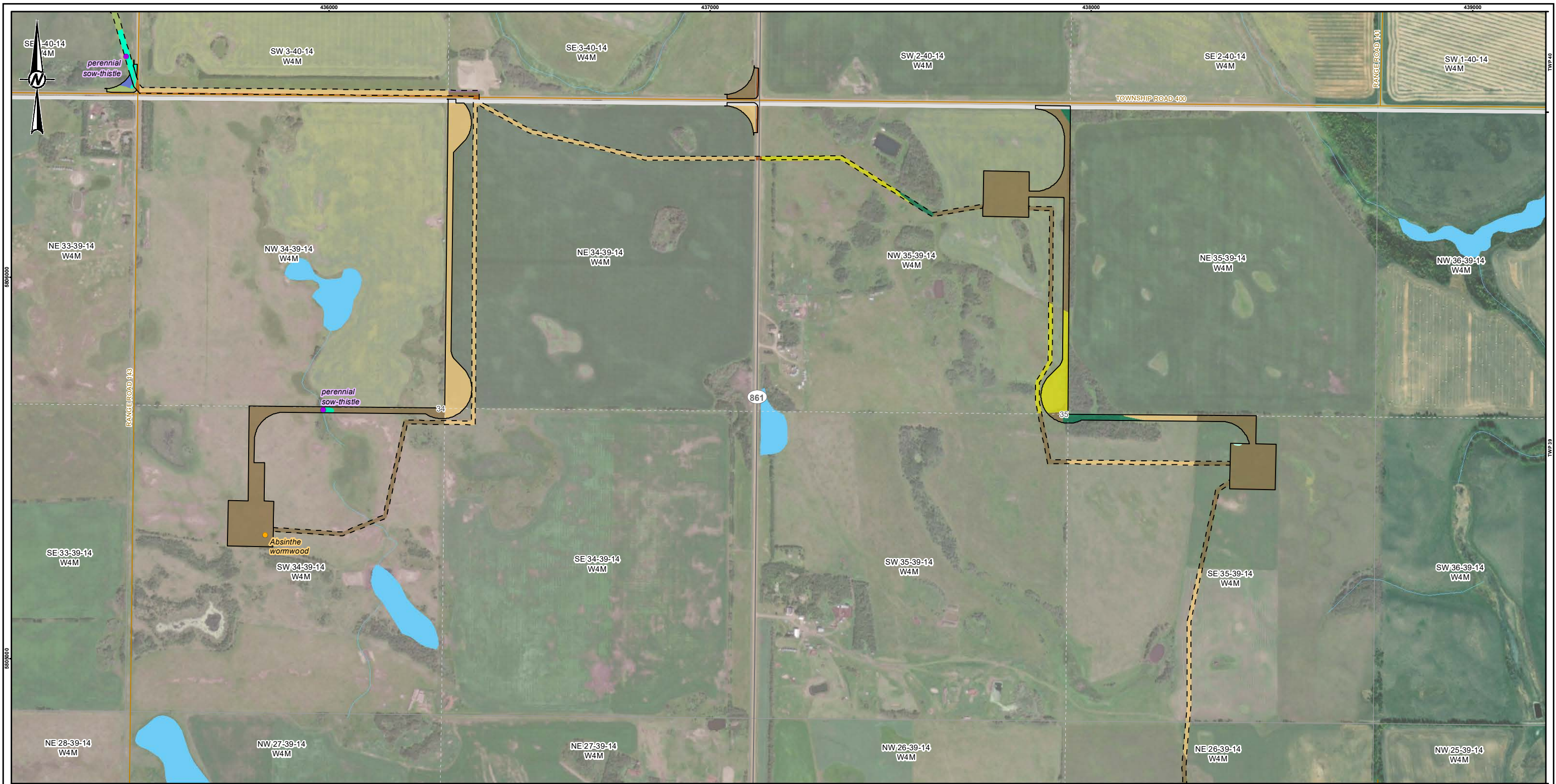
HALKIRK 2 WIND POWER PROJECT

TITLE

LAND COVER, WETLANDS, AND WEEDS WITHIN THE PROJECT FOOTPRINT

PROJECT NO.	CONTROL	REV.	FIGURE
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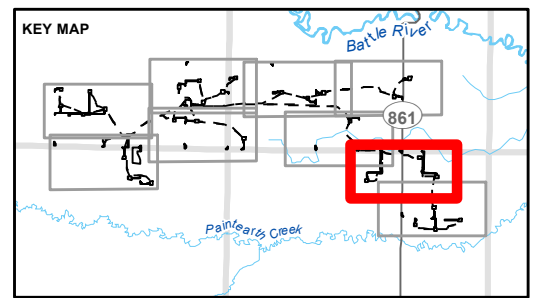
IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B



- LEGEND**
- NOXIOUS WEED SPECIES OBSERVATION
 - WEED OF CONCERN BY THE COUNTY OF PAINTEARTH
- FOOTPRINT BOUNDARY**
- FOOTPRINT (WITHOUT CRANE PATH)
 - - - UNDERGROUND COLLECTOR SYSTEM
- BASE FEATURES**
- SECONDARY HIGHWAY
 - LOCAL ROAD
 - WATERCOURSE
 - WATERBODY

- LAND COVER**
- ASPEN OR MIXED FOREST
 - CULTIVATED
 - FARM YARD
 - MODIFIED GRASSLAND
 - MODIFIED PASTURE
 - ROAD
 - TAME PASTURE OR HAY

- WETLAND AND WATERBODY PERMANENCE**
- EPHEMERAL WATERBODY
 - TEMPORARY GRAMINOID MARSH
 - SEASONAL GRAMINOID MARSH
 - SEASONAL SHRUBBY SWAMP



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PROJECT
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TITLE
LAND COVER, WETLANDS, AND WEEDS WITHIN THE PROJECT FOOTPRINT

PROJECT NO.	CONTROL	REV.	FIGURE
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Table 5: Wetlands and Water bodies within the Project's Limit of Disturbance (LOD)

Water Body Type	Water Permanence	Limit of Disturbance (LOD)	
		Area [ha]	% of the LOD
Construction Footprint			
Graminoid Marsh	Temporary (II)	0.3	0.2
	Seasonal (III)	0.3	0.2
Shrubby Swamp	Seasonal (III)	0.1	<0.1
Waterbodies			
Natural Drainage		0.1	0.1
Ephemeral Waterbody		0.8	0.6
Subtotal		1.6	1.2
Underground Collector System			
Graminoid Marsh	Temporary (II)	0.3	0.2
	Seasonal (III)	0.1	0.1
	Semi-Permanent (IV)	0.1	0.1
Shrubby Swamp	Temporary (II)	<0.1	<0.1
Waterbodies			
Natural Drainage		0.2	0.1
Ephemeral Waterbody		0.2	0.1
Subtotal		0.9	0.6
Wetlands/Water bodies TOTAL		2.5	1.8

3.2.2 Invasive Species and Weeds

Thirty-one weed species were identified within the LOD during the field surveys, including three regulated noxious weeds, and twenty-eight non-regulated exotic species (Table 6). The three regulated weeds were identified as creeping thistle, perennial sow thistle, and common tansy (*Tanacetum vulgare*). These are listed as noxious under the Alberta *Weed Control Act* and regulations (GOA 2016; GOA 2022b), which states that noxious weeds must be controlled. Based on field surveys, these weeds were recorded as having coverage between 1% to 5% within the vegetation plots in the LOD. In addition, Absinthe wormwood (*Artemisia absinthium*) was identified during the June 2022 rare plant surveys at one plot, and this species has been designated as a weed of concern by the County of Paintearth (2020). In addition, scentless chamomile (*Tripleurospermum inodorum*), toadflax (*Linaria vulgaris*), and white cockle (*Silene latifolia*) are also major designated weeds of concern by the County and listed as noxious (GOA 2016; 2022b). However, these were not found during the vegetation surveys.

Table 6: Identified Weed Species Observed during 2022 Field Surveys of the Project's Limit of Disturbance (LOD)

Scientific Name^(a)	Common Name	Locations (UTM) in the LOD^(d)
<i>Medicago sativa</i>	alfalfa	-
<i>Agropyron cristatum</i>	crested wheatgrass	-
<i>Artemisia absinthium</i> ^(b)	absinthe wormwood	12 U 427333, 5807383
<i>Avena fatua</i>	wild oat	-
<i>Bassia scoparia</i>	summer-cypress	-
<i>Brassica napus</i>	Rapeseed (canola)	-
<i>Bromus inermis</i>	smooth brome	-
<i>Caragana arborescens</i>	common caragana	-
<i>Chenopodium album</i>	lamb's quarters	-
<i>Cirsium arvense</i>^(c)	Canada (creeping) thistle	Several locations
<i>Descurainia sophia</i>	flixweed	-
<i>Echinochloa crus-galli</i>	large barnyard grass	-
<i>Fallopia convolvulus</i>	wild buckwheat	-
<i>Hordeum jubatum</i>	foxtail barley	-
<i>Hordeum vulgare</i>	cultivated barley	-
<i>Matricaria discoidea</i>	pineapple weed	-
<i>Melilotus albus</i>	white sweet clover	-
<i>Melilotus officinalis</i>	yellow sweet clover	-
<i>Plantago major</i>	common plantain	-
<i>Polygonum arenastrum</i>	common knotweed	-
<i>Rumex confertus</i>	dock	-
<i>Rumex crispus</i>	curled dock	-
<i>Tanacetum vulgare</i>^(c)	common tansy	12 U 433868, 5805680
<i>Taraxacum officinale</i>	dandelion	-
<i>Thlaspi arvense</i>	stinkweed	-
<i>Tragopogon dubius</i>	common goat's beard	-
<i>Trifolium hybridum</i>	alsike clover	-
<i>Trifolium pratense</i>	red clover	-
<i>Trifolium repens</i>	white clover	-
<i>Triticum aestivum</i>	common wheat	-
<i>Sonchus arvensis</i>^(c)	perennial sow-thistle	Several locations

(a) Species classed as exotic as per ACIMS (ACIMS 2022).

(b) Designated as a weed of concern by the County of Paintearth (County of Paintearth 2020).

(c) Species classed as noxious according to the *Alberta Weed Control Act and Regulations* (GOA 2016; GOA 2022b).

(d) Locations in LOD provided only for the County's designated weed of concern and regulated, noxious weeds. Refer to Figure 4.
 "-" not applicable

3.2.3 Rare Plant and Ecological Communities

The desktop ACIMS search, and field assessments indicated no rare or listed plant species and ecological community occurrence except for rare species recorded approximately 800 m away from the LOD (ACIMS 2022). This rare species was identified as clammy hedge-hyssop in 14-39-14-W4M with a provincial ranking of S3. No Environmentally Sensitive Areas (ESAs) (Fiera 2014) were documented within the LOD.

As no native grasslands were observed within the LOD, and the landcover is predominately cultivated or tame pasture and hay (Table 4), the LOD is considered to have a low rare plant potential. Native vegetation, particularly native grassland, is regarded as a resource to be protected and carefully managed in Alberta as native grassland is high value habitat for wildlife and plant species (AEP 2018c). Native grassland has the highest likelihood for rare plant potential habitat, but as no native grassland areas are present in the LOD, the rare plant potential in the LOD is low.

4.0 SOIL MANAGEMENT PLAN

4.1 Soil Salvage and Stockpiling

Construction Footprint

The soil salvage plan presented in this SVMP was developed using site-specific data collected during PDSAs, requirements outlined in the C&R Directive (AEP 2018a) and the *Conservation and Reclamation Regulation* under EPEA (GOA 2022a) and construction methods. Per the C&R Directive, topsoil, and upper subsoil (A and B horizons, respectively) must be conserved and replaced in areas where subsoil will be excavated during grading activities (i.e., three-lift soil salvage; AEP 2018a). Project components within the construction footprint may require grading, therefore a three-lift soil salvage approach is described for areas with good to fair upper subsoil reclamation suitability (HND, HNDgl, HNDco, LFE, FMN, and HNDca SMUs). Three-lift soil salvage includes salvaging topsoil (A horizons) and upper subsoil (B horizons) as two separate lifts, with lower subsoil (C horizons) being excavated separately to the design grade depth. This method conserves upper subsoil with good to fair reclamation suitability, which helps re-establish pre-disturbance rooting depths after temporary and/or permanent reclamation. For areas with poor or unsuitable upper subsoil reclamation suitability (OVE, SHR, BFD, FST, HKR, and SHRgl SMUs), a two-lift soil salvage approach is recommended, to mitigate the risk of mixing poor or unsuitable upper subsoil with better quality material during stockpiling activities. Two-lift soil salvage includes salvaging topsoil as one lift, and upper and lower subsoil/grade material as a second lift. In general, topsoil salvage includes A horizon(s) and upper subsoil salvage includes AB and B horizon(s) to a maximum depth of 30 cm (if present).

To comply with regulatory guidance, salvaged topsoil and upper subsoil will be stockpiled in separate piles during Project construction within the construction footprint (AEP 2018a). Upper subsoil from SMUs with poor or unsuitable reclamation suitability and lower subsoil/grade material will not be salvaged and therefore will not stockpiled, however, if these types of soils are piled during grading they must be kept separate from stockpiled subsoil to eliminate the potential for admixing.

Topsoil and subsoil from wetlands (ZGL SMU) will be salvaged in two distinct lifts and stockpiled in discrete topsoil and subsoil stockpiles prior to grading and construction. Wetland topsoil and subsoil stockpiles must be kept separate from non-wetland topsoil and subsoil stockpiles.

Soil stockpiles will be located along access roads and edges of the LOD to avoid negative impacts due to construction activities. Stockpiled soils may not be used as fill material or be moved between land parcels

(AEP 2018a). Stockpiles from non wetland soils will be built in upland areas, away from low-lying areas and/or existing wetlands and dugouts to avoid changes chemical or physical parameter changes to the stockpiled soil. Soil salvage and stockpiling operations should be monitored by an on-site soil monitor or environmental lead who may consult with a qualified soil professional as needed. The soil salvage and stockpiling plan for the soils within the construction footprint is summarized in Table 7.

Table 7: Soil Salvage and Stockpiling Plan for the Construction Footprint

SMU	Soil Salvage Plan	Soil Stockpiling Plan
BFD	Salvage topsoil only, using salvage depths on Project Operational Mapping. Upper subsoil is unsuitable and may be handled with lower subsoil if needed (grade material).	Topsoil can be stockpiled with topsoil from other salt affected SMUs. Create a 1 m or 3 m buffer between BFD topsoil and non salt-affected topsoil and/or wetland topsoils (ZGL).
FST	Salvage topsoil only, using salvage depths on Project Operational Mapping. Upper subsoil is unsuitable and may be handled with lower subsoil if needed (grade material).	Topsoil can be stockpiled with topsoil from other salt affected SMUs. Create a 1 m or 3 m buffer between FST topsoil and non salt-affected topsoil and/or wetland topsoils (ZGL).
HKR	Salvage topsoil only, using salvage depths on Project Operational Mapping. Upper subsoil is unsuitable and may be handled with lower subsoil (grade material).	Topsoil can be stockpiled with topsoil from other salt affected SMUs. Create a 1 m or 3 m buffer between HKR topsoil and non salt-affected topsoil and/or wetland topsoils (ZGL).
HND	Salvage topsoil and upper subsoil in two distinct lifts using salvage depths on Project Operational Mapping.	Topsoil and subsoil may be stockpiled with non-salt-affected SMUs. Create a 1 m or 3 m buffer between HND and salt-affected topsoil and/or wetland soils (ZGL).
HNDca	Salvage topsoil and upper subsoil in two distinct lifts using salvage depths on Project Operational Mapping.	Topsoil and subsoil may be stockpiled with non-salt-affected SMUs. Create a 1 m or 3 m buffer between HNDca and salt-affected topsoil and/or wetland soils (ZGL).
HNDco	Salvage topsoil and upper subsoil in two distinct lifts using salvage depths on Project Operational Mapping.	Topsoil and subsoil may be stockpiled with non-salt-affected SMUs. Create a 1 m or 3 m buffer between HNDco and salt-affected topsoil and/or wetland soils (ZGL).
HNDgl	Salvage topsoil and upper subsoil in two distinct lifts using salvage depths on Project Operational Mapping.	Topsoil and subsoil may be stockpiled with non salt-affected SMUs. Create a 1 m or 3 m buffer between HNDgl and salt-affected topsoil and/or wetland soils (ZGL).
LFE	Salvage topsoil and upper subsoil in two distinct lifts using salvage depths on Project Operational Mapping.	Topsoil and subsoil may be stockpiled with non-salt-affected SMUs. Create a 1 m or 3 m buffer between LFE and salt-affected topsoil and/or wetland soils (ZGL).
OVE	Salvage topsoil only, using salvage depths on Project Operational Mapping. Upper subsoil is unsuitable and may be handled with lower subsoil (grade material).	Topsoil can be stockpiled with topsoil from other salt affected SMUs. Create a 1 m or 3 m buffer between OVE topsoil and non salt-affected topsoil and/or wetland topsoils (ZGL).
OVEgl	Salvage topsoil only, using salvage depths on Project Operational Mapping. Upper subsoil is unsuitable and may be handled with lower subsoil (grade material).	Topsoil can be stockpiled with topsoil from other salt affected SMUs. Create a 1 m or 3 m buffer between OVEgl topsoil and non salt-affected topsoil and/or wetland topsoils (ZGL).
SHR	Salvage topsoil only, using salvage depths on Project Operational Mapping. Upper subsoil is unsuitable and may be handled with lower subsoil (grade material).	Topsoil can be stockpiled with topsoil from other salt affected SMUs. Create a 1 m or 3 m buffer between SHR topsoil and non salt-affected topsoil and/or wetland topsoils (ZGL).
SHRgl	Salvage topsoil only, using salvage depths on Project Operational Mapping. Upper subsoil is unsuitable and may be handled with lower subsoil (grade material).	Topsoil can be stockpiled with topsoil from other salt affected SMUs. Create a 1 m or 3 m buffer between SHRgl topsoil and non salt-affected topsoil and/or wetland topsoils (ZGL).
FMN	No soil salvage recommendations provided. Follow wetland mitigations and approvals for disturbance.	Topsoil and subsoil may be stockpiled with non salt-affected SMUs. Create a 1 m or 3 m buffer between FMN and salt-affected topsoil and/or wetland soils (ZGL).
ZDL	No soil salvage.	N/A
ZGL	Salvage topsoil and upper subsoil in two distinct lifts using salvage depths on Project Operational Mapping.	Stockpile topsoil and subsoil with ZGL topsoil and subsoil only. Create a 1 m or 3 m buffer between ZGL and soil from all other SMUs.

Notes: N/A = Not Applicable

Underground Collector System Footprint

The underground collector system will be installed using a plough-in method, which does not entail site grading; therefore, soil salvage is not recommended for areas with good to fair upper subsoil reclamation suitability. However, given the prevalence of salt affected soils within the LOD, and the physical characteristics of salt-affected upper subsoil (i.e., hard, dry consistence), topsoil salvage is recommended for the OVE, SHR, BFD, FST, HKR, and SHRgl SMUs to mitigate the risk of admixing saline/sodic upper subsoil with topsoil during collector line installation if work is being conducted under frozen conditions

The soil salvage and stockpiling plan for the underground collector system footprint is summarized in Table 8. If trenching methods are necessary for collector line installation, the methods described for the construction footprint will apply. Topsoil and upper subsoil horizon depths for the underground collector system footprint have been provided on operational mapping in Appendix B.

Table 8: Soil Salvage and Stockpiling Plan for the Underground Collector System Footprint

SMU	Soil Salvage Plan	Soil Stockpiling Plan
BFD	Salvage topsoil prior to ploughing in collector line.	Topsoil will be stockpiled temporarily along collector line footprint and replaced immediately following collector line installation.
FST	No topsoil or upper subsoil salvage.	N/A
HKR	Salvage topsoil prior to ploughing in collector line.	Topsoil will be stockpiled temporarily along collector line footprint and replaced immediately following collector line installation.
HND	No topsoil or upper subsoil salvage.	N/A
HNDco	No topsoil or upper subsoil salvage.	N/A
HNDgl	No topsoil or upper subsoil salvage.	N/A
LFE	No topsoil or upper subsoil salvage.	N/A
OVE	Salvage topsoil prior to ploughing in collector line.	Topsoil will be stockpiled temporarily along collector line footprint and replaced immediately following collector line installation.
OVEgl	Salvage topsoil prior to ploughing in collector line.	Topsoil will be stockpiled temporarily along collector line footprint and replaced immediately following collector line installation.
SHR	Salvage topsoil prior to ploughing in collector line.	Topsoil will be stockpiled temporarily along collector line footprint and replaced immediately following collector line installation.
SHRgl	Salvage topsoil prior to ploughing in collector line.	Topsoil will be stockpiled temporarily along collector line footprint and replaced immediately following collector line installation.
FMN	No topsoil or upper subsoil salvage.	N/A
ZDL	No topsoil or upper subsoil salvage.	N/A
ZGL	No soil salvage recommendations provided. Follow wetland mitigations and approvals for disturbance.	No soil stockpiling recommendations provided. Follow wetland mitigations and approvals for disturbance.

4.1.1 Soil Salvage Best Management Practices

The following BMPs will apply to soil salvage activities within the construction footprint and underground collector system footprint:

- The contractor environmental lead should have a soil specialist on site to serve as a soil monitor with equipment operators during soil stripping and stockpiling activities to provide guidance on soil handling (i.e., guidance on soil type and handling, stockpile type) (AEP 2018a).
- Due to natural variation in soil horizon depths and topography, as well as the prevalence of salt-affected soils within the LOD, a qualified soil professional should be on site with equipment operators to provide guidance on soil handling (e.g., guidance on soil type, soil salvage depths, stockpile type, etc.) (AEP 2018a). The Proponent may choose to assign these activities to their on-site environmental lead, who can consult with a qualified soil professional as needed.
- Topsoil and upper subsoil (where applicable) will be salvaged using site-specific soil horizon depths provided in operational mapping in Appendix B. While colour change can be an excellent way to distinguish between topsoil and subsoil horizons during salvage operations, soils within the LOD showed both distinct and indistinct (poor) colour changes; therefore, operational mapping should be closely followed.
- Soil salvage activities will be undertaken during favorable conditions (i.e., daylight, non-frozen, and dry), and avoided when conditions are excessively wet to prevent the loss of soil structure and reduce the risk of compaction, and water erosion. Soil salvage will be halted when wind speeds cause visible soil wind erosion (e.g., dusty conditions, displacement of surface soil within LOD or adjacent areas).
- If wind erosion is observed, work will be halted, and mitigations will be assessed prior to work restarting. Mitigations may include but are not limited to applying water to keep dust down, covering affected areas with geotextile or straw to avoid further erosion, or other site-specific methods. Affected area(s) will be delineated and included in a daily field report.
- Soil handling and traffic should be avoided during wet conditions as these exacerbate the risk of rutting, compaction, and erosion. If compaction, rutting, and/or water erosion are observed, work will be halted, and mitigations will be assessed prior to work restarting. Mitigations may include work stoppage until field conditions are dry, placing rig mats in wet areas, or other site-specific mitigations. Affected area(s) will be delineated and included in a daily field report.
- If admixing between topsoil, upper subsoil, and/or lower subsoil/grade material is observed, work will be halted, and mitigations will be assessed prior to work restarting. Mitigations may include having an onsite soil monitor do depth checks ahead of salvage equipment, segregating admixed soils from non-admixed soils, or other site-specific mitigations. Affected area(s) will be delineated and included in a daily field report.
- Light vehicles and heavy equipment may not refuel or have maintenance performed while parked on undisturbed or reclaimed soils and must have a drip tray while parked to avoid contamination.
- Heavy equipment used for soil salvage should be tracked or use low weight bearing tires to avoid compaction.

The following additional BMPs will apply during the installation of the underground collector system:

- In cultivated lands where salt-affected soils have been identified, it is recommended that topsoil will be salvaged and windrowed prior to ploughing in collector lines during periods of frozen ground conditions to avoid mixing salt-affected upper subsoil into topsoil. This mitigation does not apply to native grassland land uses, where minimal disturbance is preferred.
- The volume of soil being displaced by the implement used for ploughing in collector lines will be minimized to the extent possible by using an implement that is an appropriate size for the task.
- Where possible, leave crop residue or sod intact prior to ploughing in collector lines to minimize compaction.

4.1.2 Soil Stockpiling Best Management Practices

The following BMPs will apply to soil stockpiling operations:

- Topsoil, subsoil, and grade material will be stored in distinct stockpiles at least 1 m apart within the LOD (AEP 2018a). If soils are to be stockpiled for longer than 6 months, stockpiles will be built a minimum of 1 m apart, sloped, and seeded to prevent erosion during storage (AEP 2018a). In areas with cultivated land uses, topsoil may be “feathered in” to surrounding areas. The areas where topsoil is being stored must be delineated and the locations must be tracked and recorded in the Project’s C&R Plan to avoid material loss (AEP 2018a).
- Erosion control techniques will be applied to stockpiles and/or feathered in topsoil, depending on the intended duration of storage. Short term (i.e., less than six months) stockpiles may have the addition of cover material (e.g., straw) or track packing. Long term stockpiles (i.e., over six months) will be seeded with an approved, rapidly establishing vegetative species.
- If tackifier is used on long term stockpiles in place of seeding, the tackifier will be re-applied and reseeded as needed if erosion is observed.
- Stockpiles will be monitored and managed for erosion and invasive plant establishment on an ongoing basis.
- Stockpiles should be located as close to soil salvage sources as possible to minimize hauling distances and be located in areas that are easily accessible during site reclamation. Stockpiles should also be located out of the path of construction traffic, so they are not driven on.
- Stockpile locations, dimensions, and material types will be tracked and recorded in the Project Conservation and Reclamation Plan and will be clearly marked with signage to identify the material type (AEP 2018a).
- Stockpiles will be built a minimum of 10 m away from waterbodies and/or wetlands to reduce the risk of sedimentation. Stockpiles will not be built in low-lying or wet areas to avoid anoxic conditions and potential changes in soil quality.
- Topsoil stockpiles will be built in well-drained upland areas with soils of the same SMU or of other SMUs with similar material, identified in Table 7, and on top of undisturbed topsoil (i.e., “like on like”). Topsoil stockpiles may be built on undisturbed upper subsoil but may not be built on undisturbed lower subsoil (grade material) to avoid admixing with underlying deleterious materials.
- Upper subsoil stockpiles will be built in well-drained upland areas with soils of the same SMU or of other SMUs with similar material, identified in Table 7 (i.e., “like on like”). Upper subsoil stockpiles may be built on ground with undisturbed lower subsoil (grade material) but may not be built on undisturbed topsoil.

- Stockpiled topsoil and upper subsoil will not be used as fill or padding material, or for any use other than site reclamation.

4.2 Temporary and Permanent Reclamation

Reclamation activities take place throughout a Project's life cycle, generally occurring after initial Project construction (temporary) and after Project decommissioning (permanent). Temporary disturbance describes areas that will be reclaimed after construction and will not be used during the operational phase of the Project, including temporary workspace around access roads and turbines, and the laydown yard. Permanent disturbance areas include turbine pads, access roads, and the substation, all of which will be reclaimed after Project decommissioning. The reclamation plan and BMPs described in this SVMP apply to temporary and permanent reclamation activities within the construction footprint and underground collector system footprint and are discussed together. This reclamation plan may be updated in the future as reclamation techniques advance and with changes in regulations.

Following construction, temporary disturbance areas will be prepared for soil replacement, reclaimed, and revegetated to stabilize soil and terrain, and mitigate erosion and weed establishment. Disturbed areas will be recontoured as needed to mimic surrounding landforms and drainage patterns and tied-in to the surrounding landscape. If lower subsoil and/or grade material is compacted after grading, the surface will be decompacted (e.g., deep-ripped) as needed to alleviate compaction. Surfaces will be smoothed prior to soil replacement to avoid admixing reclamation material with underlying grade material. Where applicable, upper subsoil will be replaced, followed by topsoil, using salvage depths and material types displayed on the operational mapping in Appendix B (i.e., salvage depths and replacement depths are the same).

Surface preparation and soil replacement should be monitored by an on-site soil monitor or environmental lead who may consult with a qualified soil professional as needed.

4.2.1 Reclamation Material Balance

The reclamation material balance for topsoil and upper subsoil within the construction footprint is provided in Table 9. The reclamation material balance for topsoil within the underground collector system footprint (no upper subsoil salvage) is provided in Table 10.

Table 9: Reclamation Material Balance within the Construction Footprint

SMU	Total SMU Area	Topsoil		Upper Subsoil	
		Average Salvage and Placement Depth ^(a)	Total Salvage and Placement Volume	Average Salvage and Placement Depth ^(a)	Total Salvage and Placement Volume
		ha	m	m ³	m
BFD	7.3	0.17	12,200	-	-
FMN	0.6	0.28	1,700	0.20	1,500
FST	7	0.20	13,100	-	-
HKR	7	0.22	14,000	-	-
HND	35.1	0.18	60,800	0.22	74,400
HNDca	0.2	0.15	300	0.3	600
HNDco	1.1	0.15	1,500	0.25	2,800
HNDgl	4.9	0.16	7,800	0.26	12,700
LFE	1	0.23	2,300	0.20	2,000
OVE	17.1	0.15	25,200	-	-
OVEgl	<0.1	0.15	<100	-	-
SHR	17.2	0.15	23,800	-	-
SHRgl	0.1	0.20	200	-	-
ZDL	2.4	-	-	-	-
ZGL	2.3	0.17	3,900	0.23	5,300
Total	103.3	-	174,400	-	101,800

"-" = not applicable

Some numbers are rounded for presentation purposes; therefore, totals may not equal the sum of the individual values.

(a) Average depths used for calculation purposes only. Actual salvage depths presented on operation mapping in Appendix B

Table 10: Reclamation Material Balance within the Underground Collector System Footprint

SMU	Total SMU Area	Topsoil		Upper Subsoil ^(b)	
		Average Salvage and Placement Depth ^(a)	Total Salvage and Placement Volume	Average Salvage and Placement Depth ^(a)	Total Salvage and Placement Volume
		ha	m	m ³	m
BFD	4.0	0.16	6,400	-	-
FMN	0.2	-	-	-	-
FST	4.9	-	-	-	-
HKR	3.4	0.23	7,800	-	-
HND	14.7	-	-	-	-
HNDco	0.3	-	-	-	-
HNDgl	0.6	-	-	-	-
LFE	0.1	-	-	-	-
OVE	8.6	0.16	13.8	-	-
OVEgl	0.2	0.15	300	-	-
SHR	4.9	0.16	7,800	-	-
ZDL	1.7	-	-	-	-
ZGL	1.1	0.16	1,800	-	-
Total	44.6	-	37,900	-	-

"-" = not applicable

Some numbers are rounded for presentation purposes; therefore, totals may not equal the sum of the individual values.

(a) Average depths used for calculation purposes only. Actual salvage depths presented on operation mapping in Appendix B

(b) SVMP assumes plough in construction method for underground collector system, therefore no upper subsoil salvage is recommended.

4.2.2 Soil Replacement Best Management Practices

The following BMPs will apply to soil replacement operations:

- A soil specialist should be on site with equipment operators during reclamation activities to provide guidance on soil handling (i.e., guidance on soil type, soil replacement depths, and stockpile type) (AEP 2018a). The Proponent may choose to assign these activities to their on-site environmental lead, who can consult with a soil specialist as needed.
- The soil monitor should verify and record soil replacement depths and any soil quality issues observed (i.e., admixing, compaction, etc.) during reclamation activities.
- Upper subsoil will be replaced on the prepared, graded surface, followed by topsoil, using stockpiled soils of the same type as pre-disturbance conditions, targeting pre-disturbance horizon thicknesses.
- Reclamation activities will be undertaken during favorable conditions (i.e., daylight, non-frozen, and dry), and avoided when conditions are excessively wet to prevent the loss of soil structure and reduce the risk of compaction, and water erosion.
- If admixing between topsoil, upper subsoil, and/or lower subsoil/grade material is observed during soil replacement activities, work will be halted, and mitigations will be assessed prior to work restarting. Mitigations may include having an onsite soil monitor verifying upper subsoil placement depths prior to topsoil replacement, segregating admixed soils from non-admixed soils, or other site-specific mitigations. Affected area(s) will be delineated and included in a daily field report.
- If compaction, rutting, and/or water erosion are observed, work will be halted, and mitigations will be assessed prior to work restarting. Mitigations may include work stoppage until field conditions are dry, placing rig mats in wet areas, deep-ripping grade and/or placed upper subsoil material, or other site-specific mitigations. Affected area(s) will be delineated and included in a daily field report.
- Reclamation activities will be halted when wind speeds cause visible soil wind erosion (e.g., dusty conditions, displacement of surface soil within LOD or adjacent areas).
- If wind erosion is observed, work will be halted, and mitigations will be assessed prior to work restarting. Mitigations may include but are not limited to applying water to keep dust down, covering affected areas with geotextile or straw to avoid further erosion, or other site-specific methods. Affected area(s) will be delineated and included in a daily field report.
- Light vehicles and heavy equipment may not refuel or have maintenance performed while parked on undisturbed or reclaimed soils and must have a drip tray while parked to avoid contamination.
- Heavy equipment used for soil replacement should be tracked or use low weight bearing tires to avoid compaction.

5.0 VEGETATION MANAGEMENT PLAN

5.1 Revegetation

Revegetation will be initiated as soon as possible following subsoil and topsoil placement to mitigate erosion and invasive species establishment. Seed mixes and revegetation techniques (seeding rates, site preparation, planting technique and management) will be selected based on site conditions and will align with requirements provided by the local municipal authority and the needs of landowners. The LOD will be reclaimed as per the C&R Regulation (GOA 2022a) by restoring the land to equivalent land capability. Where applicable, the LOD is expected to return to the baseline land use which is dominantly cultivated land and tame pasture (88.7%) with other managed land cover types including managed grassland and pasture (8.5%). Developed areas including road/trail and farmyard will remain as developed areas. Natural areas such as aspen and mixed wood forest will return to equivalent land capability. Permanently impacted wetlands will not be restored following construction and a change in land use is anticipated. Permanent impacts to wetlands will be authorized under the Wetland Assessment and Impact Report (WAIR) and *Water Act*.

A *Water Act* Application accompanied by a WAIR was submitted for ten permanently impacted wetlands consisting of temporary and seasonal graminoid marshes on March 3, 2023 (DAPP0038741). Capital Power is committing to the in-lieu replacement fee option, in compliance with the Alberta *Wetland Policy* (GOA 2013) and Alberta *Wetland Mitigation Directive* (GOA 2018a). In addition, Capital Power will be submitting a Wetland Assessment and Impact Form (WAIF) for the temporarily impacted wetlands. Impacted wetlands will be reclaimed through natural recovery.

Where seeding will occur, selected seed mixes will be approved by the appropriate regulatory authority and/or landowner prior to revegetation. This approval can be acquired in advance of tentative revegetation start dates to prevent any delays in seeding and reclamation activities. The priority of revegetating the LOD is to exclude invasive species and mitigate erosion.

5.1.1 Revegetation Best Management Practices

Cultivated Land Cover

Temporarily disturbed cultivated areas will be retained as cultivation throughout the operational life of the Project and will be regularly seeded with annual crops as directed by the landowner.

Waterbodies and Wetlands

Waterbodies in the limit of disturbance were ephemerally saturated with water and had continuous vegetation with the adjacent landcover. It is expected that adjacent revegetation efforts will be applied to these areas and no specific revegetation practice is applicable to these areas.

Wetlands temporarily disturbed in the LOD will naturally regenerate from seeds present in the soil and from adjacent areas. No specific revegetation efforts will be applied to these areas; however, these areas will be managed for weeds and additional vegetation controls will be applied if revegetation is not successful in subsequent Interim Monitoring Site Assessments (IMSA).

Modified Grasslands, Modified Pasture and Tame Pasture

Modified grasslands, modified pasture and tame pasture have predominantly exotic species (smooth brome, alfalfa, Kentucky bluegrass) that will likely outcompete any applied native seed mix. Given that the baseline land use of these areas is rangeland for livestock and preparation of hay, an all-purpose forage mix that contains

brome grass, alfalfa, and wheatgrasses (*Agropyron* spp.) would allow quick revegetation and forage value for subsequent grazing in these areas. Commercial all-purpose forage mixes containing smooth brome, wheatgrass, Kentucky bluegrass, alfalfa and timothy could be considered and will require approval from AEPA (Alberta Environment and Protected Areas), the County agrologist and the landowner.

Native forage and grass seed mixes are also available including the Gold Metal Seeds Ltd. (GMSL) EID reclamation mixture (InnoTech 2017) if a preference for native species is identified by AEPA, the County or the landowner. GMSL EID reclamation mixture contains the following species:

- Needle and thread grass (*Hesperostipa comata*)
- June grass (*Koeleria macrantha*)
- Northern wheatgrass (*Agropyron dasystachyum*)
- Western wheatgrass (*Pascopyrum smithii*)
- Blue grama (*Bouteloua gracilis*)
- Slender wheatgrass (*Elymus trachycaulus* ssp. *trachycaulus*)
- Sandberg bluegrass (*Poa secunda*)

Seeding rate of a forage mix will be informed by the commercial mix purchased, the application recommendation from the vendor and the available seeding equipment (e.g., broadcasting seed will require higher seeding rate than a seed drill).

Aspen and mixed forest

Aspen and mixed forest observed in the LOD was a pioneering stand of aspen with an understory of smooth brome. The application of an all-purpose forage mix will provide cover in this area and aspen species will likely regenerate from rootstock in the soil. No planting of aspen stock will be necessary to re-establish aspen cover.

5.2 Regulated Weed and Pest Management

Active control methods will be employed when and where noxious and prohibited noxious species (current inventory provided in Section 3.2.2 and any new observations documented) become established within the Project area and all management will follow the Alberta *Weed Control Act* and *Weed Control Regulations* (GOA 2016; GOA 2022b). Three noxious weeds and one weed species of concern (County of Paintearth 2020) were identified in the LOD during field assessments, and these will be controlled (Section 3.2.2). The use of herbicides, mechanical and biological controls will be implemented to prevent or limit the spread of these weed species and weed management activities will be scheduled. Mechanical means (i.e., mowing before seed set, hand pulling and disposal, grazing by livestock) will be the primary method for weed control, however the application of non-selective herbicides will be considered as permitted by the landowner and municipal requirements. Herbicides will be applied by a qualified applicator in accordance with EPEA pesticide regulations (GOA 2018b).

If applications of herbicides are occurring in and around natural or anthropogenic water bodies (e.g., streams, rivers, lakes, irrigation channels, dugouts, stormwater ponds), then suitable herbicide types, application rates, and areas of coverage will be determined as per the *Environmental Code of Practice for Pesticides* (GOA 2010). Biological controls such as livestock grazing (i.e., sheep and/or goats), combined with an increased stocking

density and adaptive grazing strategy, may be implemented for the suppression of undesirable species (ALP 2013).

Clubroot is a serious soil borne disease of canola and is a regulated pest in Alberta (GOA 2022c). Clubroot has been detected in the County of Paintearth No. 18 but isn't known to be present within the LOD at this time. Consistent with the best practices provided in the Paintearth County Land Use Bylaw No. 698-21, the Invasive Plants in Alberta (GOA 2014a) and the Alberta Clubroot Management Plan (GOA 2014b), all vehicles and equipment will be cleaned, power-washed and disinfected prior to coming to site. This is considered a Level 3 cleaning. Documentation of compliance will be required.

Regulated Weed and Soil Borne Disease Best Management Practices

The following best management practices to limit weed ingress and establishment across the Project during operations and reclamation are adapted from the *Alberta Agricultural Pests Act (2022)*, *Alberta Weed Control Act (GOA 2022b)*, *Conservation and Reclamation Directive for Renewable Energy Operations (AEP 2018a)*, *Revegetation Using Native Plant Materials, Guidelines for Industrial Development Sites (Alberta Environment 2003)*, *Clubroot Management Risk-based Guidance Document (Canadian Energy Pipeline Association 2017 [Paragon 2017])*, and *Native Plant Revegetation Guidelines for Alberta (Native Plant Working Group 2000)*:

- All vehicles and construction equipment will be clean (i.e., free of soils and vegetative debris) and disinfected (and documented) prior to arrival at the Project area and cleaned prior to leaving the Project area. Vehicles and equipment will be regularly visually inspected during working hours and cleaning will occur within a designated area (off site).
- All vehicles and equipment will be physically cleaned to remove soil and crop debris before traversing between fields. Choose low traffic grassy areas near the field exit to complete cleaning when possible. Remove soil and crop debris by knocking or scraping off soil lumps and sweeping loose soil and vegetation from all equipment, vehicles, or tools used during project activities. Compressed air can be used to blow off any residue left on the machinery after scraping. A pressure washer should be used to remove soil and vegetation if the equipment was operated during wet conditions.
- As per AUC Decision 27589-D01-2023, Capital Power shall retain an experienced third-party environmental monitor responsible for mitigation verification, record keeping, and the establishment of the appropriate frequency of monitoring (as needed) to ensure mitigations are being employed and followed at appropriate times. The third-party environmental monitor shall have the authority to halt construction if mitigation measures are not being implemented.
- Documentation of compliance will be required and in consultation with local landowners, will consider additional cleaning measures.
- For risk averse producers or with heavy infestations, additional cleaning steps will be considered.
- Salvaged soil materials will not be moved between different sites.
- Areas that exhibit extensive weed infestations prior to disturbance will have soils salvaged and stockpiled separately to prevent the contamination of larger reclamation soil volumes.
- A certificate of analysis will be provided for native seed lot and will conform to federal seed regulations. Seed mixes will be approved by the municipality and the landowner prior to use.

- Conduct regular inspections of the site during reclamation activities to identify weed species populations early in their establishment and apply suitable controls to manage or eradicate identified weed populations.
- Eradication, removal, and management of prohibited noxious and noxious weeds are obligatory requirements in the Alberta *Weed Control Act and Weed Control Regulation* (GOA 2016; GOA 2022b).

5.3 Rare Plant Management

Rare plant species or ecological communities were not identified in the LOD during the desktop query and field assessments. Based on the dominant habitat types of cultivation and tame pasture in the LOD, the likelihood of occurrence of rare species or ecological communities is low. However, this does not preclude them from being present and any chance finds during construction should be reported with best mitigation practices applied.

Signature Page

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[https://golderassociates.sharepoint.com/sites/140874/project files/6 deliverables/21. soil and vegetation management plan/04. full svmp - rev0 and v12 layout/21452763_capital power_halkirk 2_svmv_rev0.docx](https://golderassociates.sharepoint.com/sites/140874/project%20files/6%20deliverables/21.%20soil%20and%20vegetation%20management%20plan/04.%20full%20svmp%20-%20rev0%20and%20v12%20layout/21452763_capital%20power_halkirk_2_svmv_rev0.docx)

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APPENDIX A

**Pre-Disturbance Site Assessment,
Soil and Vegetation Management Plan Methods**

1.0 PDSA AND SVMP DEVELOPMENT METHODS

1.1 Soil and Terrain Field Data Collection Methods

Soil pre-disturbance site assessments (PDSAs) were completed under nonfrozen ground conditions from August 25 to August 29 and October 3 to October 8. To meet the soil survey density requirements outlined in the C&R Directive for cultivated lands (AEP 2018a), linear and non-linear components of the Project were combined to calculate the total area (ha) of the Limit of Disturbance (LOD) as directed by Alberta Environment and Protected Areas (Personal Communication 2019). In total, 176 site inspections were completed within the LOD. Soil inspection locations are shown on Figure 2 and on operational mapping in Appendix B.

Deep soil inspections were completed to a maximum depth of 120 cm to confirm soil classification from pre-field mapping, to characterize topsoil and upper subsoil depths, to identify potential sensitive soils and soil handling constraints, and to develop soil handling recommendations. Shallow soil inspections were completed only when auger refusal occurred and entailed using a shovel to 50 cm and a Dutch auger to the depth of parent material (or C horizon) at a minimum.

Soils were classified to the subgroup level according to the Canadian System of Soil Classification (Soil Classification Working Group [SCWG] 1998). Soil series were assigned using the Alberta Soils Name File (Generation 4) (Alberta Soil Information Centre [ASIC] 2016). Organic horizons and thickness (L, F, H, and O layers if present) were identified as well as the following properties for each mineral horizon:

- horizon designation
- depth or thickness (cm)
- texture
- coarse fragment content (% volume)
- structure
- consistence
- effervescence
- matrix colour
- mottling (if applicable)
- presence of rooting restriction (if applicable)
- depth of water table (if applicable)
- parent material type
- drainage
- evidence of salinity

Selected terrain attributes were recorded at each site, including landscape slope class (gradient) and surface expression using agricultural regions of Alberta soil inventory database (AGRASID) landscape code conventions (CAESA 2001), slope position, and aspect (if applicable).

Each inspection site was given a unique site number that was recorded in digital data forms. Photographs were taken at each inspection including site-level and ground-level photos of the site, and the deep excavated inspection pit. Field notebooks were maintained to record field-related information that was not included on the data forms.

Daily Review of Plot Data - Field staff reviewed site inspection forms for consistency at each inspection site to confirm required data had been collected. This data was then further reviewed at the end of the field day and then uploaded to WSP's secure SharePoint site.

Final Review of Plot Data – Final review of the plot data for quality assurance and quality control (QA/QC) was done after the field program. Inspections were peer reviewed by a Qualified Professional, as well as by a senior Professional Agrologist.

1.2 Vegetation, Landcover and Wetlands Mapping and Field Data Collection Methods

1.2.1 Vegetation Community, Landcover and Wetland Mapping Methods

Landcover mapping was completed using landcover dataset from 2017 as a preliminary basis for mapping and was updated using relevant field data and imagery (WSP Golder 2022). Landcover constraints were updated through remote mapping to identify and delineate land cover type polygons. The following data sources were used to update landcover mapping:

- 2018, 30 cm Paintearth County No. 18 imagery
- Alberta Biodiversity Monitoring Institute (ABMI) Human Footprint 2018 Version 11 (ABMI 2020)
- Primary Land and Vegetation Inventory (PLVI) v2 (AEP 2020)
- Alberta Merged Wetland Inventory (AEP 2018b)
- AltaLIS 1:20,000 Base Features Hydrography Layer (GOA 2020)

During landcover mapping, a WSP vegetation Ecologist used 1.5 m resolution aerial photography and ArcView Geographic Information Systems (GIS) software to refine and update landcover polygons at a 1:7,500 scale. Landcover polygons were classified into the following categories in the LOD:

- Cultivated (i.e., irrigated, and non-irrigated cropland)
- Developed
- Farmyard
- Modified grassland
- Modified pasture
- Road/trail
- Tame pasture or hay
- Wetlands and waterbodies
- Aspen or mixed forest

Wetlands within the Project Study Area (PSA) were desktop delineated and classified prior to the 2022 field visits. The desktop assessment and mapping of wetlands and water bodies within the PSA followed the directives and guidelines outlined under the Alberta *Wetland Policy* (GOA 2013a), as all wind energy developments in Alberta must follow the regulations set out in the Alberta *Water Act* (GOA 2022a). Wetlands and water bodies were delineated following Pathway 5 (comprehensive desktop delineation with field verification) of the Alberta *Wetland Identification and Delineation Directive* (GOA 2015a). A WSP ecologist delineated individual wetlands and water bodies by using high-quality stereo aerial imagery at a scale of 1:2,500, and interpreted historical imagery obtained from Aerial Photographic Record System and current imagery from ESRI World Imagery (2018).

Wetland class and permanence were assigned following the Alberta Wetland Classification System (AWCS) (GOA 2015b).

1.2.2 Vegetation and Wetlands Field Data Collection Methods

Prior to field assessments, a review of public ecological data sets was conducted (Alberta Conservation Information Management System [ACIMS], Fish and Wildlife Management Information System [FWMIS], Primary Land and Vegetation Inventory [PLVI], Alberta Merged Wetland Inventory [AMWI], Environmentally Significant Areas Report and others) (Fiera 2014; AEP 2018b; ACIMS 2022; AEP 2022).

The desktop and field data were compiled for the Project SVMP and to support various permitting applications. The field data was collected for vegetation, landcover and wetland baseline assessments completed in support of the AUC Rule 007 Application (AUC 2022), wetland assessments completed to support Alberta *Water Act* (GOA 2022a) and Alberta *Wetland Policy* (GOA 2013a) approval applications for the permanently impacted wetlands in the LOD. These various vegetation assessments were completed on September 17, 2021, June 24 to 27, 2022, August 27 to 31, September 1, and September 23 to 25, 2022. These assessments were completed to confirm site-specific vegetation and wetlands conditions within the PSA as defined in the Environmental Evaluation (WSP Golder 2022) and to identify areas with special vegetation management concerns such as weeds, rare plants, rare ecological communities, or native grasslands. Vegetation assessments consisted of four survey types:

- landcover and vegetation field,
- regulated weeds field,
- rare plant and ecological communities, and
- wetlands and water bodies.

The specific data collection methodologies for these four survey types are described in the following sections. The results from the data collection for wetlands and vegetation are provided in Appendix G (dominant species in the LOD), Appendix H (representative landcover photos), Appendix I (list of sensitive species in the Central Parkland Natural Subregion) and Appendix J (representative wetland photos).

1.2.2.1 Landcover and Vegetation Field Surveys

Landcover field assessments were completed in June, August, and September of 2022 concurrently with wetland surveys. The *Conservation and Reclamation Directive for Renewable Energy Operations* was followed for field assessment methodologies (AEP 2018a). The aspen/mixed forest (forested) landcover type requires a minimum of three 10x10 m sample locations. However, the area identified as aspen/mixed forest in the LOD appeared to be an early successional forest post-disturbance and was not large enough in size to accommodate three sample locations. At each land cover field assessment plot, dominant plant species, including any crop species, photographs and GPS waypoints were recorded.

Once field assessments were complete, where applicable, landcover classification and/or mapped land cover boundaries were updated in the office. Vegetation communities and/or landcover were mapped using data collected in the field and extrapolated to non-surveyed areas, where required, based on interpretation of aerial imagery.

1.2.2.2 Regulated Weeds Field Surveys

A search for weed species was completed within the PSA (which encompasses the LOD) concurrently with landcover and wetland field surveys, to determine the occurrence and distribution of plant species listed as ‘noxious’ or ‘prohibited noxious’ in the Alberta *Weed Control Act* and Alberta *Weed Control Regulations* (GOA 2016; GOA 2022b). Populations of non-listed weed species (i.e., species listed as “exotic” by Alberta Conservation Information Management System (ACIMS) [2022]) were also documented as part of various field assessments. The data collected on weed species included species identification, and percent cover.

1.2.2.3 Rare and Listed Plant and Ecological Community Field Surveys

Rare and listed plant and ecological community field assessments were conducted in June and August of 2022 and included systematic random floristic meanders of varying lengths throughout the LOD surveying representative habitats in accordance with Alberta Native Plant Council (ANPC) survey recommendations for rare and listed plants (ANPC 2012). Comprehensive species lists were compiled in the field wherever floristic meanders were completed. These species list were used to help identify ecological communities. In addition, floristic meanders were targeted in any potential rare or listed plant species habitats (e.g., wetlands, forests, etc.), or where historical observations of rare or listed species were recorded (ACIMS 2022).

Rare plant observation data collection included GPS waypoints, digital photographs and plant species lists at all floristic meander locations, and when rare or listed plant species were encountered (defined as tracked/watched by ACIMS [2022] or regulated by SARA/COSEWIC), the approximate area covered the species, the count or an estimate of the number of individual plants, the current vegetative and/or reproductive state of the listed species, and notes on microhabitat of the species occurrence were also recorded. Wetlands and Water Bodies Field Surveys

Prior to field surveys, wetlands and water bodies were interpreted desktop based on historical and recent aerial photography within the PSA in conjunction with a review of local topography, and delineated based on stereo imagery following the Alberta *Wetland Identification and Delineation Directive* (GOA 2015a). Wetland class and permanence were assigned following the Alberta *Wetland Classification System* (AWCS) (GOA 2015b). Supplemental spatial datasets (Alberta Merged Wetland Inventory, Public Land Vegetation Inventory [PLVI], AltaLIS) were reviewed to assist with the interpretation of wetland extend and classification, as needed.

Desktop-delineated wetlands were plotted on field maps, and a wetland and water body field verification survey was carried out by competent WSP Canada wetland biologists in June, August and September of 2022 throughout the PSA. Targeted wetland assessments were completed for wetlands that may be permanently and temporarily impacted by the Project footprint in the LOD to obtain data for the Wetland Assessment and Impact Report (WAIR) and the Wetland Assessment and Impact Form (WAIF) required for Alberta *Water Act* permitting for the Project. These field assessments were completed concurrently with PDSA assessments in 2022.

At each field assessed wetland, the desktop-derived wetland classification was evaluated, and wetland boundaries were updated, where required. Indicator plant species, soil characteristics, presence of weed species and any current wetland impacts associated with human activities were noted where applicable. GPS waypoints, and digital photographs were also recorded at each wetland surveyed.

2.0 DEVELOPMENT OF SOIL AND VEGETATION MANAGEMENT PLAN

2.1 Soil and Terrain

2.1.1 Mapping

Operational mapping for soils within the PSA was completed at a 1:5,000 scale in an orthorectified geographic information system (GIS) to display the extent of soil types, and soil handling recommendations and constraints (AEP 2018a). While the full PSA was mapped, the soil management plan presented in Section 4.0 only describes soils that are anticipated to be affected by Project construction, i.e., within the LOD. Operational mapping is located in Appendix B.

Soil map units (SMUs) are conceptual descriptors used to delineate areas with similar landscape and soil conditions, as well as to spatially represent variations in the type and distribution of soils within a given area (CAESA 2001). SMUs do not necessarily represent one type of soil or soil series. They may contain a combination of soil series with similar handling recommendations and/or inclusions (less than 10%, by area) of dissimilar soil types that are too small in area to be mapped separately based on the map scale.

SMUs were developed based on soil classification, parent material(s), reclamation suitability, horizon depths, drainage, topography, and soil handling recommendations, and named using soil series codes of the dominant soils within each polygon (ASIC 2016). Potential soil handling constraints were assessed for each SMU including excessively fine or coarse texture, salt-affected soils, compaction risk, and water and/or wind erosion risk.

2.1.2 Reclamation Suitability

Reclamation suitability was assessed using physical and chemical parameters collected during the PDSAs, using criteria adapted from the Alberta Soil Advisory Committee in Soil Quality Criteria Relative to Disturbance and Reclamation (AAFRD 1987) (Table 1). Reclamation suitability does not indicate whether a soil type can or cannot be successfully reclaimed, however, it can indicate limiting factors that should be considered during conservation and reclamation planning.

Soil samples were collected from six inspection sites to confirm the presence of salts and/or to confirm the classification of very fine textured soils (soils with clay to heavy clay texture and/or Vertisolic Soils). Approximately 0.5 kg to 1.0 kg of soil was collected from each horizon at the sampled sites and submitted to Bureau Veritas Laboratories in Edmonton, Alberta for analysis. The samples were analyzed for pH, electrical conductivity (EC), sodium adsorption ratio (SAR), saturation (%), and texture. Laboratory results can be found in Appendix F.

Results from field assessments and laboratory data were compared to the criteria in Table 1 and Table 2 each SMU was assigned a reclamation suitability rating. The reclamation suitability rating and the limiting factor(s) were used as the basis for providing soil handling recommendations.

Table 1: Reclamation Suitability Criteria and Ratings for Topsoil

Parameter	Good (G)	Fair (F)	Poor (P)	Unsuitable (U)
Reaction (pH)	6.5 to 7.5	5.5 to 6.4, 7.6 to 8.4	4.5 to 5.4, 8.5 to 9.0	<4.5 and >9.0
Salinity (EC) (dS/m)	<2	2 to 4	4 to 8	>8
Sodicity (SAR)	<4	4 to 8	8 to 12	>12 ^(a)
Saturation (%)	30 to 60	20 to 30, 60 to 80	15 to 20, 80 to 120	<15 and >120
Stoniness Class	S0, S1	S2	S3, S4	S5
Texture ^(d)	fSL, VFSL, L, SL, SiL	CL, SCL, SiCL	S, LS, SiC, C ^(b) , HC ^(c)	-

Source: AAFRD (1987)

(a) SAR 12 to 20 may be poor if texture is SL or coarser, and saturation % is less than 100

(b) C – May be upgraded to fair or good in some arid areas

(c) HC – May be upgraded to fair or good in some arid areas

(d) Texture codes are defined in Appendix C

Table 2: Reclamation Suitability Criteria and Ratings for Subsoil

Parameter	Good (G)	Fair (F)	Poor (P)	Unsuitable (U)
Reaction (pH)	6.5 to 7.5	5.5 to 6.4, 7.6 to 8.4	4.5 to 5.4, 8.5 to 9.0	<4.5 and >9.0
Salinity (EC) (dS/m)	<3	3 to 5	5 to 10	>10
Sodicity (SAR)	<4	4 to 8	8 to 12	>12 ^a
Saturation (%)	30 to 60	20 to 30, 60 to 80	15 to 20, 80 to 120	<15 and >120
Coarse Fragment Content (%)	<3	3 to 25	25 to 60	>50
Texture ^(b)	FSL, VFSL, L, SL, SiL	CL, SCL, SiCL	S, LS, SiC, C, HC	R

Source: AAFRD (1987)

(a) SAR 12 to 20 may be poor if texture is SL or coarser, and saturation % is less than 100

(b) Texture codes are defined in Appendix C

2.1.3 Compaction Risk

Compaction risk is associated with soil physical properties (i.e., texture and coarse fragment content), soil moisture content, and the nature of the applied force. Generally, soils with a higher clay content, and/or a higher moisture content, are more susceptible to soil compaction upon application of a force (Cannon and Landsburg 1990). Compaction risks were assigned to SMUs using criteria adapted from the BC Ministry of Forests (BCMoF 1999) and Archibald et al. (1997) (Table 3).

Table 3: Criteria for Determining Compaction Risk

Drainage	Soil Textural Class ^(a)				
	Fragmental (>70% coarse fragments) and Very Coarse Textures: S, LS	Moderately Coarse Textures: SL, fSL	Medium Textures: SiL, Si, L	Moderately Fine Textures: SCL, CL, SiCL,	Fine and Very Fine Textures: SC, SiC, C, HC
Rapid	Low	Low	Low	Low	Moderate
Well	Low	Low	Low	Moderate	Moderate
Moderately Well	Low	Low	Low	Moderate	Moderate
Imperfect	Low	Low	Moderate	High	High
Poor	Moderate	Moderate	High	High	High
Very Poor (Organics)	Not rated				

Source: Adapted from BC Ministry of Forests (BCMoF 1999) and Archibald et al. (1997)

(a) Textural codes are defined in Appendix C.

2.1.4 Erosion Risk

Soil erosion risk refers to the risk of soil material movement or loss due to erosive forces, typically wind and/or water (i.e., physical loss of soil and/or organic matter). The loss of surface soil by erosion may result in a reduction in soil quality and the ability for soil to support vegetation. Soil erosion may also result in sedimentation in on- or off-site waterbodies and/or wetlands if not effectively mitigated.

Soil erosion risk was assessed for each SMU within the LOD assuming soils have had vegetation removed (i.e., under conditions present during construction). Erosion potential on exposed mineral soil is affected by soil and site characteristics including texture, coarse fragment content, slope gradient, slope length, and slope complexity. High erosion risk does not necessarily correlate with poor quality reclamation suitability, however, soils that are susceptible to erosion may be at an increased risk of soil loss or soil degradation if erosion risk is not mitigated during construction and decommissioning.

2.1.4.1 Water Erosion

Water erosion risk was assessed using methods described by the Transportation Association of Canada (TAC 2005), which uses soil texture (Table 4) combined with slope gradient and slope length (Table 5). In general, water erosion risk is highest in medium-textured soils and increases with higher slope gradient and longer slope length.

Table 4: Criteria for Determining Water Erosion Risk

Soil texture	Water Erosion Risk
Silt, Silt Loam, Loam	High
Sandy Loam, Silty Clay Loam, Sandy Clay Loam, Silty Clay, Clay Loam	Moderate
Sandy Clay, Clay, Heavy Clay, Loamy Sand, Sand	Low

Source: Transportation Association of Canada (2005)

Table 5: Water Erosion Potential

Slope Gradient	Water Erosion Rating ^(a)	Slope Length	
		<70 m	>70 m
0% to 10%	Low	Low	Low
	Moderate	Low	Moderate
	High	Moderate	High
10% to 20%	Low	Low	Moderate
	Moderate	Moderate	High
	High	High	High
>20%	Low	Moderate	Moderate
	Moderate	High	High
	High	High	High

Source: Transportation Association of Canada (2005)

(a) Based on water erosion rating, using soil texture, determined in Table 3: Criteria for Determining Water Erosion Rating

2.1.4.2 Wind Erosion

Wind erosion risk was assessed using topsoil and upper subsoil horizon textures, as described by Coote and Pettapiece (1989) (Table 6). In general, wind erosion risk is highest in coarse textured soils (Coote and Pettapiece 1989), which typically have poor soil structure and limited adhesion of soil particles.

Table 6: Criteria for Determining Wind Erosion Rating

Soil Texture	Wind Erosion Potential
Very Fine Sand, Sand, Coarse Sand, Loamy Sand, Gravelly Sand, Humic (organics)	High
Sandy Loam, Loam, Silt Loam, Sandy Clay Loam, Sandy Clay, Mesic (organics)	Moderate
Silt, Silty Clay Loam, Clay Loam, Silty Clay, Clay, Heavy Clay, Fibric (organics)	Low

Source: Adapted from Coote and Pettapiece (1989)

2.2 Vegetation and Wetlands

The following was taken into consideration to develop the vegetation and wetlands component of the SVMP:

- Establishing vegetation for end-land use:** The PDSA surveys helped to inform vegetation species and classification of landcover types for reclaiming land to baseline conditions. Section 2.2.1 and Table 7 below provides information on the hierarchy for end-land uses, which provides guidance on targeted end-land uses for the LOD to determine suitable seed mixes.
- Management of weeds and clubroot:** The PDSA surveys enabled the identification of non-native species, regulated weeds according to the Alberta *Weed Control Act* and Alberta *Weed Control Regulation* (GOA 2016; GOA 2022b), and weeds of concern by the County of Paintearth (2020) to manage and prevent the spread of weeds from construction. This provided information on species of weed present, and the extent of weed infestation in the LOD to prescribe best management practices. The desktop searches indicated that clubroot is a concern in the LOD, and as such, mitigation practices were proposed, in accordance with the Alberta Clubroot Management Plan (GOA 2014).

2.2.1 Land Use and Constraints

The choice of end land use is limited by a combination of biological, geological and climatic factors that are present on and adjacent to the site based on pre-disturbance conditions. End land use is identified in reclamation planning (including any wetland reclamation) as documented in the *Conservation and Reclamation Plan* (AEP 2018a) with a preference for conservation and reclamation activities that restore pre-disturbance plant communities (Table 7).

Table 7: Hierarchy of Reclamation Outcomes and Preferred Outcomes for Typical Sites

Pre-Disturbance Land Use	Preferred End Land Use	Changed Land Use	Constraint	Regulatory Guidance
Native Grassland	No Area Loss	Upland Forest, Cultivated Land & Tame Pasture, Peatlands & Mineral Wetlands	Ecological Community Constraint	Any change will likely fail the <i>Reclamation Criteria</i> (GOA 2013b)
Cultivated Land & Tame Pasture	Cultivated Land & Tame Pasture	Native Grassland, Upland Forest, Peatlands & Mineral Wetlands	Preferable Siting	<i>C&R Directive</i> (AEP 2018a), <i>Reclamation Criteria</i> (GOA 2013b)
Upland Forest	Upland Forest	Native Grassland, Cultivated Land & Tame Pasture, Peatlands & Mineral Wetlands	Wildlife Habitat Constraint	<i>Wildlife Directive for Alberta Wind Energy Projects</i> (GOA 2018)
Peatlands	No Areal Loss	Native Grassland, Upland Forest, Cultivated Land & Tame Pasture, Mineral Wetlands	Landcover type not present in the local natural subregion	<i>Alberta Wetland Policy</i> (GOA 2013a)
Mineral Wetlands	No Areal Loss	Native Grassland, Upland Forest, Cultivated Land & Tame Pasture, Peatlands	Ecological Community Constraint	<i>Alberta Wetland Policy</i> (GOA 2013a)

Source: Adapted from the Conservation and Reclamation Directive for Renewable Energy Operations (AEP 2018a)

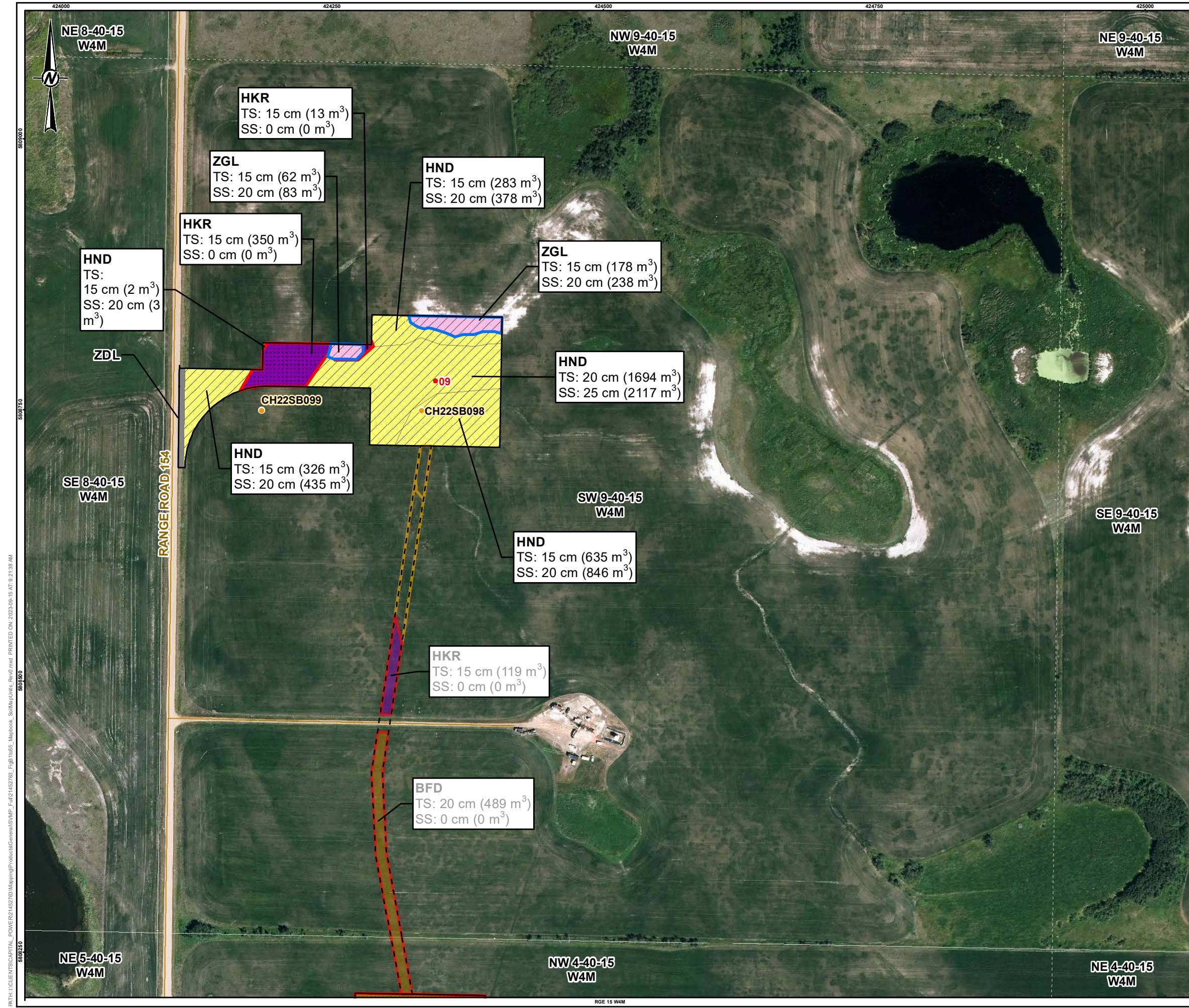
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APPENDIX B

Project Operational Mapping



LEGEND

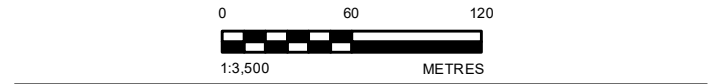
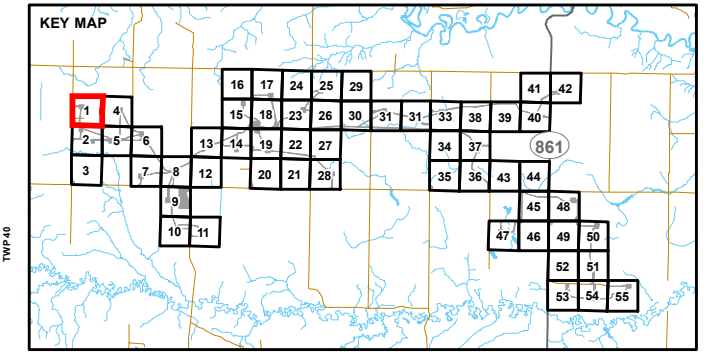
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- TURBINE
- LOCAL ROAD
- FOOTPRINT (WITHOUT CRANE PATH)
- - - UNDERGROUND COLLECTOR SYSTEM
- TS TOPSOIL STRIPPING DEPTH AND VOLUME
- SS SUBSOIL STRIPPING DEPTH AND VOLUME
- TOPSOIL STRIPPING ONLY
- /// TOPSOIL AND SUBSOIL
- SPECIAL STOCKPILING REQUIREMENTS - FOOTPRINT WITHOUT CRANE PATH**
- STOCKPILE WETLAND TOPSOIL AND SUBSOIL SEPARATE FROM NON-WETLAND TOPSOIL AND SUBSOIL¹
- STOCKPILE TOPSOIL SEPARATELY FROM NON-SALT AFFECTED SOIL MAP UNITS²
- SPECIAL SOIL STRIPPING AND WINDROWING REQUIREMENTS - UNDERGROUND COLLECTION SYSTEM**
- STRIP AND WINDROW TOPSOIL ONLY³
- NO SOIL STRIPPING

SOIL MAPPING - FOOTPRINT (WITHOUT CRANE PATH)

- BFD - BROWNFIELD
- HKR - HALKIRK
- HND - HUGHENDEN
- ZDL - DISTURBED LAND
- ZGL - MISCELLANEOUS GLEYSOL

SOIL MAPPING - UNDERGROUND COLLECTION SYSTEM

- BFD - BROWNFIELD
- HKR - HALKIRK



NOTE(S)

1. FOLLOW WETLAND MITIGATION MEASURES AND APPROVAL.
2. ALL POLYGONS WITH THIS SPECIAL STOCKPILING REQUIREMENT ARE PRESUMED TO BE SALT-AFFECTED; TOPSOIL FROM THESE POLYGONS CAN BE STOCKPILED TOGETHER, BUT MUST BE STOCKPILED SEPARATELY FROM POLYGONS WITHOUT THIS SPECIAL STOCKPILING REQUIREMENT.
3. IN CULTIVATED LANDS WHERE SALT-AFFECTED SOILS HAVE BEEN IDENTIFIED, IT IS RECOMMENDED THAT TOPSOIL WILL BE SALVAGED AND WINDROWED PRIOR TO PLOUGHING IN COLLECTOR LINES DURING PERIODS OF FROZEN GROUND CONDITIONS TO AVOID MIXING SALT-AFFECTED UPPER SUBSOIL INTO TOPSOIL.

REFERENCE(S)

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PROJECT
 HALKIRK 2 WIND POWER PROJECT

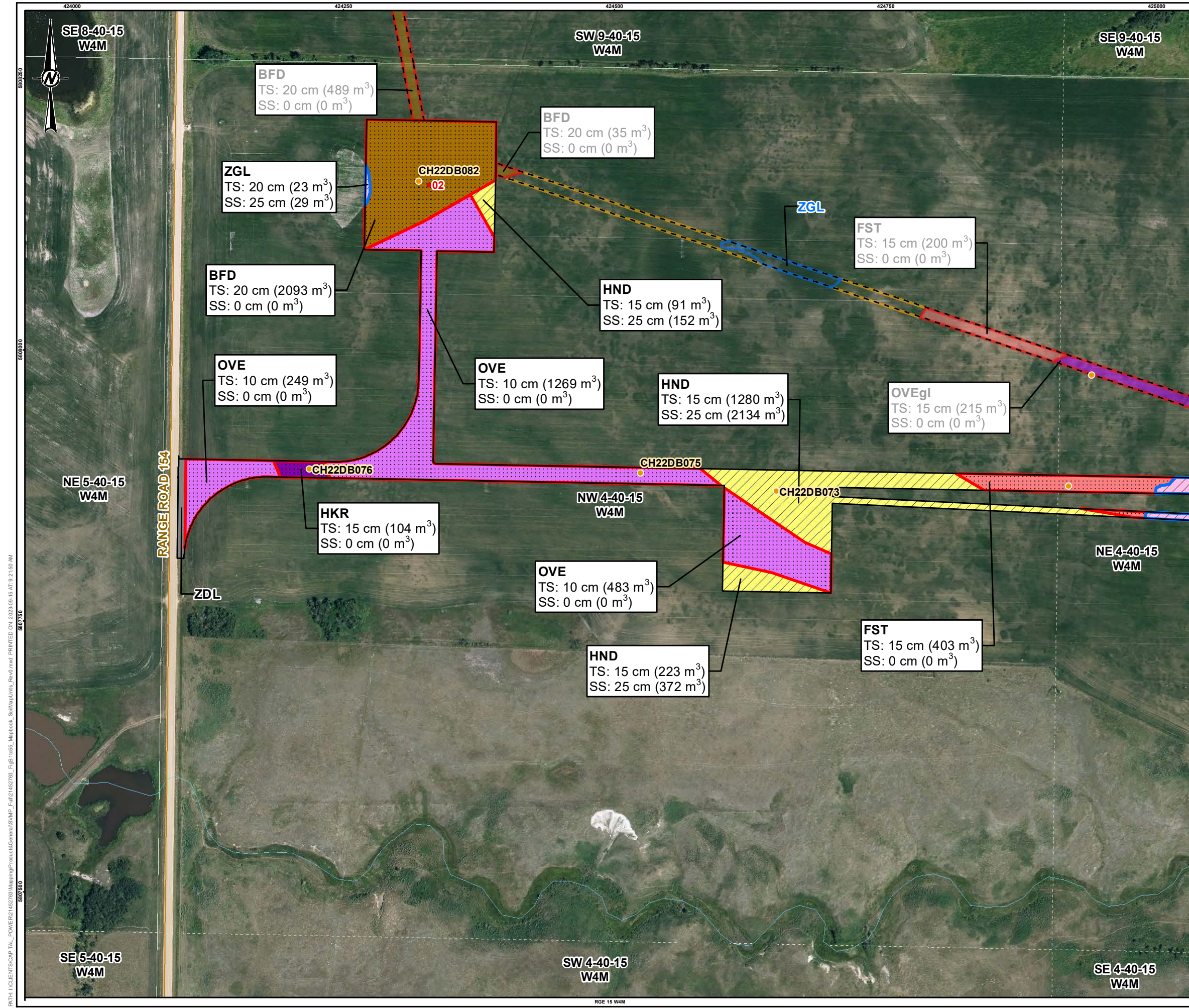
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	APPROVED	SC

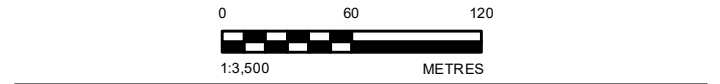
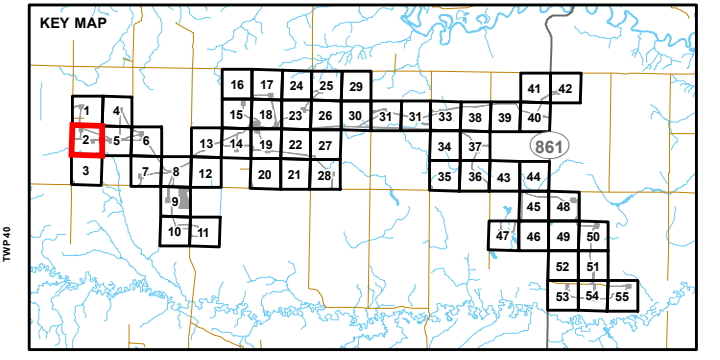
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- LEGEND**
- 2022 SOIL INSPECTION SITE
 - TURBINE
 - LOCAL ROAD
 - WATERCOURSE
- FOOTPRINT BOUNDARY**
- FOOTPRINT (WITHOUT CRANE PATH)
 - UNDERGROUND COLLECTOR SYSTEM
 - TOPSOIL STRIPPING DEPTH AND VOLUME
 - SUBSOIL STRIPPING DEPTH AND VOLUME
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 - STRIP AND WINDROW TOPSOIL ONLY³
 - NO SOIL STRIPPING
- SOIL MAPPING - FOOTPRINT (WITHOUT CRANE PATH)**
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 - OVE - ONNEVUE
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 - ZGL - MISCELLANEOUS GLEYSOL
- SOIL MAPPING - UNDERGROUND COLLECTION SYSTEM**
- BFD - BROWNFIELD
 - FST - FLAGSTAFF
 - OVEgl - GLEYED ONNEVUE



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CLIENT

Capital Power

PROJECT

HALKIRK 2 WIND POWER PROJECT

TITLE

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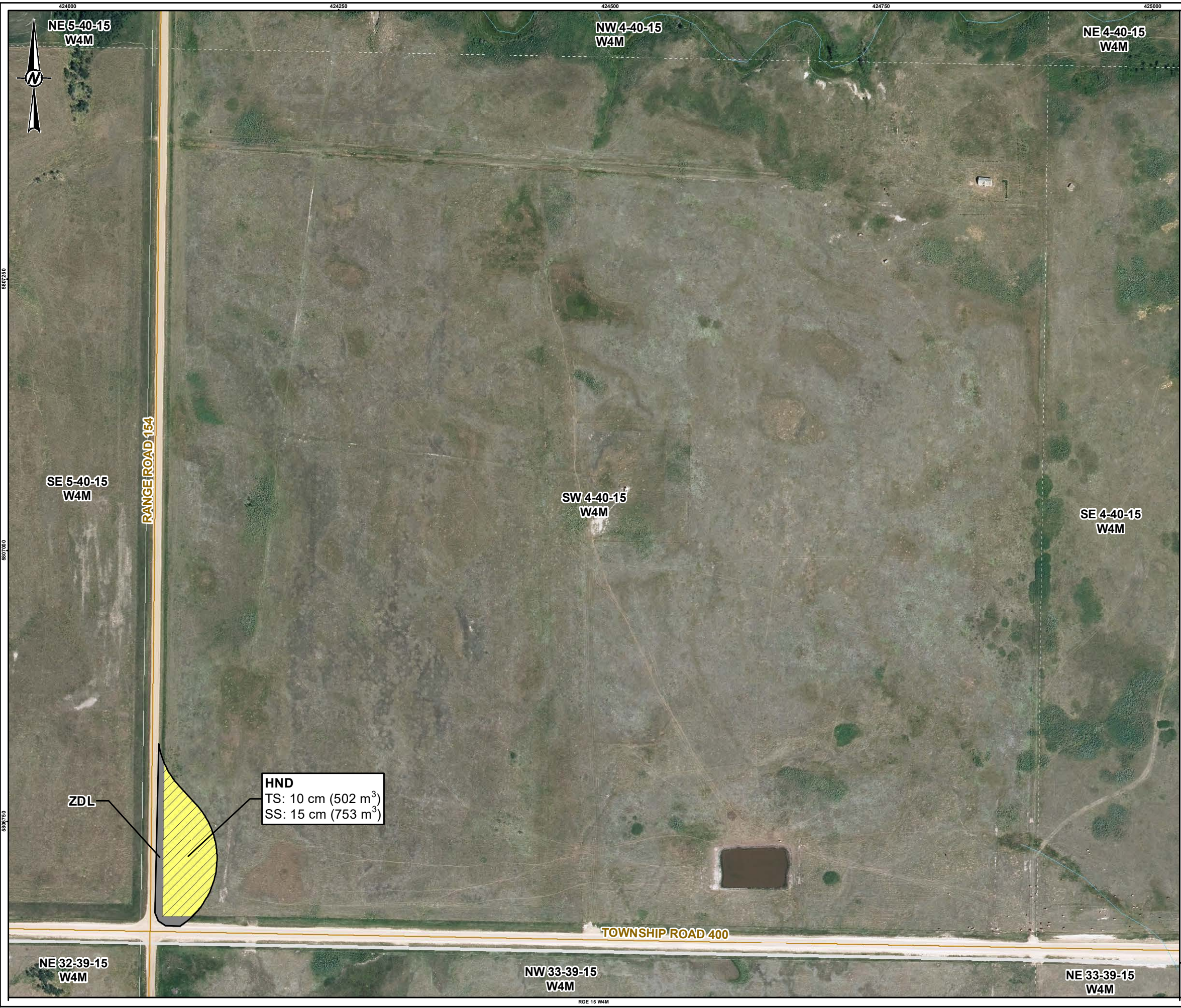
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DESIGNED	2023-09-15
PREPARED	SC
REVIEWED	LB/NB
APPROVED	LS
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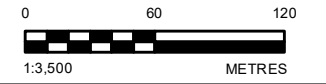
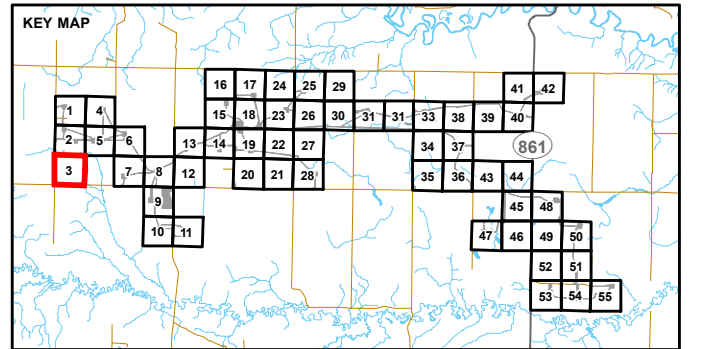
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- LOCAL ROAD
 - WATERCOURSE
 - FOOTPRINT BOUNDARY**
 - FOOTPRINT (WITHOUT CRANE PATH)
 - - - UNDERGROUND COLLECTOR SYSTEM
 - TS** TOPSOIL STRIPPING DEPTH AND VOLUME
 - SS** SUBSOIL STRIPPING DEPTH AND VOLUME
 - /// TOPSOIL AND SUBSOIL
- SOIL MAPPING - FOOTPRINT (WITHOUT CRANE PATH)**
- HND - HUGHENDEN
 - ZDL - DISTURBED LAND



NOTE(S)

1. FOLLOW WETLAND MITIGATION MEASURES AND APPROVAL.
2. ALL POLYGONS WITH THIS SPECIAL STOCKPILING REQUIREMENT ARE PRESUMED TO BE SALT-AFFECTED; TOPSOIL FROM THESE POLYGONS CAN BE STOCKPILED TOGETHER, BUT MUST BE STOCKPILED SEPARATELY FROM POLYGONS WITHOUT THIS SPECIAL STOCKPILING REQUIREMENT.
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PROJECT
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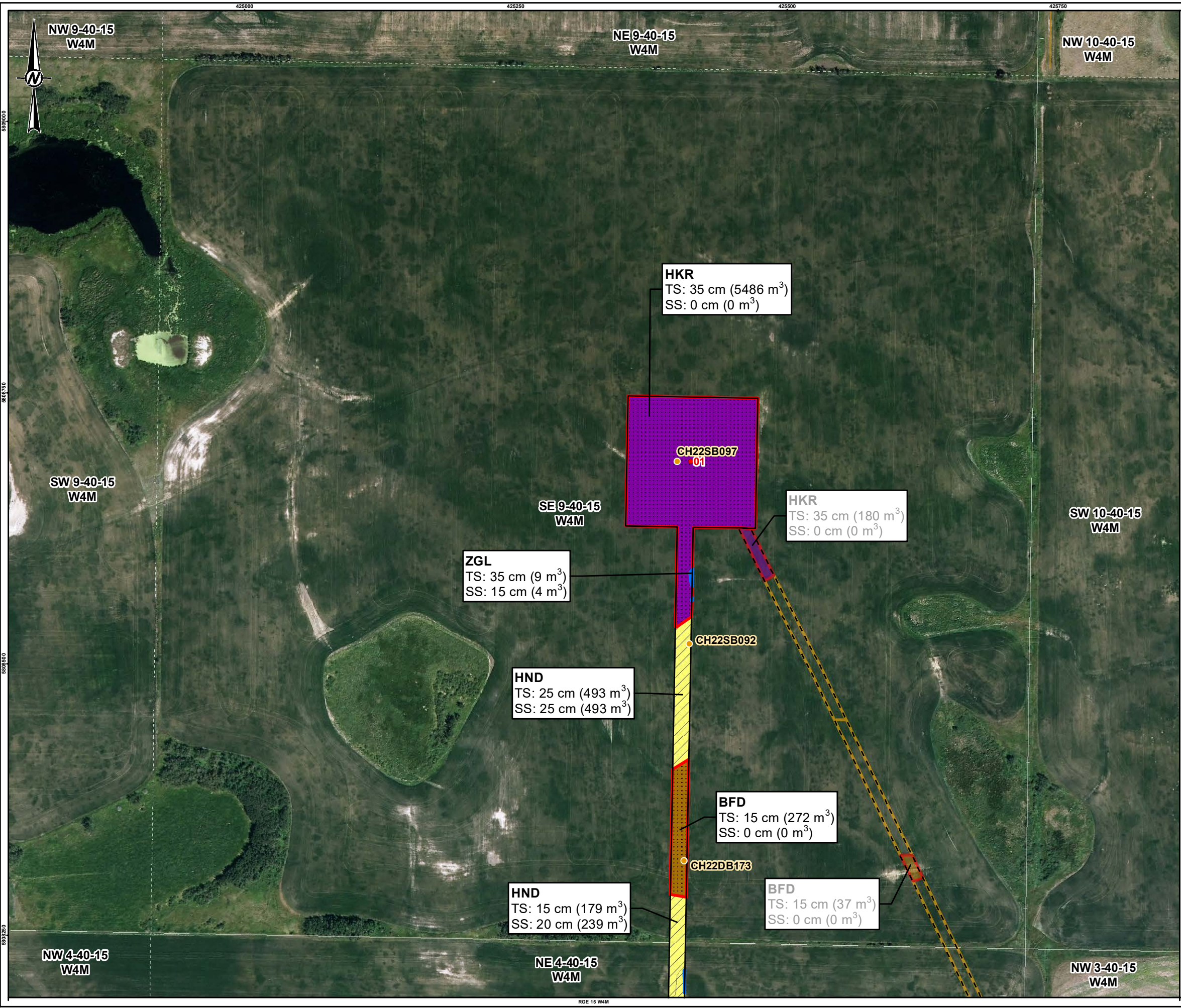
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 SW 4-40-15 W4M

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	PREPARED	LB/NB
	REVIEWED	LS
	APPROVED	SC

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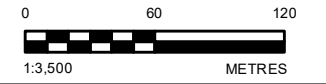
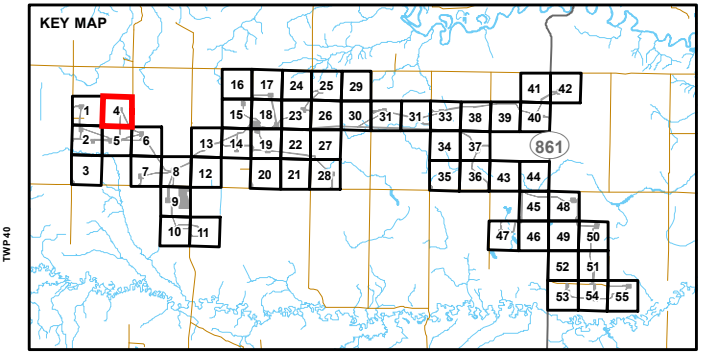
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- TURBINE
- LOCAL ROAD
- FOOTPRINT (WITHOUT CRANE PATH)
- UNDERGROUND COLLECTOR SYSTEM
- TS TOPSOIL STRIPPING DEPTH AND VOLUME
- SS SUBSOIL STRIPPING DEPTH AND VOLUME
- ⋯ TOPSOIL STRIPPING ONLY
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- SPECIAL STOCKPILING REQUIREMENTS - FOOTPRINT WITHOUT CRANE PATH
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- STRIP AND WINDROW TOPSOIL ONLY³
- NO SOIL STRIPPING

SOIL MAPPING - FOOTPRINT (WITHOUT CRANE PATH)

- BFD - BROWNFIELD
- HKR - HALKIRK
- HND - HUGHENDEN
- ZGL - MISCELLANEOUS GLEYSOL

SOIL MAPPING - UNDERGROUND COLLECTION SYSTEM

- BFD - BROWNFIELD
- HKR - HALKIRK



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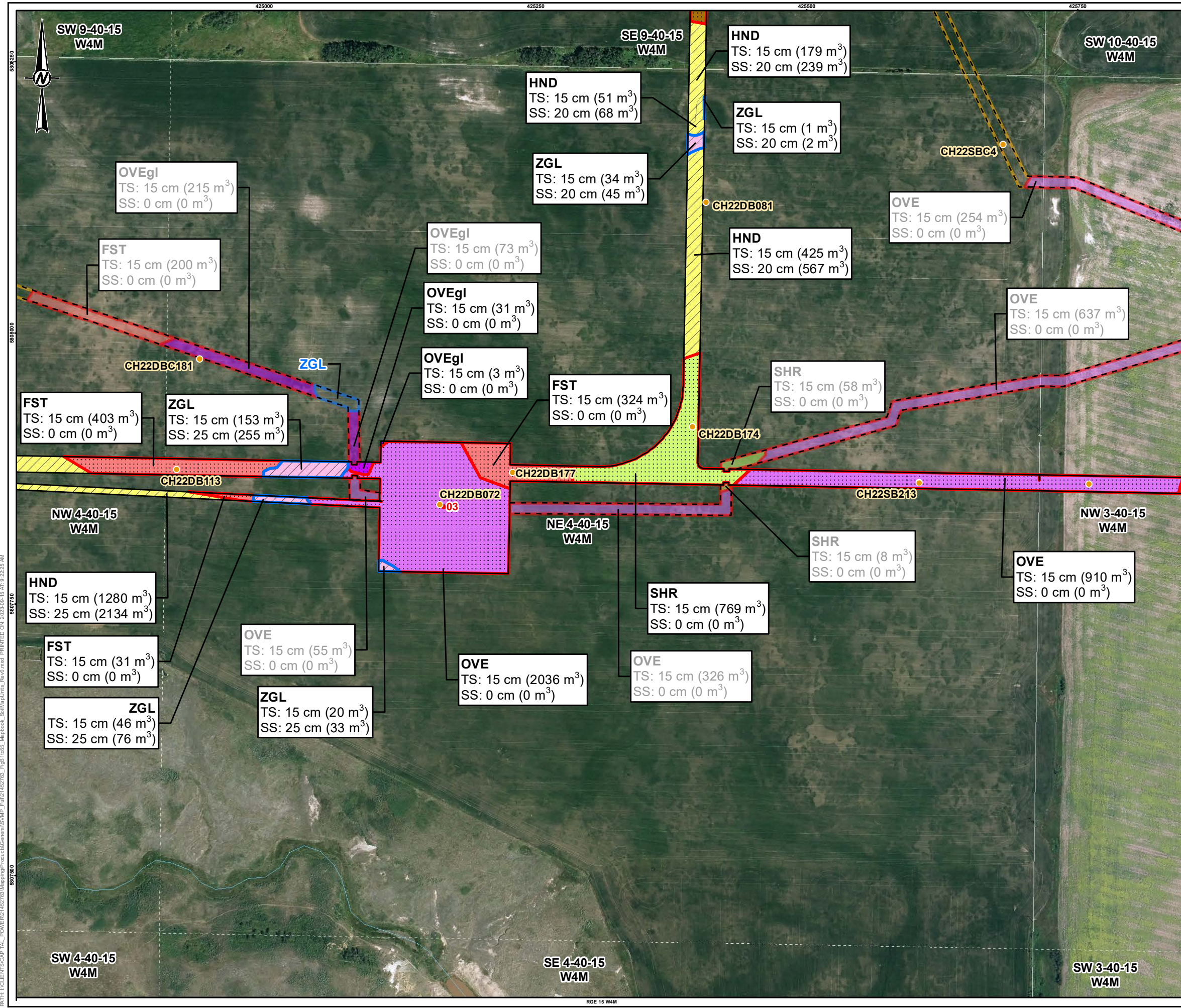
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	REVIEWED	LS
	APPROVED	SC

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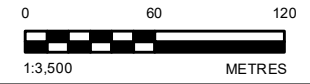
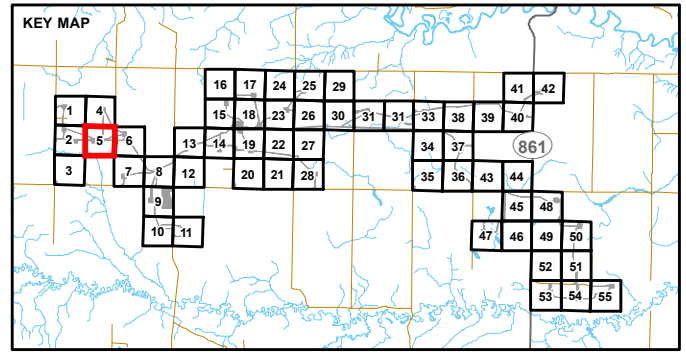
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LEGEND

- 2022 SOIL INSPECTION SITE
- TURBINE
- WATERCOURSE
- FOOTPRINT BOUNDARY
- FOOTPRINT (WITHOUT CRANE PATH)
- UNDERGROUND COLLECTOR SYSTEM
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- SHR - SHEERNESS
- ZGL - MISCELLANEOUS GLEYSOL
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- FST - FLAGSTAFF
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REFERENCE(S)

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 PROJECTION: UTM ZONE 12 DATUM: NAD 83

CLIENT

PROJECT
HALKIRK 2 WIND POWER PROJECT

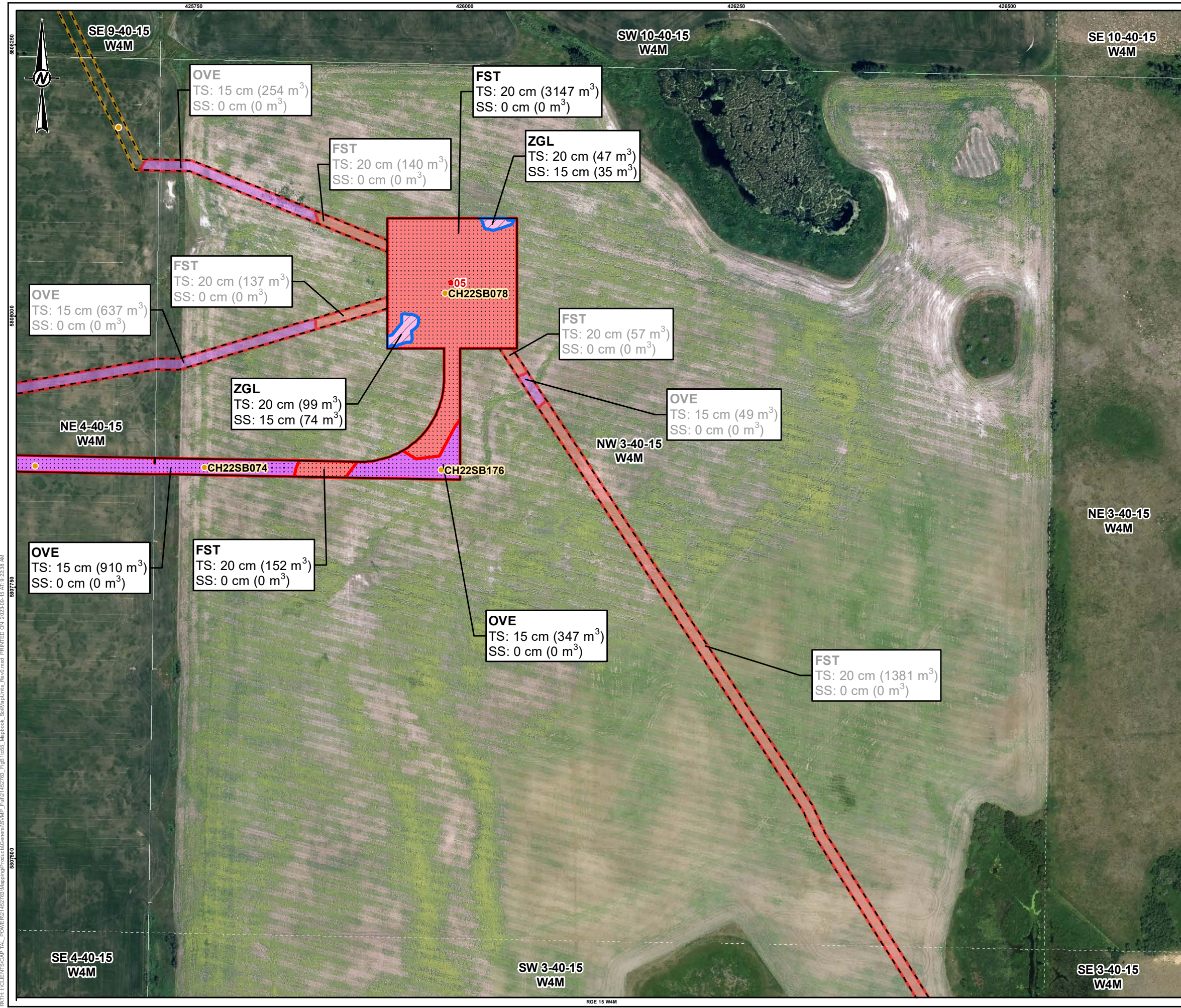
TITLE
**SOIL MAP UNITS WITHIN THE PROJECT FOOTPRINT
NE 4-40-15 W4M**

CONSULTANT	YYYY-MM-DD	2023-09-15
	DESIGNED	SC
	PREPARED	LB/NB
	REVIEWED	LS
	APPROVED	SC

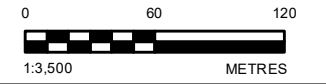
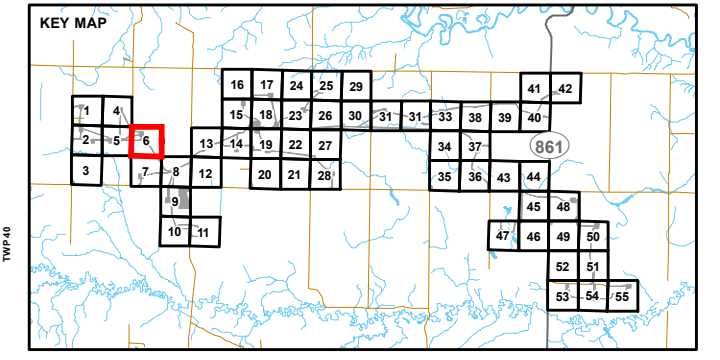
PROJECT NO. CONTROL REV. FIGURE
21452763 0 B-5

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IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B



- LEGEND**
- 2022 SOIL INSPECTION SITE
 - TURBINE
 - FOOTPRINT (WITHOUT CRANE PATH)
 - - - UNDERGROUND COLLECTOR SYSTEM
 - TS TOPSOIL STRIPPING DEPTH AND VOLUME
 - SS SUBSOIL STRIPPING DEPTH AND VOLUME
 - ⋯ TOPSOIL STRIPPING ONLY
 - /// TOPSOIL AND SUBSOIL
- SOIL MAPPING - FOOTPRINT (WITHOUT CRANE PATH)**
- FST - FLAGSTAFF
 - OVE - ONNEVUE
 - ZGL - MISCELLANEOUS GLEYSOL
- SOIL MAPPING - UNDERGROUND COLLECTION SYSTEM**
- FST - FLAGSTAFF
 - OVE - ONNEVUE
- SPECIAL STOCKPILING REQUIREMENTS - FOOTPRINT WITHOUT CRANE PATH**
- STOCKPILE WETLAND TOPSOIL AND SUBSOIL SEPARATE FROM NON-WETLAND TOPSOIL AND SUBSOIL¹
 - STOCKPILE TOPSOIL SEPARATELY FROM NON-SALT AFFECTED SOIL MAP UNITS²
- SPECIAL SOIL STRIPPING AND WINDROWING REQUIREMENTS - UNDERGROUND COLLECTION SYSTEM**
- STRIP AND WINDROW TOPSOIL ONLY³
 - NO SOIL STRIPPING



NOTE(S)

1. FOLLOW WETLAND MITIGATION MEASURES AND APPROVAL.
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 PROJECTION: UTM ZONE 12 DATUM: NAD 83

CLIENT

Capital Power

PROJECT
HALKIRK 2 WIND POWER PROJECT

TITLE
**SOIL MAP UNITS WITHIN THE PROJECT FOOTPRINT
NW 3-40-15 W4M**

CONSULTANT	YYYY-MM-DD	2023-09-15
DESIGNED	SC	
PREPARED	LB/NB	
REVIEWED	LS	
APPROVED	SC	

PROJECT NO. 21452763 CONTROL REV. 0 FIGURE B-6

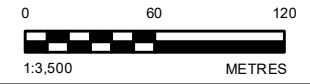
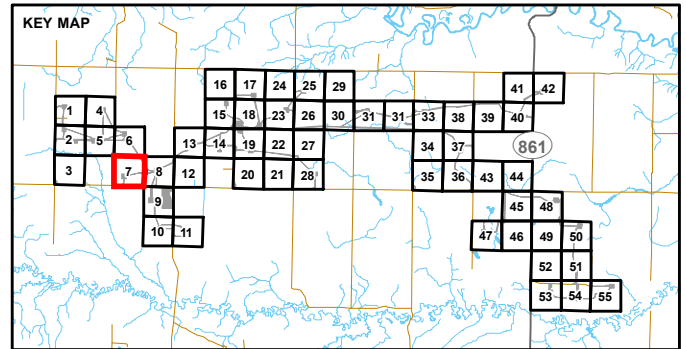
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IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B



- LEGEND**
- 2022 SOIL INSPECTION SITE
 - TURBINE
 - LOCAL ROAD
 - FOOTPRINT (WITHOUT CRANE PATH)
 - - - UNDERGROUND COLLECTOR SYSTEM
 - TS TOPSOIL STRIPPING DEPTH AND VOLUME
 - SS SUBSOIL STRIPPING DEPTH AND VOLUME
 - /// TOPSOIL AND SUBSOIL
 - SPECIAL SOIL STRIPPING AND WINDROWING REQUIREMENTS - UNDERGROUND COLLECTION SYSTEM
 - NO SOIL STRIPPING - FOLLOW WETLAND MITIGATION MEASURES AND APPROVAL
 - STRIP AND WINDROW TOPSOIL ONLY
 - NO SOIL STRIPPING
- SOIL MAPPING - FOOTPRINT (WITHOUT CRANE PATH)**
- HND - HUGHENDEN
 - ZDL - DISTURBED LAND
- SOIL MAPPING - UNDERGROUND COLLECTION SYSTEM**
- BFD - BROWNFIELD
 - FST - FLAGSTAFF
 - OVE - ONNEVUE



NOTE(S)

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PROJECTION: UTM ZONE 12 DATUM: NAD 83

CLIENT

Capital Power

PROJECT
HALKIRK 2 WIND POWER PROJECT

TITLE
**SOIL MAP UNITS WITHIN THE PROJECT FOOTPRINT
SW 3-40-15 W4M**

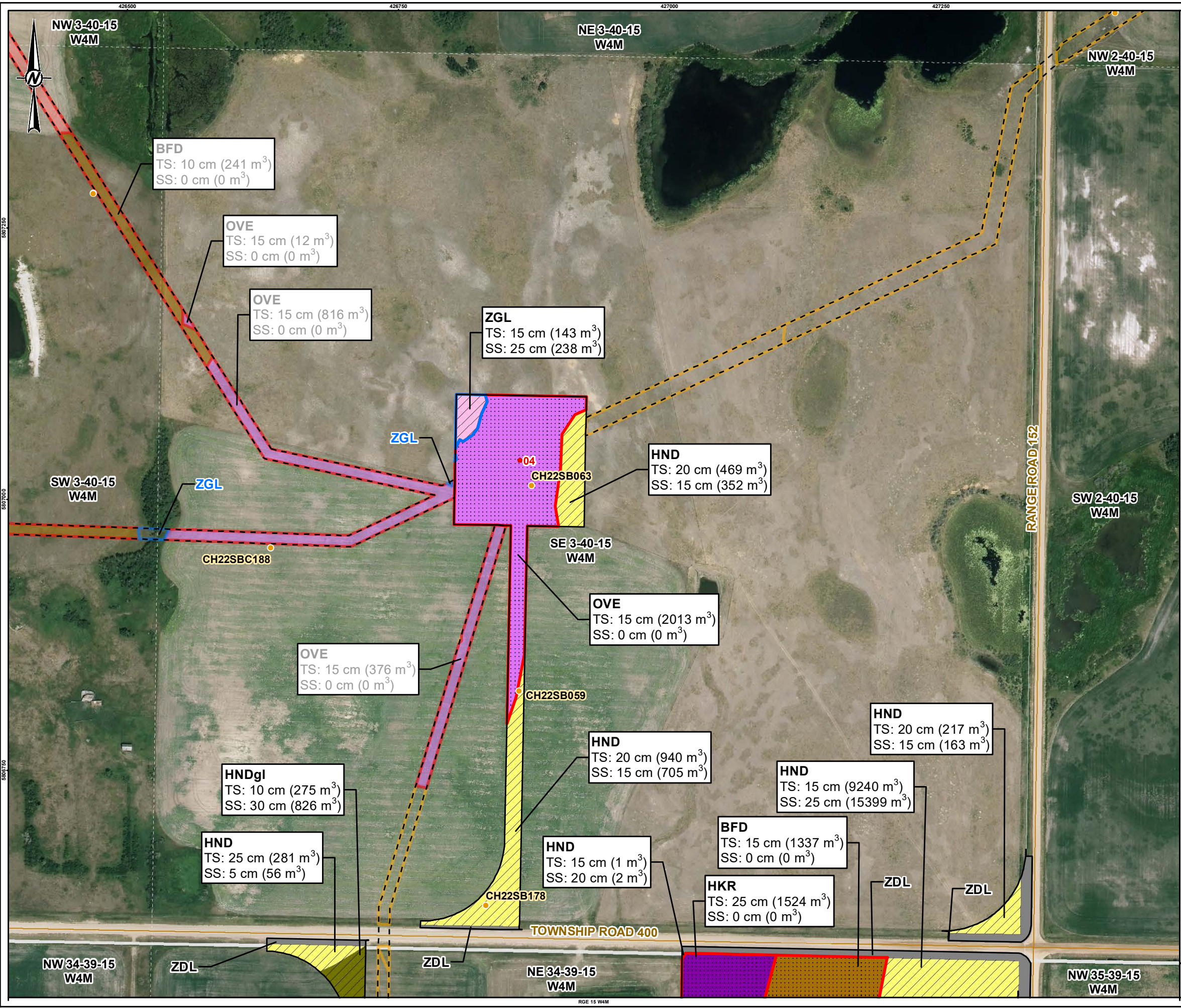
CONSULTANT

YYYY-MM-DD	2023-09-15
DESIGNED	SC
PREPARED	LB/NB
REVIEWED	LS
APPROVED	SC

PROJECT NO. CONTROL REV. FIGURE
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LEGEND

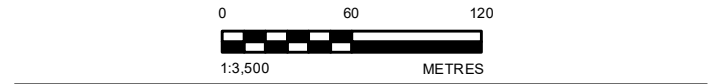
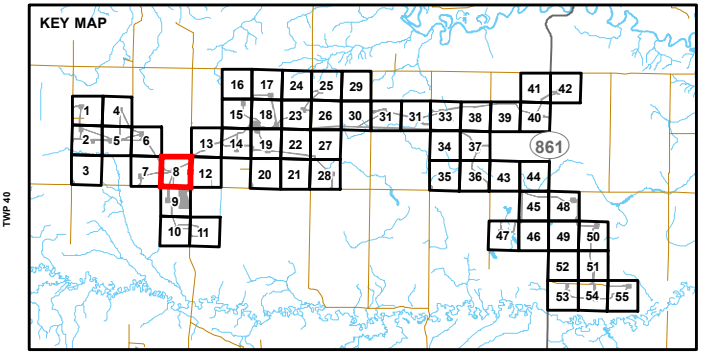
- 2022 SOIL INSPECTION SITE
- TURBINE
- LOCAL ROAD
- FOOTPRINT (WITHOUT CRANE PATH)
- - - UNDERGROUND COLLECTOR SYSTEM
- TS TOPSOIL STRIPPING DEPTH AND VOLUME
- SS SUBSOIL STRIPPING DEPTH AND VOLUME
- ⋯ TOPSOIL STRIPPING ONLY
- /// TOPSOIL AND SUBSOIL
- SPECIAL STOCKPILING REQUIREMENTS - FOOTPRINT WITHOUT CRANE PATH**
- STOCKPILE WETLAND TOPSOIL AND SUBSOIL SEPARATE FROM NON-WETLAND TOPSOIL AND SUBSOIL¹
- STOCKPILE TOPSOIL SEPARATELY FROM NON-SALT AFFECTED SOIL MAP UNITS²
- SPECIAL SOIL STRIPPING AND WINDROWING REQUIREMENTS - UNDERGROUND COLLECTION SYSTEM**
- NO SOIL STRIPPING - FOLLOW WETLAND MITIGATION MEASURES AND APPROVAL
- STRIP AND WINDROW TOPSOIL ONLY³
- NO SOIL STRIPPING

SOIL MAPPING - FOOTPRINT (WITHOUT CRANE PATH)

- BFD - BROWNFIELD
- HKR - HALKIRK
- HND - HUGHENDEN
- HNDgl - HUGHENDEN-GLEYED
- OVE - ONNEVUE
- ZDL - DISTURBED LAND
- ZGL - MISCELLANEOUS GLEYSOL

SOIL MAPPING - UNDERGROUND COLLECTION SYSTEM

- BFD - BROWNFIELD
- FST - FLAGSTAFF
- OVE - ONNEVUE



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 PROJECTION: UTM ZONE 12 DATUM: NAD 83

CLIENT

Capital Power

PROJECT
 HALKIRK 2 WIND POWER PROJECT

TITLE
**SOIL MAP UNITS WITHIN THE PROJECT FOOTPRINT
 SE 3-40-15 W4M**

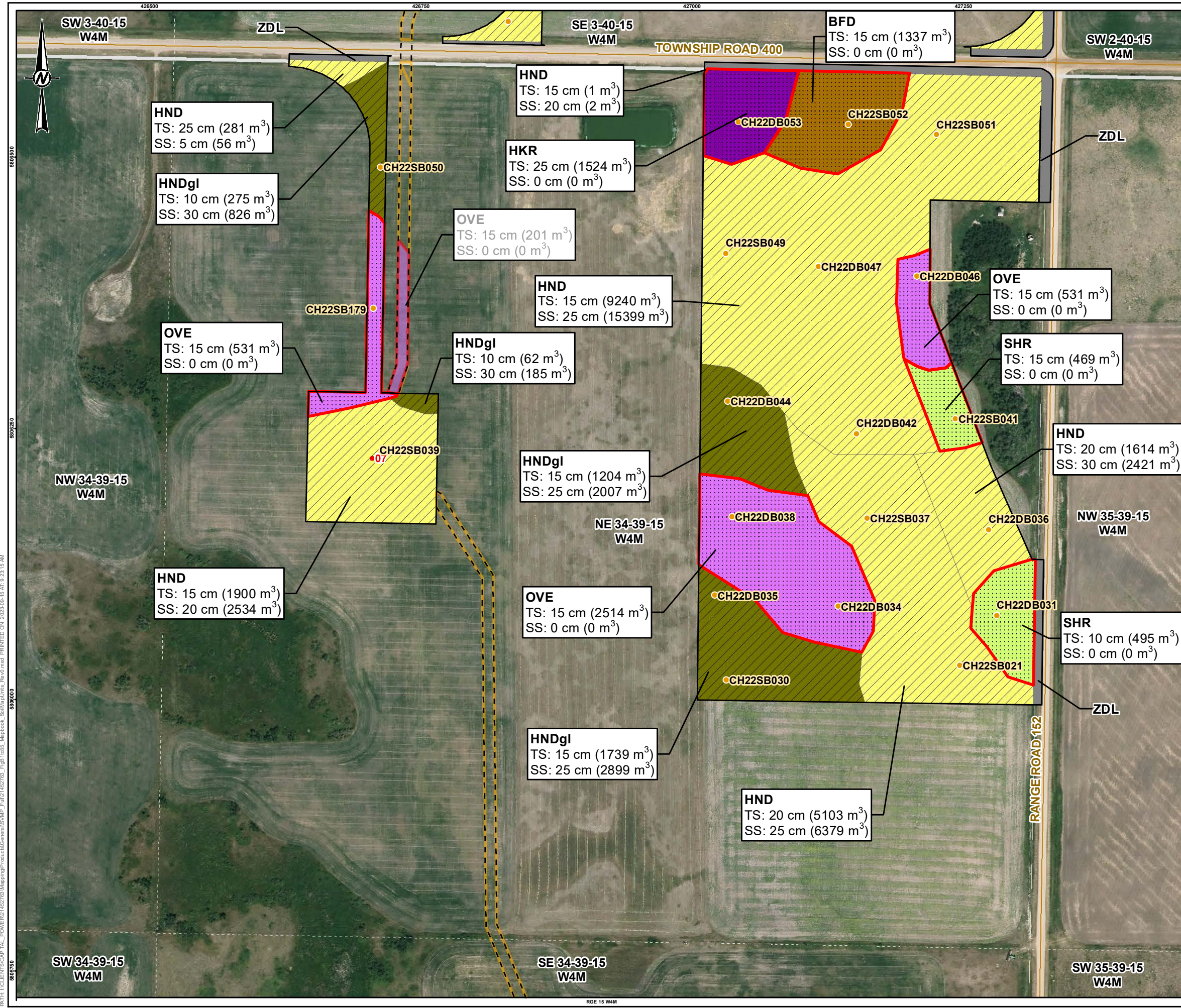
CONSULTANT

YYYY-MM-DD	2023-09-15
DESIGNED	SC
PREPARED	LB/NB
REVIEWED	LS
APPROVED	SC

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IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B
 25mm



LEGEND

- 2022 SOIL INSPECTION SITE
- TURBINE
- LOCAL ROAD
- FOOTPRINT BOUNDARY
- FOOTPRINT (WITHOUT CRANE PATH)
- - - UNDERGROUND COLLECTOR SYSTEM
- TS TOPSOIL STRIPPING DEPTH AND VOLUME
- SS SUBSOIL STRIPPING DEPTH AND VOLUME
- TOPSOIL STRIPPING ONLY
- //// TOPSOIL AND SUBSOIL

SOIL MAPPING - FOOTPRINT (WITHOUT CRANE PATH)

- BFD - BROWNFIELD
- HKR - HALKIRK
- HND - HUGHENDEN
- HNDgl - HUGHENDEN-GLEYED
- OVE - ONNEVUE
- SHR - SHEERNESS
- ZDL - DISTURBED LAND

SOIL MAPPING - UNDERGROUND COLLECTION SYSTEM

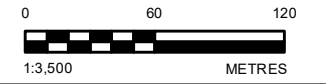
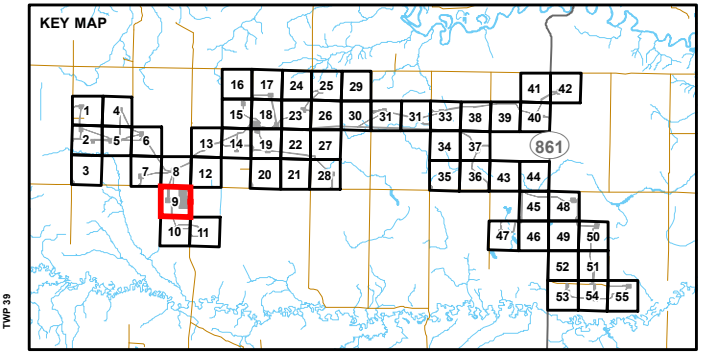
- OVE - ONNEVUE

SPECIAL STOCKPILING REQUIREMENTS - FOOTPRINT WITHOUT CRANE PATH

- STOCKPILE TOPSOIL SEPARATELY FROM NON-SALT AFFECTED SOIL MAP UNITS²

SPECIAL SOIL STRIPPING AND WINDROWING REQUIREMENTS - UNDERGROUND COLLECTION SYSTEM

- STRIP AND WINDROW TOPSOIL ONLY³
- NO SOIL STRIPPING



NOTE(S)

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 PROJECTION: UTM ZONE 12 DATUM: NAD 83

CLIENT

Capital Power

PROJECT
 HALKIRK 2 WIND POWER PROJECT

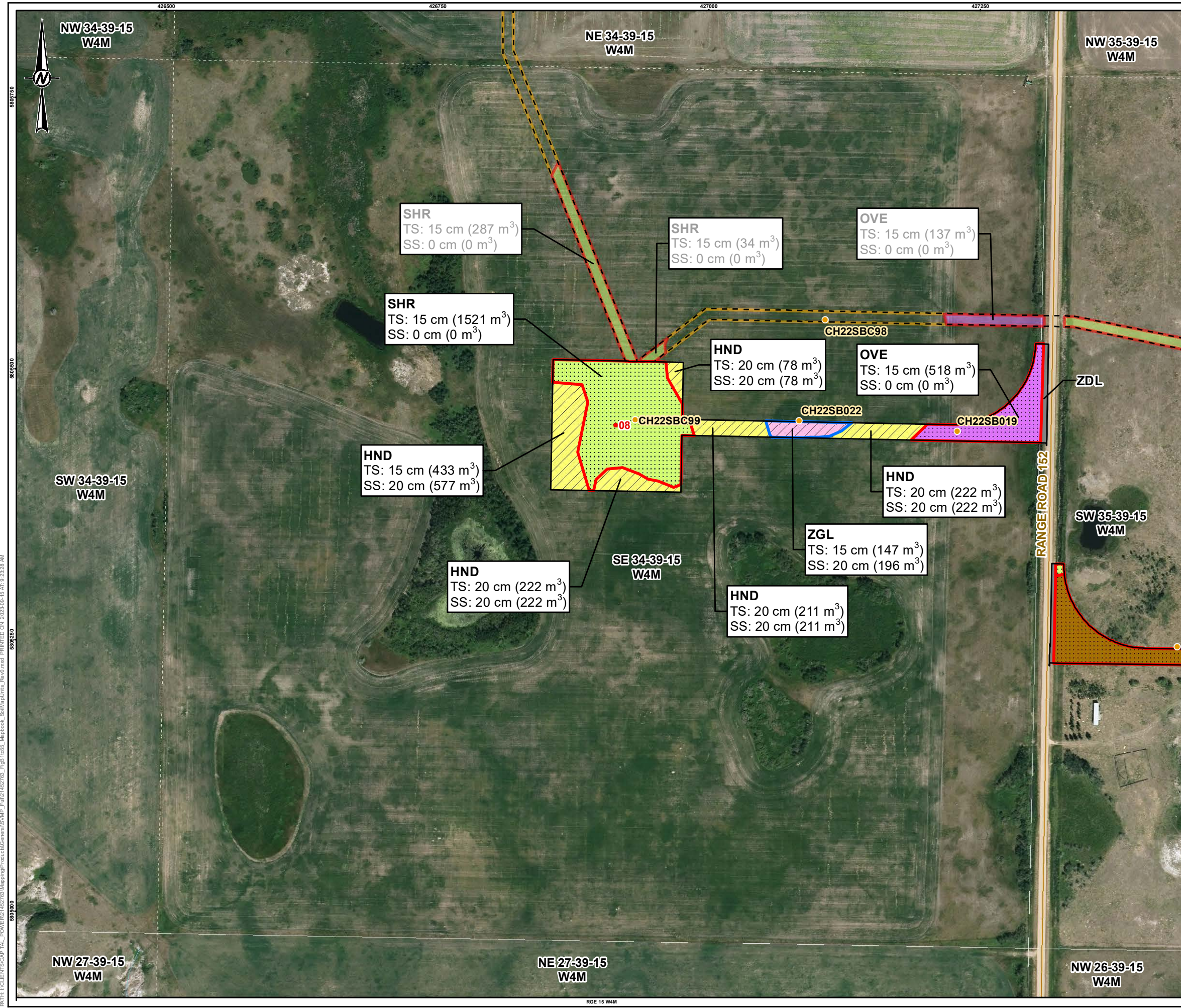
TITLE
**SOIL MAP UNITS WITHIN THE PROJECT FOOTPRINT
 NE 34-39-15 W4M**

CONSULTANT	YYYY-MM-DD	2023-09-15
DESIGNED	SC	
PREPARED	LB/NB	
REVIEWED	LS	
APPROVED	SC	

PROJECT NO. CONTROL REV. FIGURE
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IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B
 25mm



LEGEND

- 2022 SOIL INSPECTION SITE
- TURBINE
- LOCAL ROAD
- WATERCOURSE

FOOTPRINT BOUNDARY

- FOOTPRINT (WITHOUT CRANE PATH)
- - - UNDERGROUND COLLECTOR SYSTEM

TS TOPSOIL STRIPPING DEPTH AND VOLUME

SS SUBSOIL STRIPPING DEPTH AND VOLUME

- TOPSOIL STRIPPING
- /// TOPSOIL AND SUBSOIL

SPECIAL STOCKPILING REQUIREMENTS - FOOTPRINT WITHOUT CRANE PATH

- STOCKPILE WETLAND TOPSOIL AND SUBSOIL SEPARATE FROM NON-WETLAND TOPSOIL AND SUBSOIL¹
- STOCKPILE TOPSOIL SEPARATELY FROM NON-SALT AFFECTED SOIL MAP UNITS²

SPECIAL SOIL STRIPPING AND WINDROWING REQUIREMENTS - UNDERGROUND COLLECTION SYSTEM

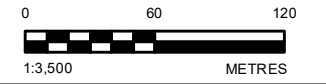
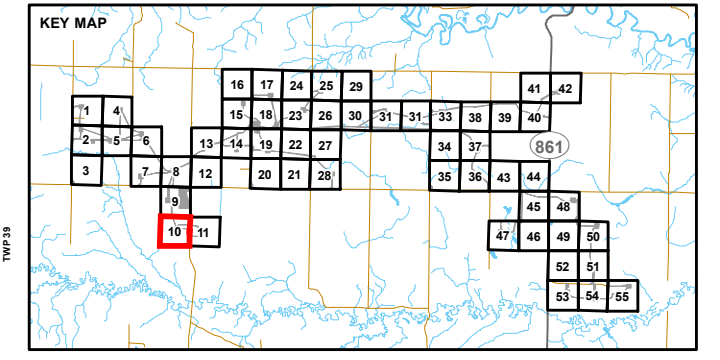
- STRIP AND WINDROW TOPSOIL ONLY³
- NO SOIL STRIPPING

SOIL MAPPING - FOOTPRINT (WITHOUT CRANE PATH)

- BFD - BROWNFIELD
- HND - HUGHENDEN
- OVE - ONNEVUE
- SHR - SHEERNESS
- ZDL - DISTURBED LAND
- ZGL - MISCELLANEOUS GLEYSOL

SOIL MAPPING - UNDERGROUND COLLECTION SYSTEM

- OVE - ONNEVUE
- SHR - SHEERNESS



NOTE(S)

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PROJECTION: UTM ZONE 12 DATUM: NAD 83

CLIENT

Capital Power

PROJECT
HALKIRK 2 WIND POWER PROJECT

TITLE
**SOIL MAP UNITS WITHIN THE PROJECT FOOTPRINT
SE 34-39-15 W4M**

CONSULTANT

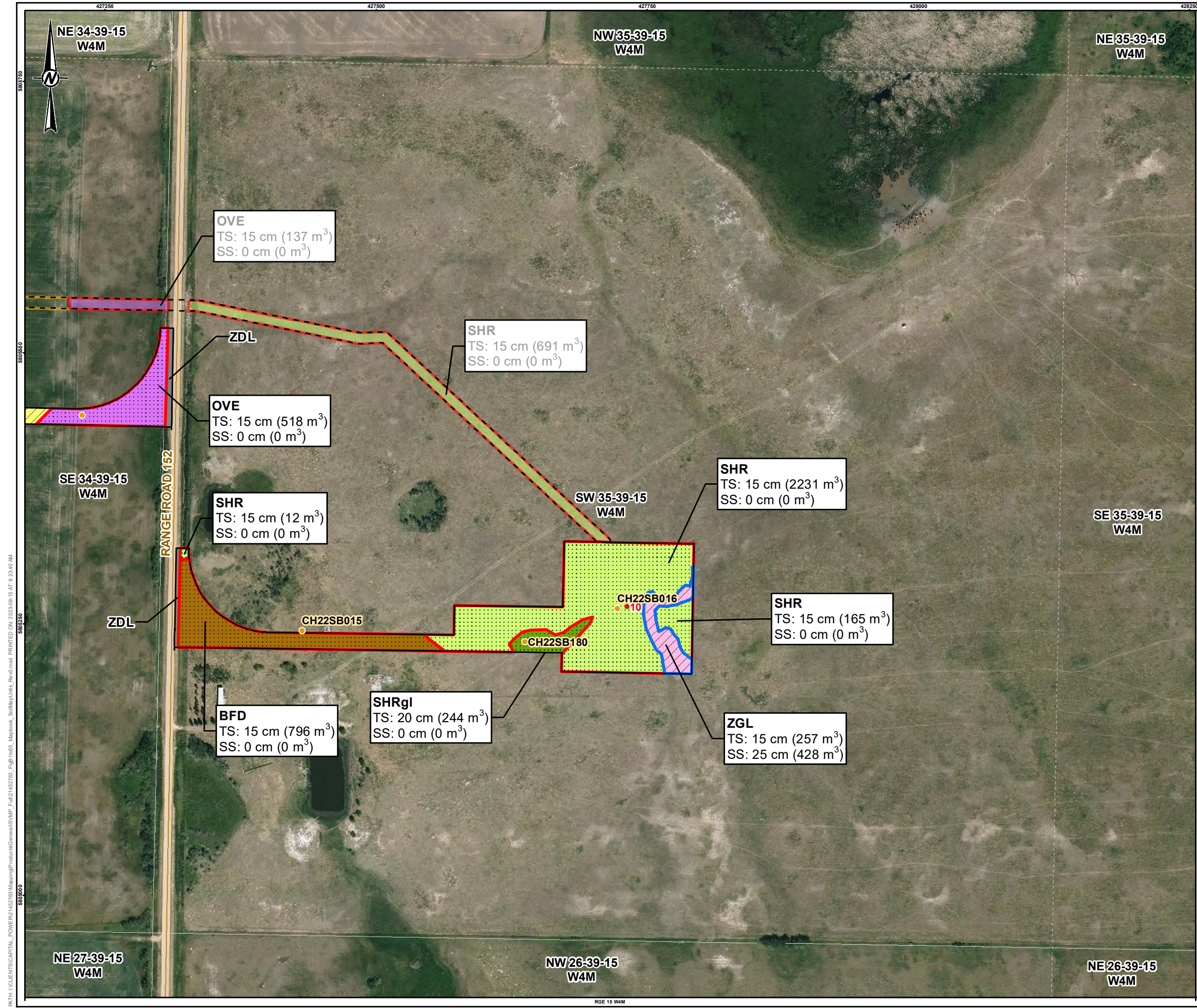
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PROJECT NO. CONTROL REV. FIGURE

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LEGEND

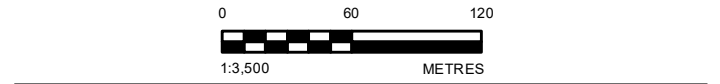
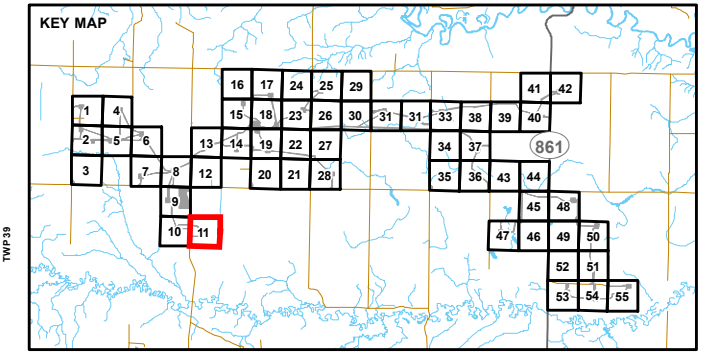
- 2022 SOIL INSPECTION SITE
- TURBINE
- LOCAL ROAD
- FOOTPRINT (WITHOUT CRANE PATH)
- UNDERGROUND COLLECTOR SYSTEM
- TS TOPSOIL STRIPPING DEPTH AND VOLUME
- SS SUBSOIL STRIPPING DEPTH AND VOLUME
- TOPSOIL STRIPPING ONLY
- TOPSOIL AND SUBSOIL
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- STOCKPILE WETLAND TOPSOIL AND SUBSOIL SEPARATE FROM NON-WETLAND TOPSOIL AND SUBSOIL¹
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- SPECIAL SOIL STRIPPING AND WINDROWING REQUIREMENTS - UNDERGROUND COLLECTION SYSTEM
- STRIP AND WINDROW TOPSOIL ONLY³
- NO SOIL STRIPPING

SOIL MAPPING - FOOTPRINT (WITHOUT CRANE PATH)

- BFD - BROWNFIELD
- HND - HUGHENDEN
- OVE - ONNEVUE
- SHR - SHEERNESS
- SHRgl - SHEERNESS - GLEYED
- ZDL - DISTURBED LAND
- ZGL - MISCELLANEOUS GLEYSOL

SOIL MAPPING - UNDERGROUND COLLECTION SYSTEM

- OVE - ONNEVUE
- SHR - SHEERNESS



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PROJECTION: UTM ZONE 12 DATUM: NAD 83

CLIENT

Capital Power

PROJECT
HALKIRK 2 WIND POWER PROJECT

TITLE
**SOIL MAP UNITS WITHIN THE PROJECT FOOTPRINT
SW 35-39-15 W4M**

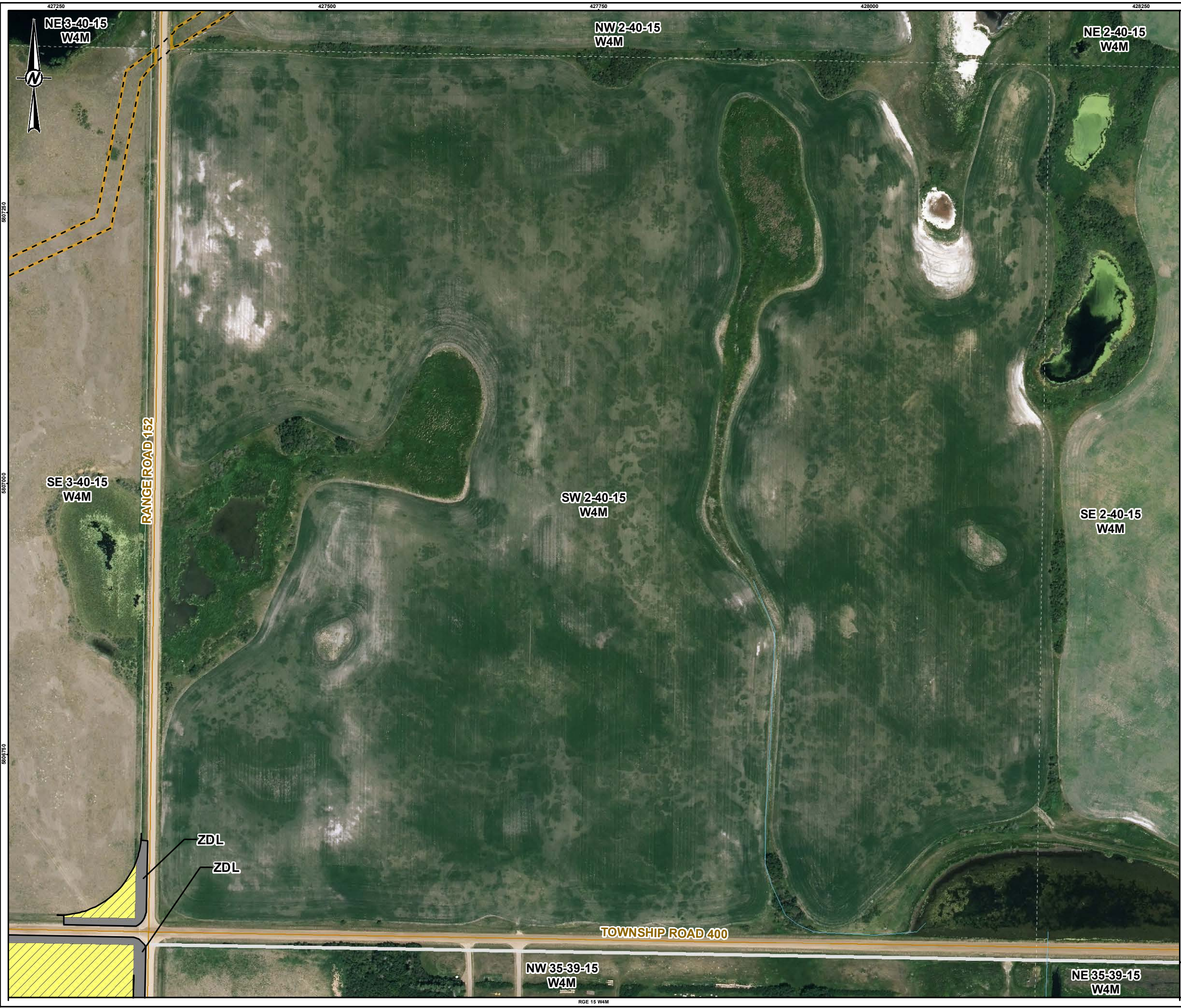
CONSULTANT

YYYY-MM-DD	2023-09-15
DESIGNED	SC
PREPARED	LB/NB
REVIEWED	LS
APPROVED	SC

PROJECT NO. 21452763 CONTROL REV. 0 FIGURE B-11

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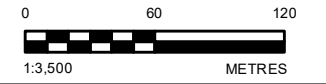
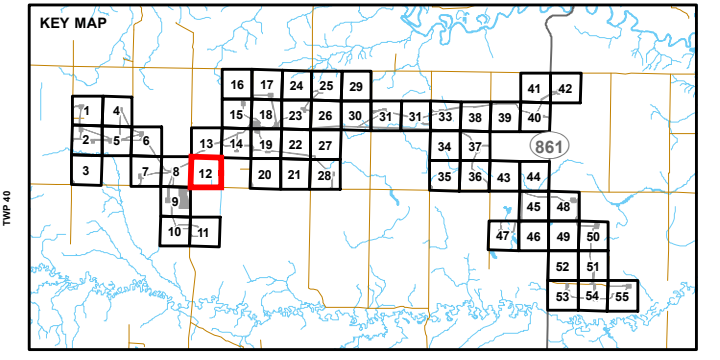


LEGEND

- LOCAL ROAD
- WATERCOURSE
- FOOTPRINT BOUNDARY
- FOOTPRINT (WITHOUT CRANE PATH)
- UNDERGROUND COLLECTOR SYSTEM
- TS TOPSOIL STRIPPING DEPTH AND VOLUME
- SS SUBSOIL STRIPPING DEPTH AND VOLUME
- TOPSOIL AND SUBSOIL
- SPECIAL SOIL STRIPPING AND WINDROWING REQUIREMENTS - UNDERGROUND COLLECTION SYSTEM
- NO SOIL STRIPPING

SOIL MAPPING - FOOTPRINT (WITHOUT CRANE PATH)

- HND - HUGHENDEN
- ZDL - DISTURBED LAND



NOTE(S)

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REFERENCE(S)

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 PROJECTION: UTM ZONE 12 DATUM: NAD 83

CLIENT

Capital Power

PROJECT

HALKIRK 2 WIND POWER PROJECT

TITLE

**SOIL MAP UNITS WITHIN THE PROJECT FOOTPRINT
SW 2-40-15 W4M**

CONSULTANT	YYYY-MM-DD	2023-09-15
DESIGNED	SC	
PREPARED	LB/NB	
REVIEWED	LS	
APPROVED	SC	

PROJECT NO. CONTROL REV. FIGURE

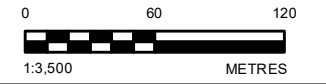
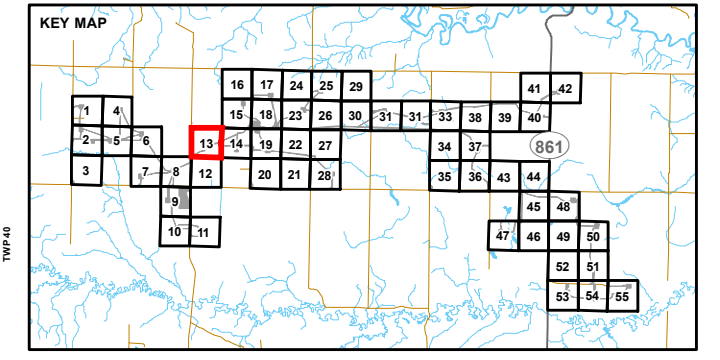
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IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B



- LEGEND**
- 2022 SOIL INSPECTION SITE
 - LOCAL ROAD
 - FOOTPRINT BOUNDARY
 - FOOTPRINT (WITHOUT CRANE PATH)
 - - - UNDERGROUND COLLECTOR SYSTEM
 - TS TOPSOIL STRIPPING DEPTH AND VOLUME
 - SS SUBSOIL STRIPPING DEPTH AND VOLUME
 - SPECIAL SOIL STRIPPING AND WINDROWING REQUIREMENTS - UNDERGROUND COLLECTION SYSTEM
 - STRIP AND WINDROW TOPSOIL ONLY³
 - NO SOIL STRIPPING
 - SOIL MAPPING - UNDERGROUND COLLECTION SYSTEM
 - BFD - BROWNFIELD
 - FST - FLAGSTAFF
 - SHR - SHEERNESS



- NOTE(S)**
1. FOLLOW WETLAND MITIGATION MEASURES AND APPROVAL.
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 PROJECTION: UTM ZONE 12 DATUM: NAD 83

CLIENT
Capital Power

PROJECT
 HALKIRK 2 WIND POWER PROJECT

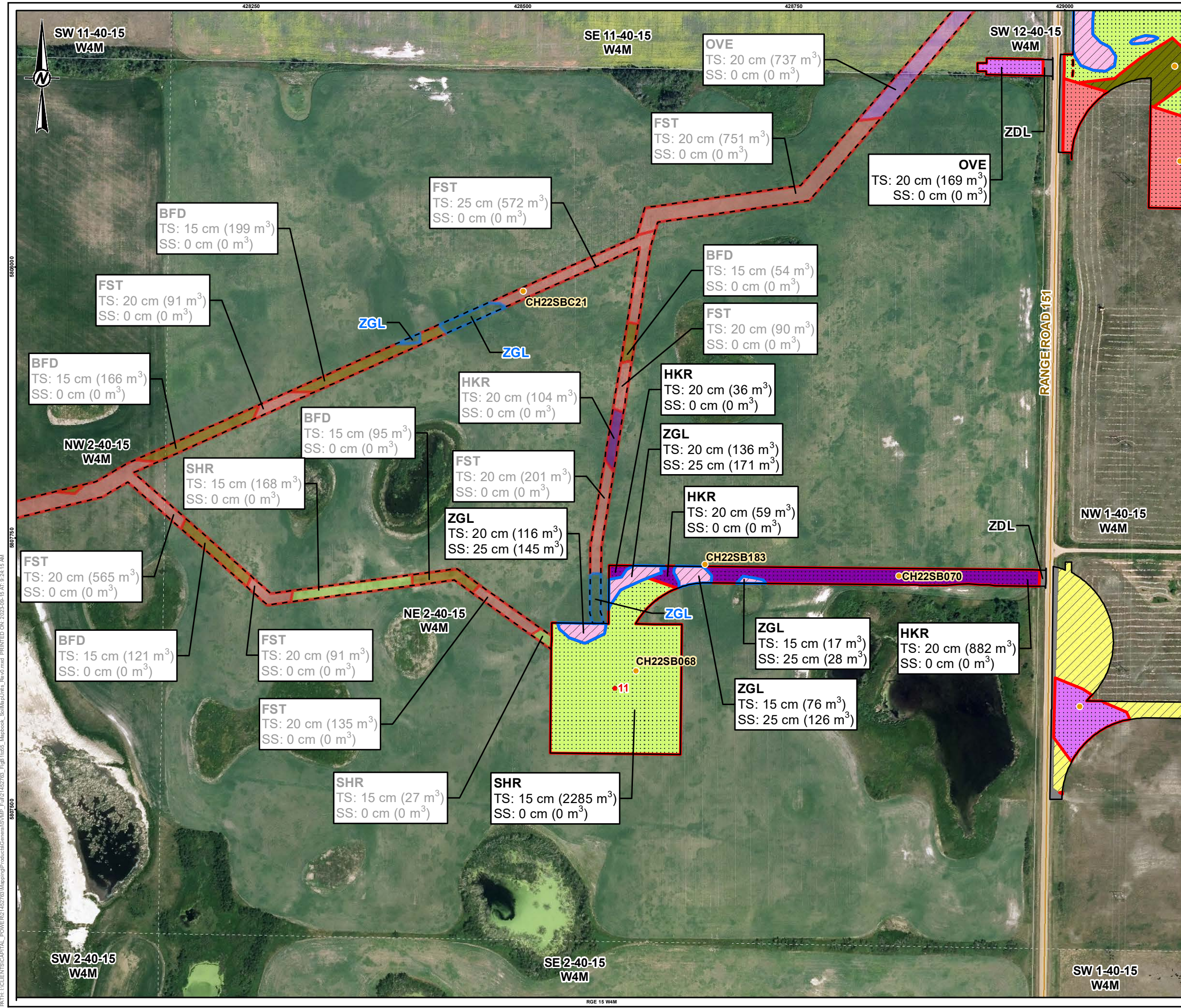
TITLE
**SOIL MAP UNITS WITHIN THE PROJECT FOOTPRINT
 NW 2-40-15 W4M**

CONSULTANT	YYYY-MM-DD	2023-09-15
DESIGNED	SC	
PREPARED	LB/NB	
REVIEWED	LS	
APPROVED	SC	

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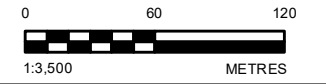
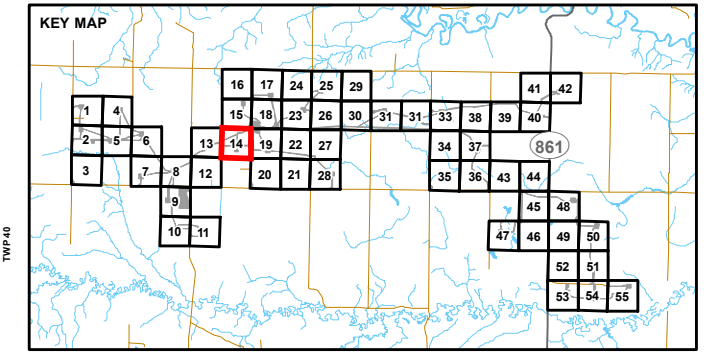
- 2022 SOIL INSPECTION SITE
- TURBINE
- LOCAL ROAD
- FOOTPRINT BOUNDARY
- FOOTPRINT (WITHOUT CRANE PATH)
- - - UNDERGROUND COLLECTOR SYSTEM
- TS TOPSOIL STRIPPING DEPTH AND VOLUME
- SS SUBSOIL STRIPPING DEPTH AND VOLUME
- TOPSOIL STRIPPING ONLY
- //// TOPSOIL AND SUBSOIL
- SPECIAL STOCKPILING REQUIREMENTS - FOOTPRINT WITHOUT CRANE PATH
- STOCKPILE WETLAND TOPSOIL AND SUBSOIL SEPARATE FROM NON-WETLAND TOPSOIL AND SUBSOIL¹
- STOCKPILE TOPSOIL SEPARATELY FROM NON-SALT AFFECTED SOIL MAP UNITS²
- SPECIAL SOIL STRIPPING AND WINDROWING REQUIREMENTS - UNDERGROUND COLLECTION SYSTEM
- NO SOIL STRIPPING - FOLLOW WETLAND MITIGATION MEASURES AND APPROVAL
- STRIP AND WINDROW TOPSOIL ONLY³

SOIL MAPPING - FOOTPRINT (WITHOUT CRANE PATH)

- FST - FLAGSTAFF
- HKR - HALKIRK
- HND - HUGHENDEN
- HNDgl - HUGHENDEN-GLEYED
- OVE - ONNEVUE
- SHR - SHEERNESS
- ZDL - DISTURBED LAND
- ZGL - MISCELLANEOUS GLEYSOL

SOIL MAPPING - UNDERGROUND COLLECTION SYSTEM

- BFD - BROWNFIELD
- FST - FLAGSTAFF
- HKR - HALKIRK
- OVE - ONNEVUE
- SHR - SHEERNESS



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 PROJECTION: UTM ZONE 12 DATUM: NAD 83

CLIENT

Capital Power

PROJECT
HALKIRK 2 WIND POWER PROJECT

TITLE
**SOIL MAP UNITS WITHIN THE PROJECT FOOTPRINT
 NE 2-40-15 W4M**

CONSULTANT	YYYY-MM-DD	2023-09-15
	DESIGNED	SC
	PREPARED	LB/NB
	REVIEWED	LS
	APPROVED	SC

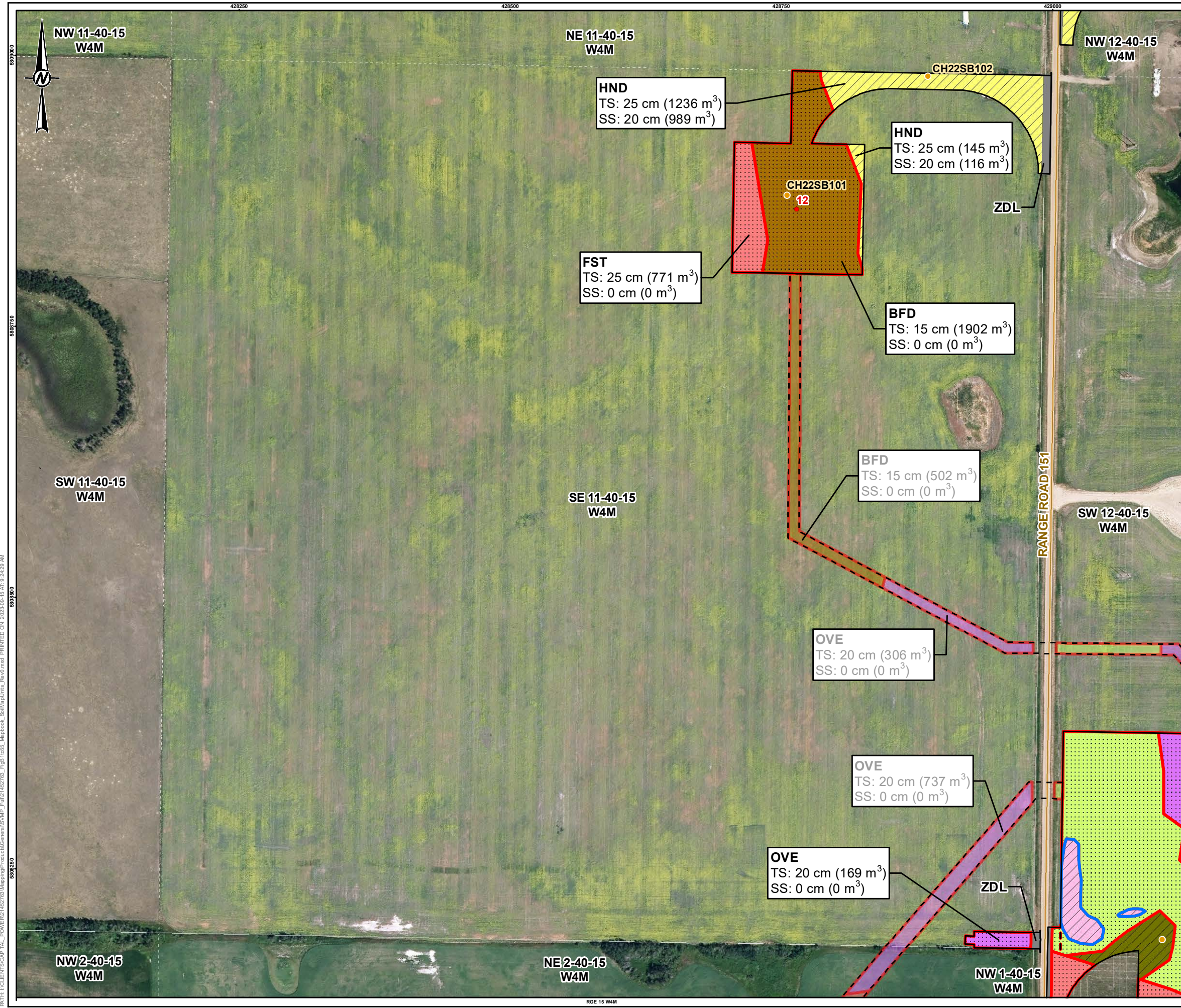
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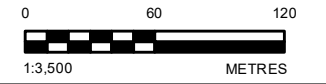
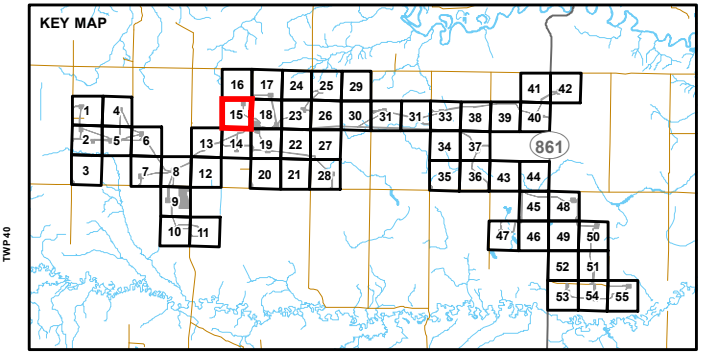
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IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B



- LEGEND**
- 2022 SOIL INSPECTION SITE
 - TURBINE
 - LOCAL ROAD
 - FOOTPRINT (WITHOUT CRANE PATH)
 - - - UNDERGROUND COLLECTOR SYSTEM
 - TS TOPSOIL STRIPPING DEPTH AND VOLUME
 - SS SUBSOIL STRIPPING DEPTH AND VOLUME
 - TOPSOIL STRIPPING ONLY
 - /// TOPSOIL AND SUBSOIL
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 - STRIP AND WINDROW TOPSOIL ONLY³
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 - HND - HUGHENDEN
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- SOIL MAPPING - UNDERGROUND COLLECTION SYSTEM**
- BFD - BROWNFIELD
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 PROJECTION: UTM ZONE 12 DATUM: NAD 83

CLIENT

Capital Power

PROJECT
HALKIRK 2 WIND POWER PROJECT

TITLE
**SOIL MAP UNITS WITHIN THE PROJECT FOOTPRINT
SE 11-40-15 W4M**

CONSULTANT	YYYY-MM-DD	2023-09-15
DESIGNED	SC	
PREPARED	LB/NB	
REVIEWED	LS	
APPROVED	SC	

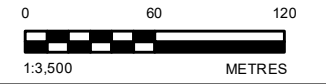
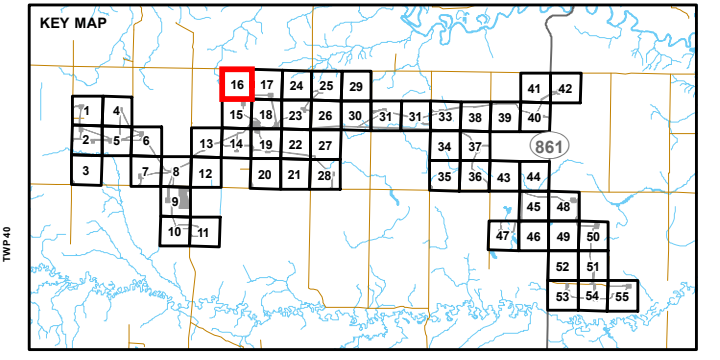
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IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B
 20mm



- LEGEND**
- 2022 SOIL INSPECTION SITE
 - LOCAL ROAD
 - WATERCOURSE
 - FOOTPRINT BOUNDARY**
 - FOOTPRINT (WITHOUT CRANE PATH)
 - UNDERGROUND COLLECTOR SYSTEM
 - TS** TOPSOIL STRIPPING DEPTH AND VOLUME
 - SS** SUBSOIL STRIPPING DEPTH AND VOLUME
 - TOPSOIL STRIPPING ONLY
 - TOPSOIL AND SUBSOIL
 - SPECIAL STOCKPILING REQUIREMENTS - FOOTPRINT WITHOUT CRANE PATH**
 - STOCKPILE TOPSOIL SEPARATELY FROM NON-SALT AFFECTED SOIL MAP UNITS²
- SOIL MAPPING - FOOTPRINT (WITHOUT CRANE PATH)**
- BFD - BROWNFIELD
 - HND - HUGHENDEN
 - ZDL - DISTURBED LAND



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 PROJECTION: UTM ZONE 12 DATUM: NAD 83

CLIENT

Capital Power

PROJECT
HALKIRK 2 WIND POWER PROJECT

TITLE
**SOIL MAP UNITS WITHIN THE PROJECT FOOTPRINT
 NE 11-40-15 W4M**

CONSULTANT	YYYY-MM-DD	2023-09-15
DESIGNED		SC
PREPARED		LB/NB
REVIEWED		LS
APPROVED		SC

PROJECT NO. CONTROL REV. FIGURE
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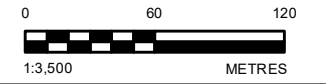
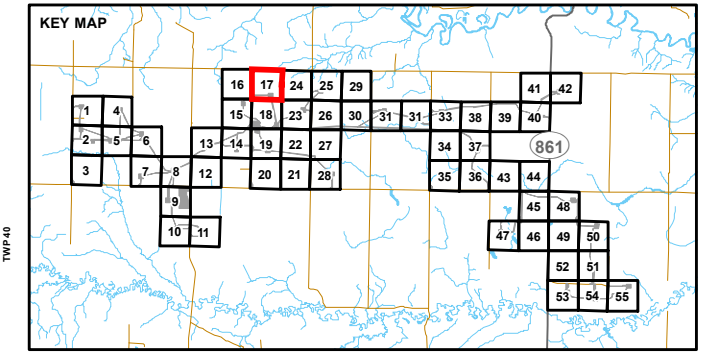
- 2022 SOIL INSPECTION SITE
- TURBINE
- LOCAL ROAD
- FOOTPRINT (WITHOUT CRANE PATH)
- - - UNDERGROUND COLLECTOR SYSTEM
- TS TOPSOIL STRIPPING DEPTH AND VOLUME
- SS SUBSOIL STRIPPING DEPTH AND VOLUME
- ⋯ TOPSOIL STRIPPING ONLY
- /// TOPSOIL AND SUBSOIL STRIPPING
- SPECIAL STOCKPILING REQUIREMENTS - FOOTPRINT WITHOUT CRANE PATH**
- STOCKPILE TOPSOIL SEPARATELY FROM NON-SALT AFFECTED SOIL MAP UNITS²
- SPECIAL SOIL STRIPPING AND WINDROWING REQUIREMENTS - UNDERGROUND COLLECTION SYSTEM**
- STRIP AND WINDROW TOPSOIL ONLY³

SOIL MAPPING - FOOTPRINT (WITHOUT CRANE PATH)

- HND - HUGHENDEN
- OVE - ONNEVUE
- SHR - SHEERNESS
- ZDL - DISTURBED LAND

SOIL MAPPING - UNDERGROUND COLLECTION SYSTEM

- OVE - ONNEVUE
- SHR - SHEERNESS



NOTE(S)

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 PROJECTION: UTM ZONE 12 DATUM: NAD 83

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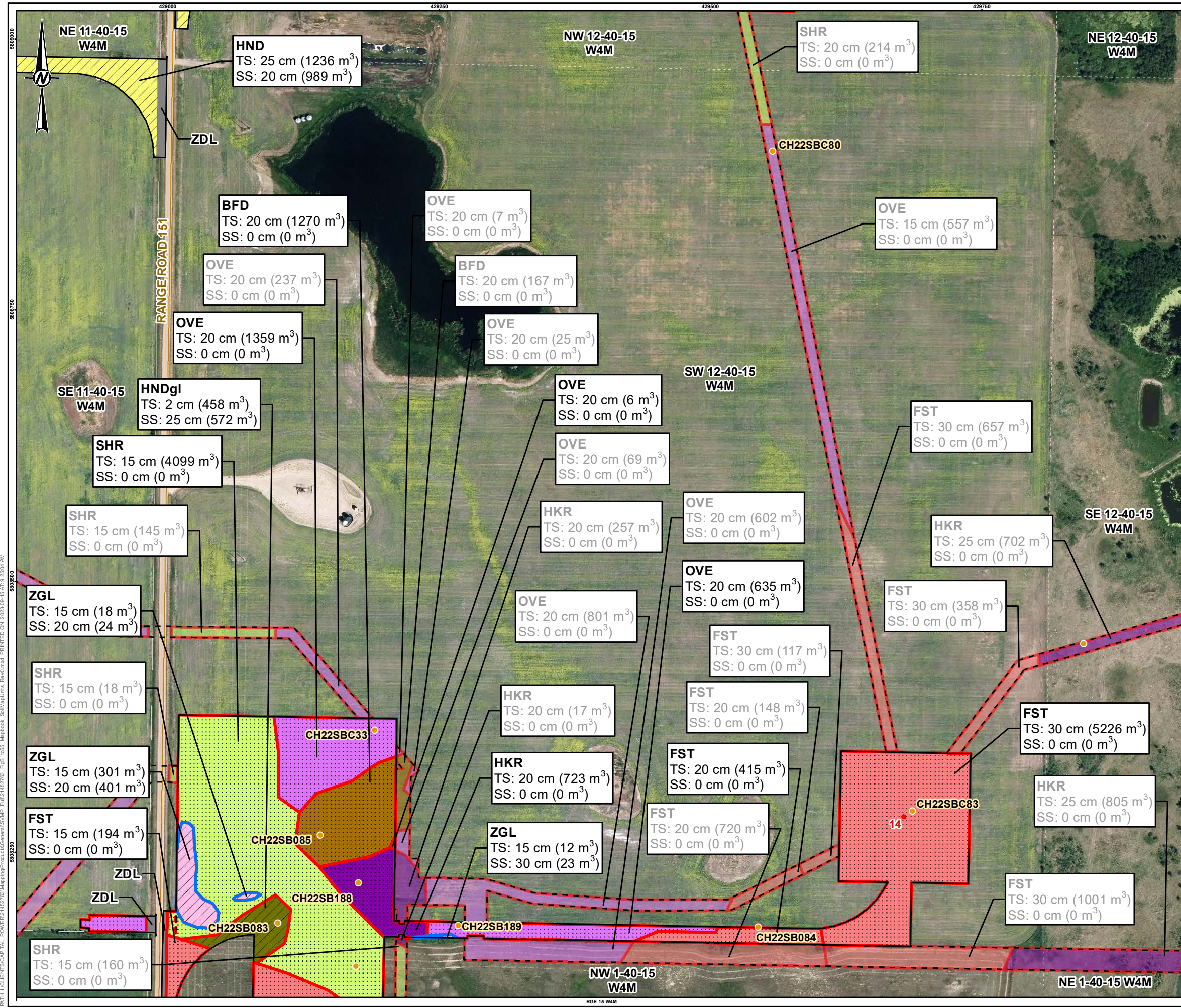
PROJECT
 HALKIRK 2 WIND POWER PROJECT

TITLE
SOIL MAP UNITS WITHIN THE PROJECT FOOTPRINT
 NW 12-40-15 W4M

CONSULTANT	YYYY-MM-DD	2023-09-15
	DESIGNED	SC
	PREPARED	LB/NB
	REVIEWED	LS
	APPROVED	SC

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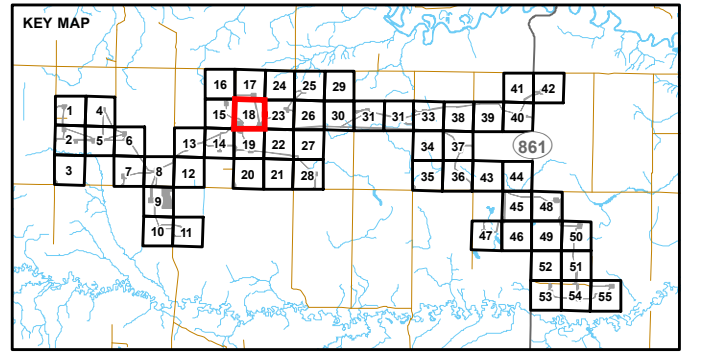
- 2022 SOIL INSPECTION SITE
- TURBINE
- LOCAL ROAD
- FOOTPRINT BOUNDARY
- FOOTPRINT (WITHOUT CRANE PATH)
- - - UNDERGROUND COLLECTOR SYSTEM
- TS TOPSOIL STRIPPING DEPTH AND VOLUME
- SS SUBSOIL STRIPPING DEPTH AND VOLUME
- TOPSOIL STRIPPING ONLY
- //// TOPSOIL AND SUBSOIL
- SPECIAL STOCKPILING REQUIREMENTS - FOOTPRINT WITHOUT CRANE PATH
- STOCKPILE WETLAND TOPSOIL AND SUBSOIL SEPARATE FROM NON-WETLAND TOPSOIL AND SUBSOIL¹
- STOCKPILE TOPSOIL SEPARATELY FROM NON-SALT AFFECTED SOIL MAP UNITS²
- SPECIAL SOIL STRIPPING AND WINDROWING REQUIREMENTS - UNDERGROUND COLLECTION SYSTEM
- STRIP AND WINDROW TOPSOIL ONLY³

SOIL MAPPING - FOOTPRINT (WITHOUT CRANE PATH)

- BFD - BROWNFIELD
- FST - FLAGSTAFF
- HKR - HALKIRK
- HND - HUGHENDEN
- HNDgl - HUGHENDEN-GLEYED
- OVE - ONNEVUE
- SHR - SHEERNESS
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 PROJECTION: UTM ZONE 12 DATUM: NAD 83

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Capital Power

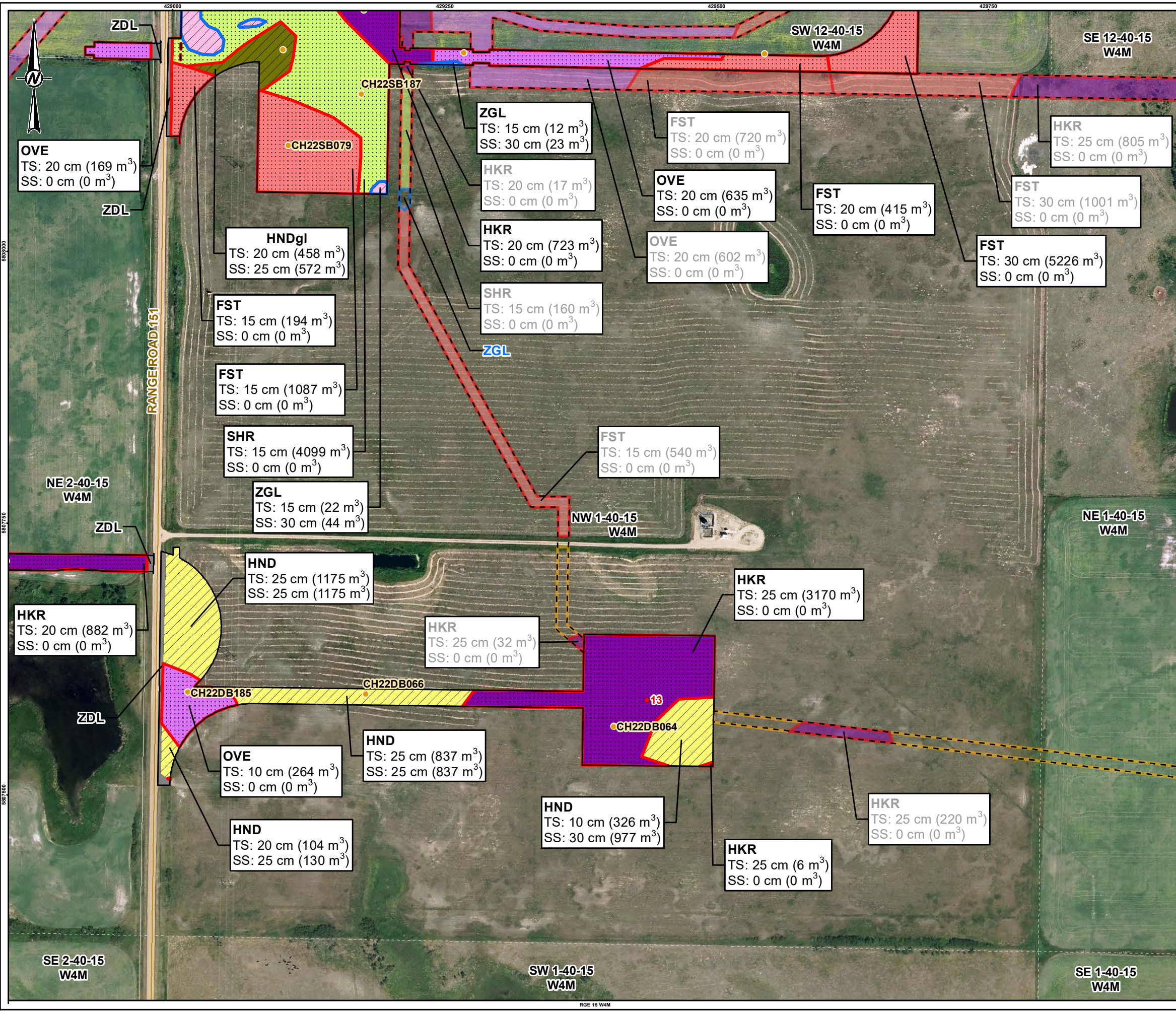
PROJECT
HALKIRK 2 WIND POWER PROJECT

TITLE
**SOIL MAP UNITS WITHIN THE PROJECT FOOTPRINT
 SW 12-40-15 W4M**

CONSULTANT	YYYY-MM-DD	2023-09-15
	DESIGNED	SC
	PREPARED	LB/NB
	REVIEWED	LS
	APPROVED	SC

PROJECT NO. CONTROL REV. FIGURE
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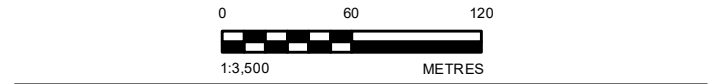
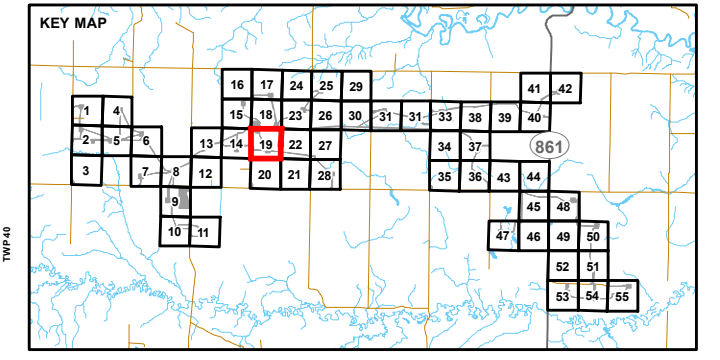
- 2022 SOIL INSPECTION SITE
- TURBINE
- LOCAL ROAD
- FOOTPRINT (WITHOUT CRANE PATH)
- - - UNDERGROUND COLLECTOR SYSTEM
- TS TOPSOIL STRIPPING DEPTH AND VOLUME
- SS SUBSOIL STRIPPING DEPTH AND VOLUME
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- STRIP AND WINDROW TOPSOIL ONLY³
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SOIL MAPPING - FOOTPRINT (WITHOUT CRANE PATH)

- FST - FLAGSTAFF
- HKR - HALKIRK
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 PROJECTION: UTM ZONE 12 DATUM: NAD 83

CLIENT

Capital Power

PROJECT
HALKIRK 2 WIND POWER PROJECT

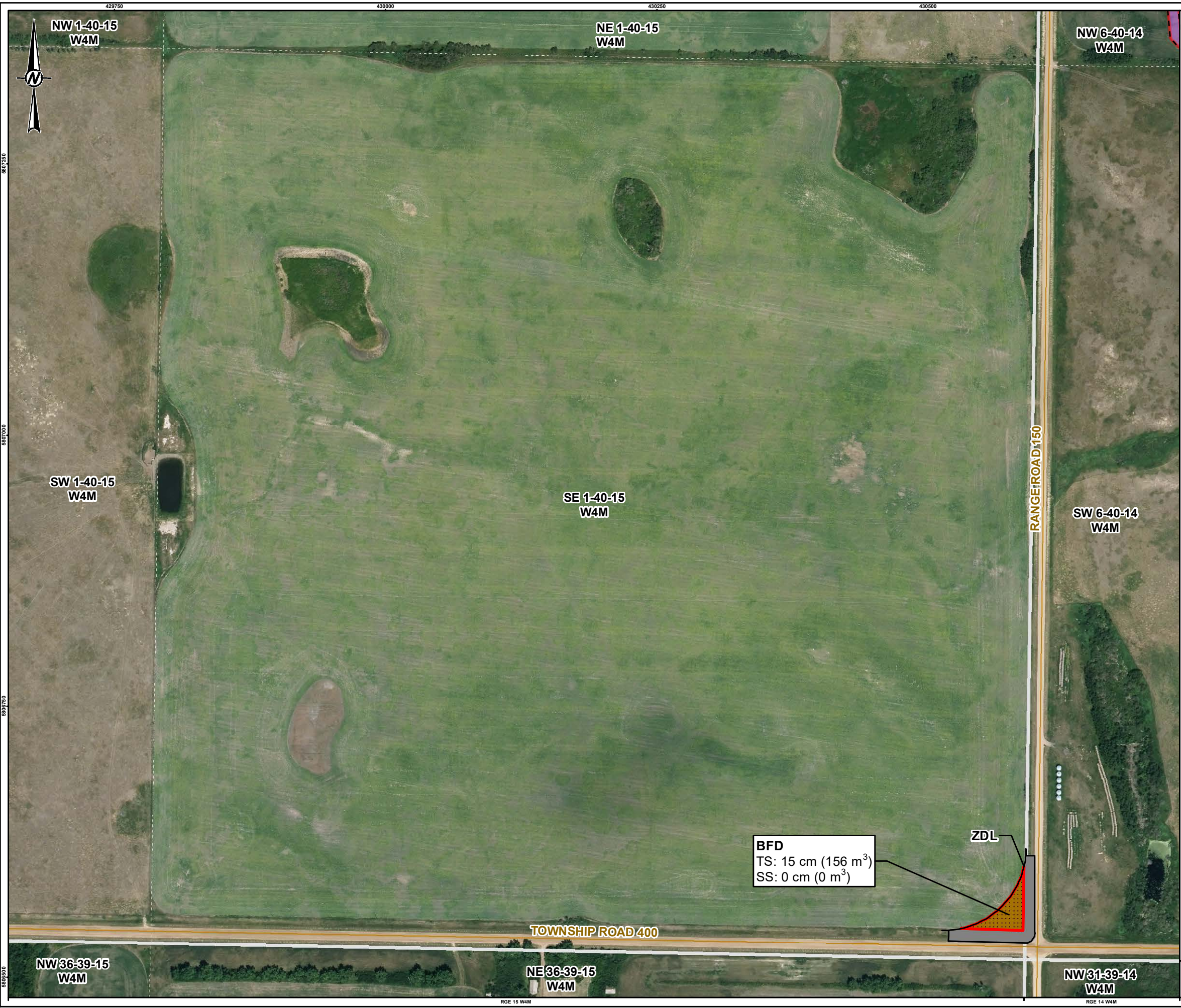
TITLE
**SOIL MAP UNITS WITHIN THE PROJECT FOOTPRINT
NW 1-40-15 W4M**

CONSULTANT	YYYY-MM-DD	2023-09-15
	DESIGNED	SC
	PREPARED	LB/NB
	REVIEWED	LS
	APPROVED	SC

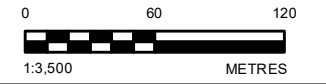
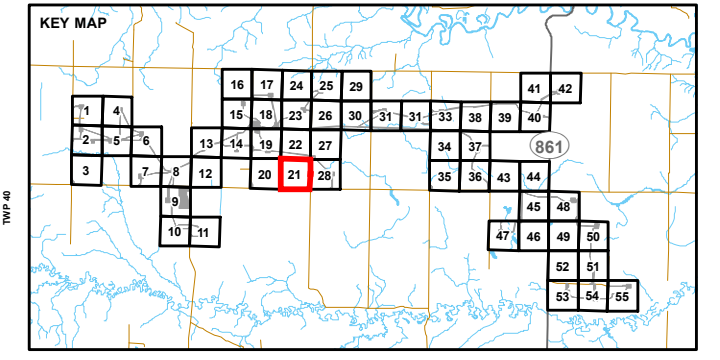
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IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B



- LEGEND**
- LOCAL ROAD
 - FOOTPRINT
 - FOOTPRINT (WITHOUT CRANE PATH)
 - UNDERGROUND COLLECTOR SYSTEM
 - TS TOPSOIL STRIPPING DEPTH AND VOLUME
 - SS SUBSOIL STRIPPING DEPTH AND VOLUME
 - TOPSOIL STRIPPING
 - SPECIAL STOCKPILING REQUIREMENTS - FOOTPRINT WITHOUT CRANE PATH
 - STOCKPILE TOPSOIL SEPARATELY FROM NON-SALT AFFECTED SOIL MAP UNITS²
 - SPECIAL SOIL STRIPPING AND WINDROWING REQUIREMENTS - UNDERGROUND COLLECTION SYSTEM
 - STRIP AND WINDROW TOPSOIL ONLY³
 - SOIL MAPPING - FOOTPRINT (WITHOUT CRANE PATH)
 - BFD - BROWNFIELD
 - ZDL - DISTURBED
 - SOIL MAPPING - UNDERGROUND COLLECTION SYSTEM
 - OVE - ONNEVUE



NOTE(S)

1. FOLLOW WETLAND MITIGATION MEASURES AND APPROVAL.
2. ALL POLYGONS WITH THIS SPECIAL STOCKPILING REQUIREMENT ARE PRESUMED TO BE SALT-AFFECTED; TOPSOIL FROM THESE POLYGONS CAN BE STOCKPILED TOGETHER, BUT MUST BE STOCKPILED SEPARATELY FROM POLYGONS WITHOUT THIS SPECIAL STOCKPILING REQUIREMENT.
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REFERENCE(S)

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 PROJECTION: UTM ZONE 12 DATUM: NAD 83

CLIENT

Capital Power

PROJECT

HALKIRK 2 WIND POWER PROJECT

TITLE

SOIL MAP UNITS WITHIN THE PROJECT FOOTPRINT
SE 1-40-15 W4M

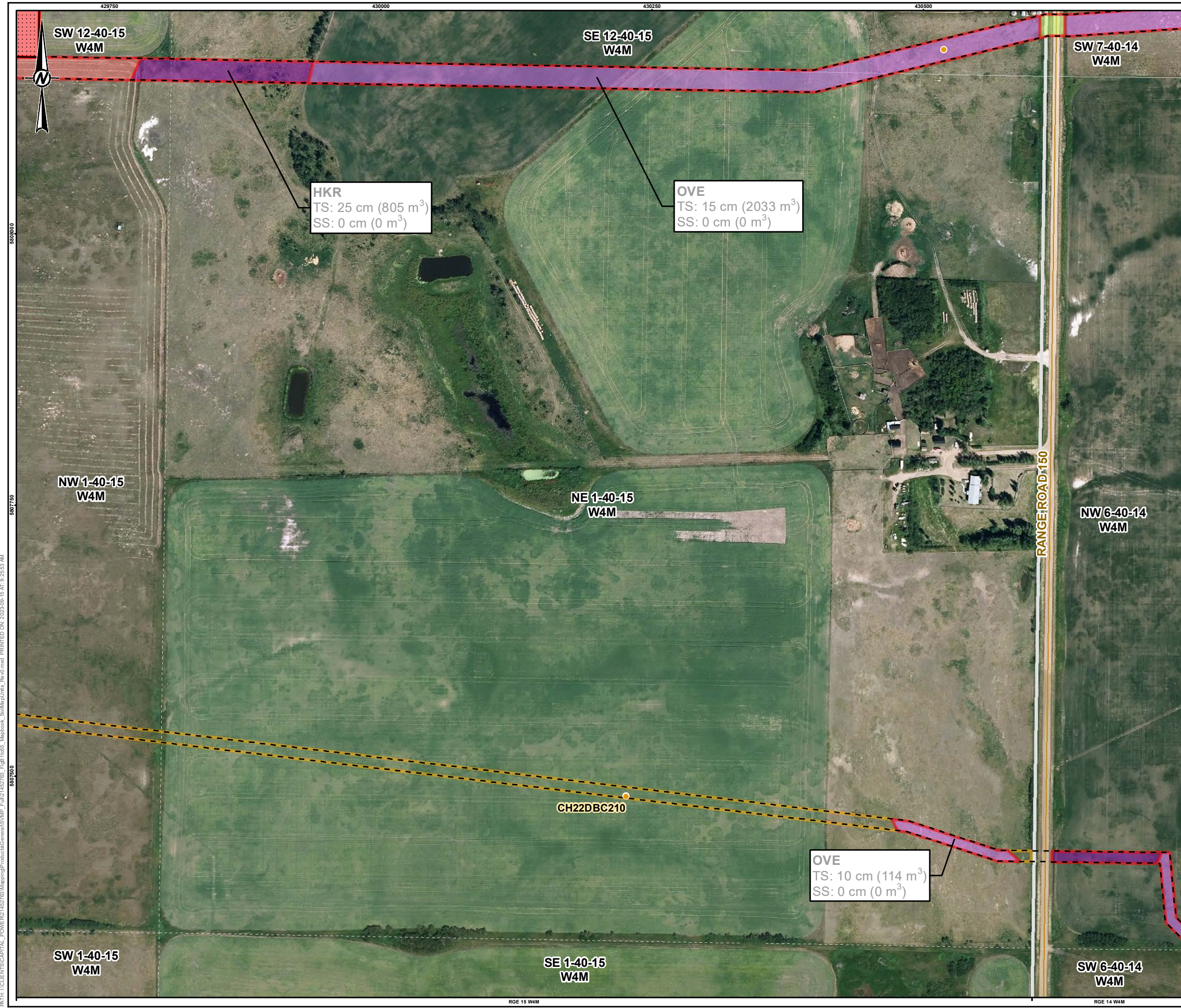
CONSULTANT	YYYY-MM-DD	2023-09-15
DESIGNED	SC	
PREPARED	LB/NB	
REVIEWED	LS	
APPROVED	SC	

PROJECT NO. CONTROL REV. FIGURE

21452763 0 B-21

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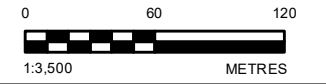
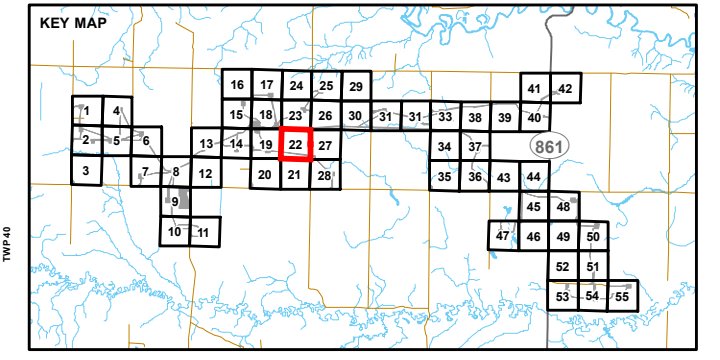


LEGEND

- 2022 SOIL INSPECTION SITE
- LOCAL ROAD
- FOOTPRINT (WITHOUT CRANE PATH)
- - - UNDERGROUND COLLECTOR SYSTEM
- TS TOPSOIL STRIPPING DEPTH AND VOLUME
- SS SUBSOIL STRIPPING DEPTH AND VOLUME
- ⋯ TOPSOIL STRIPPING
- SPECIAL STOCKPILING REQUIREMENTS - FOOTPRINT WITHOUT CRANE PATH
- STOCKPILE TOPSOIL SEPARATELY FROM NON-SALT AFFECTED SOIL MAP UNITS²
- SPECIAL SOIL STRIPPING AND WINDROWING REQUIREMENTS - UNDERGROUND COLLECTION SYSTEM
- STRIP AND WINDROW TOPSOIL ONLY³
- NO SOIL STRIPPING

SOIL MAPPING - FOOTPRINT (WITHOUT CRANE PATH)

- FST - FLAGSTAFF
- FST - FLAGSTAFF
- HKR - HALKIRK
- OVE - ONNEVUE
- SHR - SHEERNESS



NOTE(S)

1. FOLLOW WETLAND MITIGATION MEASURES AND APPROVAL.
2. ALL POLYGONS WITH THIS SPECIAL STOCKPILING REQUIREMENT ARE PRESUMED TO BE SALT-AFFECTED; TOPSOIL FROM THESE POLYGONS CAN BE STOCKPILED TOGETHER, BUT MUST BE STOCKPILED SEPARATELY FROM POLYGONS WITHOUT THIS SPECIAL STOCKPILING REQUIREMENT.
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 PROJECTION: UTM ZONE 12 DATUM: NAD 83

CLIENT

Capital Power

PROJECT

HALKIRK 2 WIND POWER PROJECT

TITLE

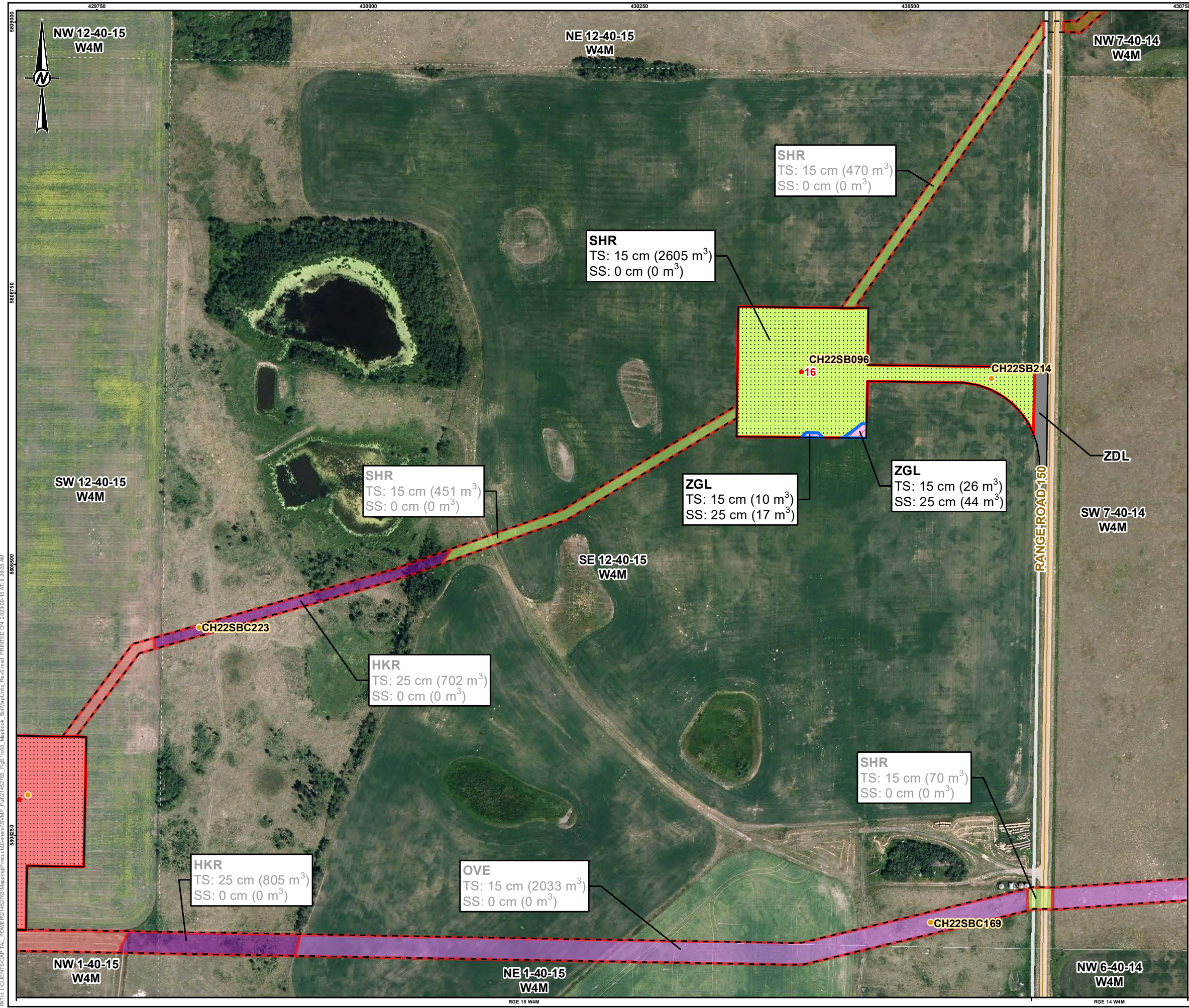
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NE 1-40-15 W4M**

CONSULTANT	DATE
DESIGNED	2023-09-15
PREPARED	SC
REVIEWED	LB/NB
APPROVED	LS
	SC

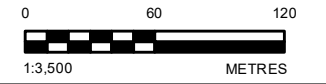
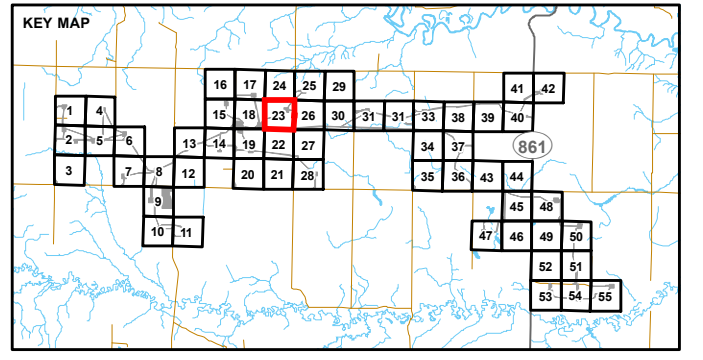
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IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B



- LEGEND**
- 2022 SOIL INSPECTION SITE
 - TURBINE
 - LOCAL ROAD
 - FOOTPRINT (WITHOUT CRANE PATH)
 - UNDERGROUND COLLECTOR SYSTEM
 - TS TOPSOIL STRIPPING DEPTH AND VOLUME
 - SS SUBSOIL STRIPPING DEPTH AND VOLUME
 - TOPSOIL STRIPPING
 - //// TOPSOIL AND SUBSOIL
 - SPECIAL STOCKPILING REQUIREMENTS - FOOTPRINT WITHOUT CRANE PATH**
 - STOCKPILE WETLAND TOPSOIL AND SUBSOIL SEPARATE FROM NON-WETLAND TOPSOIL AND SUBSOIL¹
 - STOCKPILE TOPSOIL SEPARATELY FROM NON-SALT AFFECTED SOIL MAP UNITS²
 - SPECIAL SOIL STRIPPING AND WINDROWING REQUIREMENTS - UNDERGROUND COLLECTION SYSTEM**
 - STRIP AND WINDROW TOPSOIL ONLY³
- SOIL MAPPING - FOOTPRINT (WITHOUT CRANE PATH)**
- FST - FLAGSTAFF
 - SHR - SHEERNESS
 - ZDL - DISTURBED
 - ZGL - MISCELLANEOUS GLEYSOL
- SOIL MAPPING - UNDERGROUND COLLECTION SYSTEM**
- BFD - BROWNFIELD
 - FST - FLAGSTAFF
 - HKR - HALKIRK
 - OVE - ONNEVUE
 - SHR - SHEERNESS



NOTE(S)

1. FOLLOW WETLAND MITIGATION MEASURES AND APPROVAL.
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PROJECTION: UTM ZONE 12 DATUM: NAD 83

CLIENT

Capital Power

PROJECT
HALKIRK 2 WIND POWER PROJECT

TITLE
**SOIL MAP UNITS WITHIN THE PROJECT FOOTPRINT
SE 12-40-15 W4M**

CONSULTANT

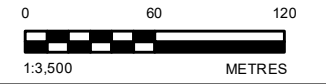
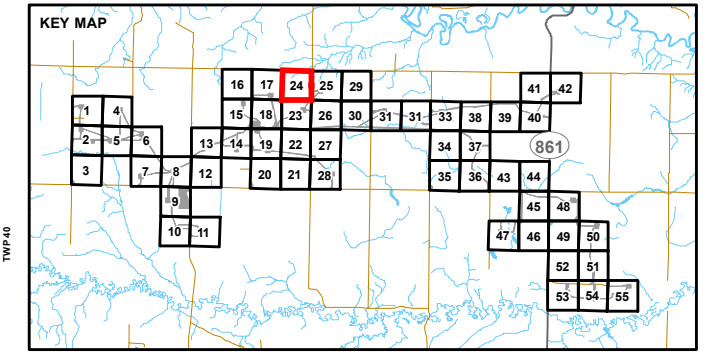
YYYY-MM-DD	2023-09-15
DESIGNED	SC
PREPARED	LB/NB
REVIEWED	LS
APPROVED	SC

PROJECT NO. 21452763 CONTROL REV. 0 FIGURE B-23

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 IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B



- LEGEND**
- 2022 SOIL INSPECTION SITE
 - LOCAL ROAD
 - WATERCOURSE
 - FOOTPRINT BOUNDARY**
 - FOOTPRINT (WITHOUT CRANE PATH)
 - UNDERGROUND COLLECTOR SYSTEM
 - TS TOPSOIL STRIPPING DEPTH AND VOLUME
 - SS SUBSOIL STRIPPING DEPTH AND VOLUME
 - TOPSOIL STRIPPING ONLY
 - SPECIAL STOCKPILING REQUIREMENTS - FOOTPRINT WITHOUT CRANE PATH**
 - STOCKPILE TOPSOIL SEPARATELY FROM NON-SALT AFFECTED SOIL MAP UNITS²
 - SPECIAL SOIL STRIPPING AND WINDROWING REQUIREMENTS - UNDERGROUND COLLECTION SYSTEM**
 - STRIP AND WINDROW TOPSOIL ONLY³
 - SOIL MAPPING - FOOTPRINT (WITHOUT CRANE PATH)**
 - BFD - BROWNFIELD
 - ZDL - DISTURBED LAND
 - SOIL MAPPING - UNDERGROUND COLLECTION SYSTEM**
 - BFD - BROWNFIELD
 - SHR - SHEERNESS



- NOTE(S)**
1. FOLLOW WETLAND MITIGATION MEASURES AND APPROVAL.
 2. ALL POLYGONS WITH THIS SPECIAL STOCKPILING REQUIREMENT ARE PRESUMED TO BE SALT-AFFECTED; TOPSOIL FROM THESE POLYGONS CAN BE STOCKPILED TOGETHER, BUT MUST BE STOCKPILED SEPARATELY FROM POLYGONS WITHOUT THIS SPECIAL STOCKPILING REQUIREMENT.
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 PROJECTION: UTM ZONE 12 DATUM: NAD 83

CLIENT
Capital Power

PROJECT
 HALKIRK 2 WIND POWER PROJECT

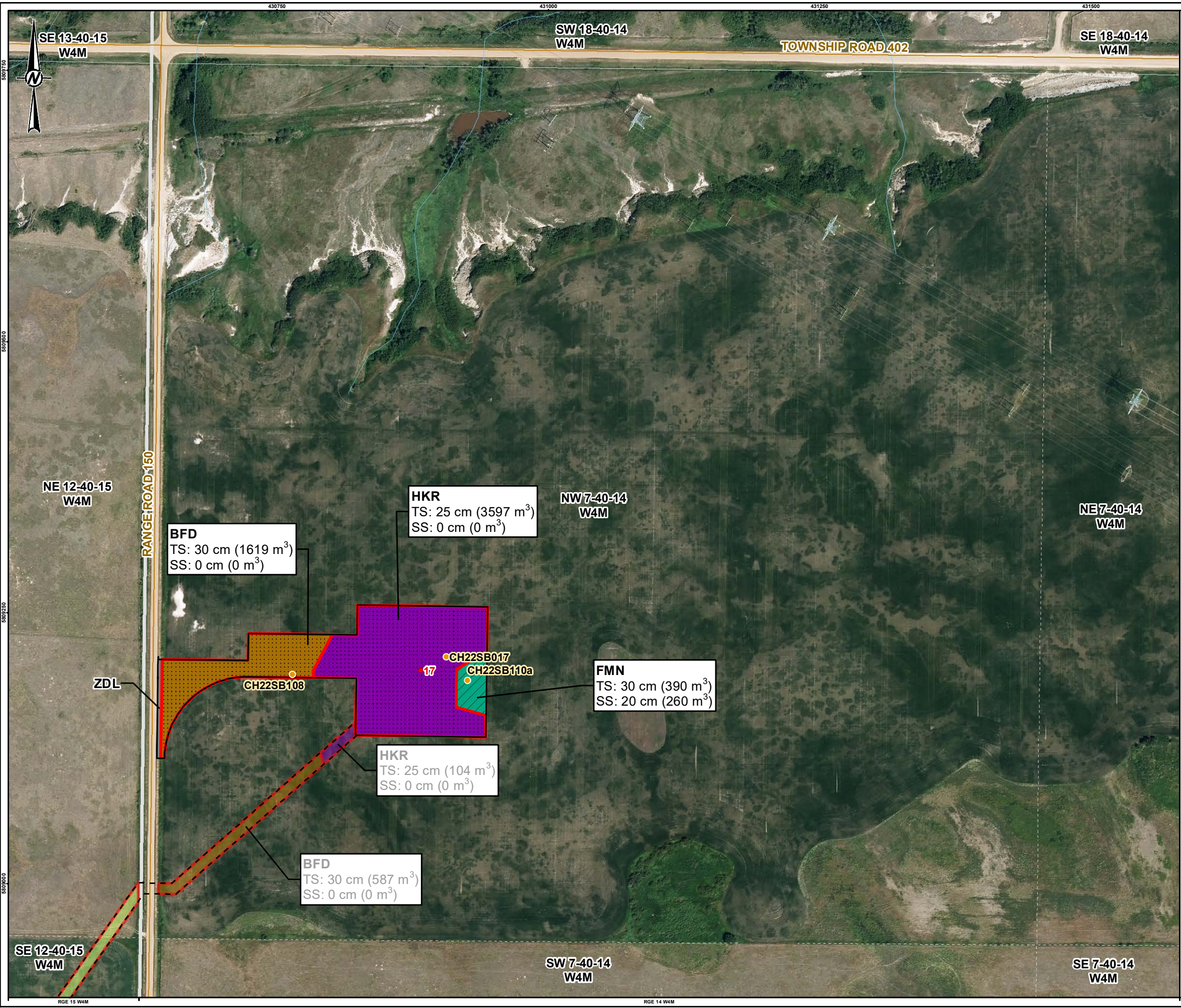
TITLE
SOIL MAP UNITS WITHIN THE PROJECT FOOTPRINT
 NE 12-40-15 W4M

CONSULTANT	YYYY-MM-DD	2023-09-15
DESIGNED	SC	
PREPARED	LB/NB	
REVIEWED	LS	
APPROVED	SC	

PROJECT NO. CONTROL REV. FIGURE
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IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B
 26mm



LEGEND

- 2022 SOIL INSPECTION SITE
- TURBINE
- LOCAL ROAD
- WATERCOURSE

FOOTPRINT BOUNDARY

- FOOTPRINT (WITHOUT CRANE PATH)
- - - UNDERGROUND COLLECTOR SYSTEM

TS TOPSOIL STRIPPING DEPTH AND VOLUME

SS SUBSOIL STRIPPING DEPTH AND VOLUME

- TOPSOIL STRIPPING ONLY
- /// TOPSOIL AND SUBSOIL

SPECIAL STOCKPILING REQUIREMENTS - FOOTPRINT WITHOUT CRANE PATH

- STOCKPILE TOPSOIL SEPARATELY FROM NON-SALT AFFECTED SOIL MAP UNITS²

SPECIAL SOIL STRIPPING AND WINDROWING REQUIREMENTS - UNDERGROUND COLLECTION SYSTEM

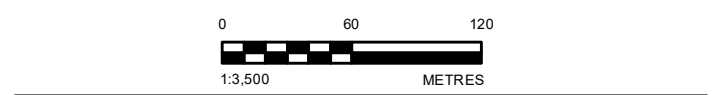
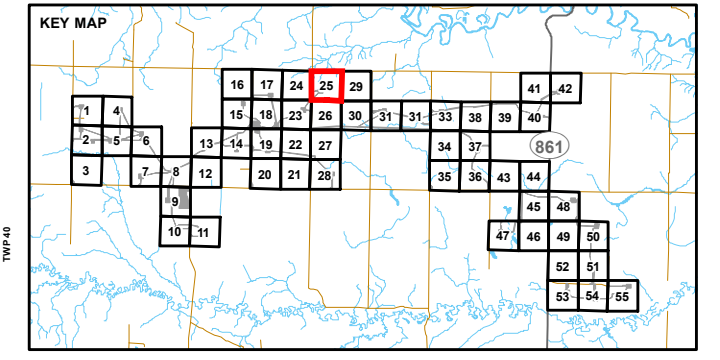
- STRIP AND WINDROW TOPSOIL ONLY³

SOIL MAPPING - FOOTPRINT (WITHOUT CRANE PATH)

- BFD - BROWNFIELD
- FMN - FOREMAN
- HKR - HALKIRK
- ZDL - DISTURBED LAND

SOIL MAPPING - UNDERGROUND COLLECTION SYSTEM

- BFD - BROWNFIELD
- HKR - HALKIRK
- SHR - SHEERNESS



NOTE(S)

1. FOLLOW WETLAND MITIGATION MEASURES AND APPROVAL.
2. ALL POLYGONS WITH THIS SPECIAL STOCKPILING REQUIREMENT ARE PRESUMED TO BE SALT-AFFECTED; TOPSOIL FROM THESE POLYGONS CAN BE STOCKPILED TOGETHER, BUT MUST BE STOCKPILED SEPARATELY FROM POLYGONS WITHOUT THIS SPECIAL STOCKPILING REQUIREMENT.
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 PROJECTION: UTM ZONE 12 DATUM: NAD 83

CLIENT

Capital Power

PROJECT

HALKIRK 2 WIND POWER PROJECT

TITLE

**SOIL MAP UNITS WITHIN THE PROJECT FOOTPRINT
 NW 7-40-14 W4M**

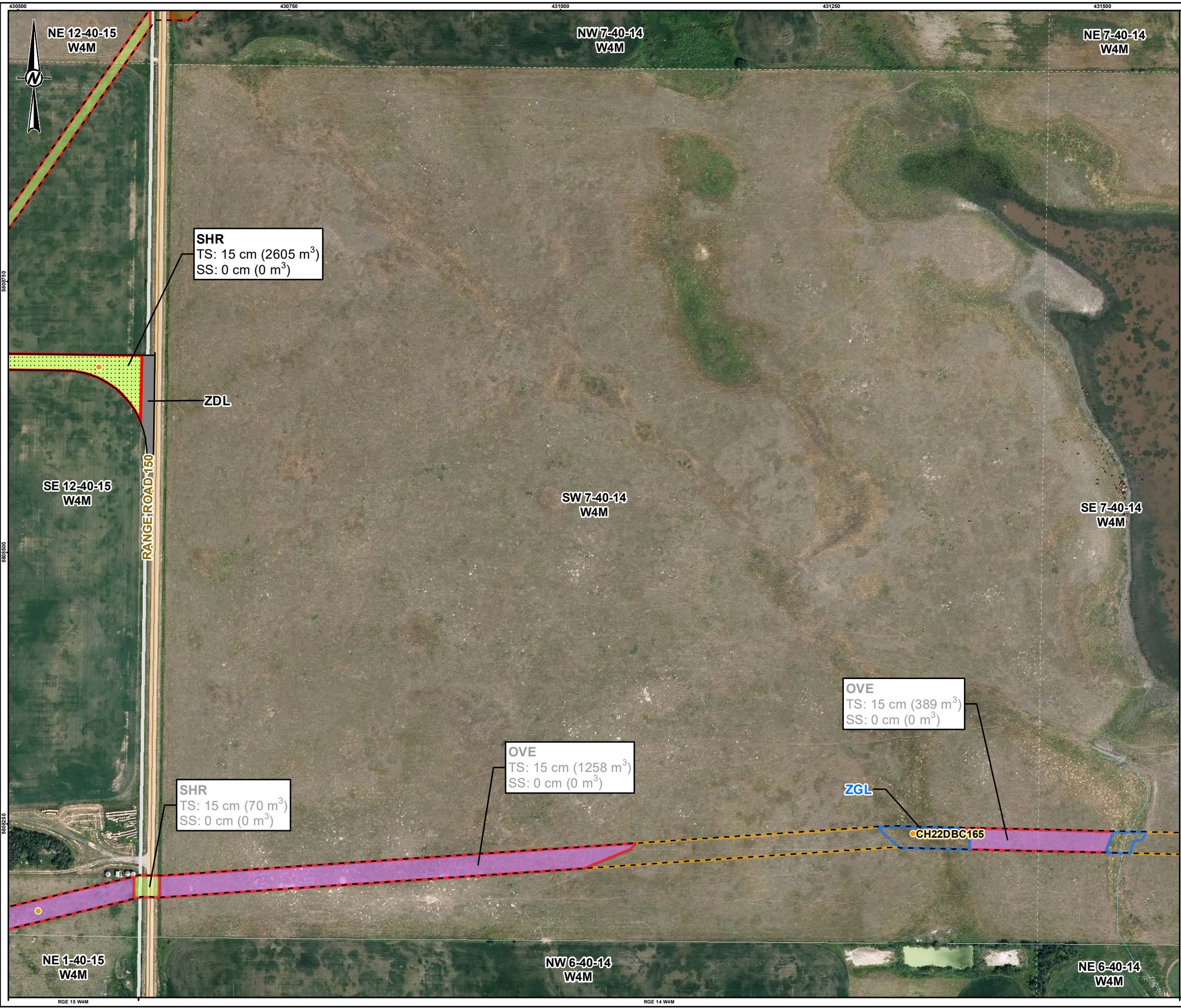
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REVIEWED	LB/NB
APPROVED	LS
	SC

PROJECT NO. CONTROL REV. FIGURE

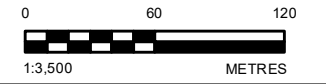
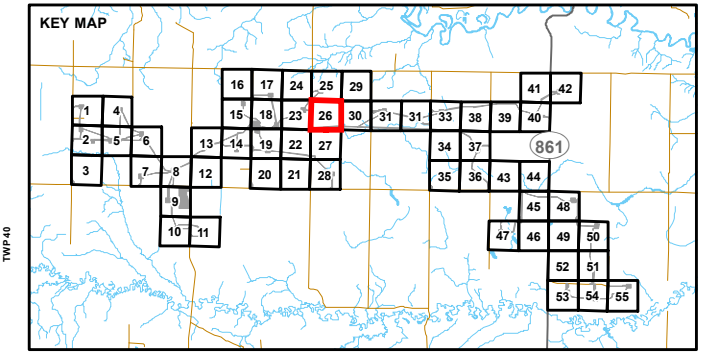
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IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B
 20mm



- LEGEND**
- 2022 SOIL INSPECTION SITE
 - LOCAL ROAD
 - WATERCOURSE
 - FOOTPRINT BOUNDARY
 - FOOTPRINT (WITHOUT CRANE PATH)
 - UNDERGROUND COLLECTOR SYSTEM
 - TS TOPSOIL STRIPPING DEPTH AND VOLUME
 - SS SUBSOIL STRIPPING DEPTH AND VOLUME
 - TOPSOIL STRIPPING ONLY
 - SPECIAL STOCKPILING REQUIREMENTS - FOOTPRINT WITHOUT CRANE PATH
 - STOCKPILE TOPSOIL SEPARATELY FROM NON-SALT AFFECTED SOIL MAP UNITS²
 - SPECIAL SOIL STRIPPING AND WINDROWING REQUIREMENTS - UNDERGROUND COLLECTION SYSTEM
 - NO SOIL STRIPPING - FOLLOW WETLAND MITIGATION MEASURES AND APPROVAL
 - STRIP AND WINDROW TOPSOIL ONLY³
 - NO SOIL STRIPPING
- SOIL MAPPING - FOOTPRINT (WITHOUT CRANE PATH)**
- SHR - SHEERNESS
 - ZDL - DISTURBED LAND
- SOIL MAPPING - UNDERGROUND COLLECTION SYSTEM**
- BFD - BROWNFIELD
 - OVE - ONNEVUE
 - SHR - SHEERNESS



NOTE(S)

1. FOLLOW WETLAND MITIGATION MEASURES AND APPROVAL.
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 PROJECTION: UTM ZONE 12 DATUM: NAD 83

CLIENT

Capital Power

PROJECT

HALKIRK 2 WIND POWER PROJECT

TITLE

**SOIL MAP UNITS WITHIN THE PROJECT FOOTPRINT
SW 7-40-14 W4M**

CONSULTANT	YYYY-MM-DD	2023-09-15
DESIGNED	SC	
PREPARED	LB/NB	
REVIEWED	LS	
APPROVED	SC	

PROJECT NO. CONTROL REV. FIGURE

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IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B
 20mm



LEGEND

- 2022 SOIL INSPECTION SITE
- LOCAL ROAD
- WATERCOURSE

FOOTPRINT BOUNDARY

- FOOTPRINT (WITHOUT CRANE PATH)
- - - UNDERGROUND COLLECTOR SYSTEM

TS TOPSOIL STRIPPING DEPTH AND VOLUME

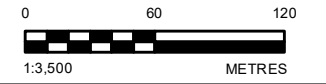
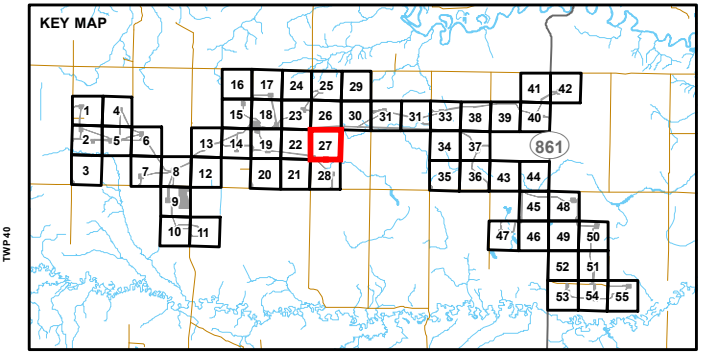
SS SUBSOIL STRIPPING DEPTH AND VOLUME

SPECIAL SOIL STRIPPING AND WINDROWING REQUIREMENTS - UNDERGROUND COLLECTION SYSTEM

- STRIP AND WINDROW TOPSOIL ONLY³
- NO SOIL STRIPPING

SOIL MAPPING - UNDERGROUND COLLECTION SYSTEM

- HKR - HALKIRK
- OVE - ONNEVUE
- SHR - SHEERNESS



NOTE(S)

1. FOLLOW WETLAND MITIGATION MEASURES AND APPROVAL.
2. ALL POLYGONS WITH THIS SPECIAL STOCKPILING REQUIREMENT ARE PRESUMED TO BE SALT-AFFECTED; TOPSOIL FROM THESE POLYGONS CAN BE STOCKPILED TOGETHER, BUT MUST BE STOCKPILED SEPARATELY FROM POLYGONS WITHOUT THIS SPECIAL STOCKPILING REQUIREMENT.
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 PROJECTION: UTM ZONE 12 DATUM: NAD 83

CLIENT

Capital Power

PROJECT
 HALKIRK 2 WIND POWER PROJECT

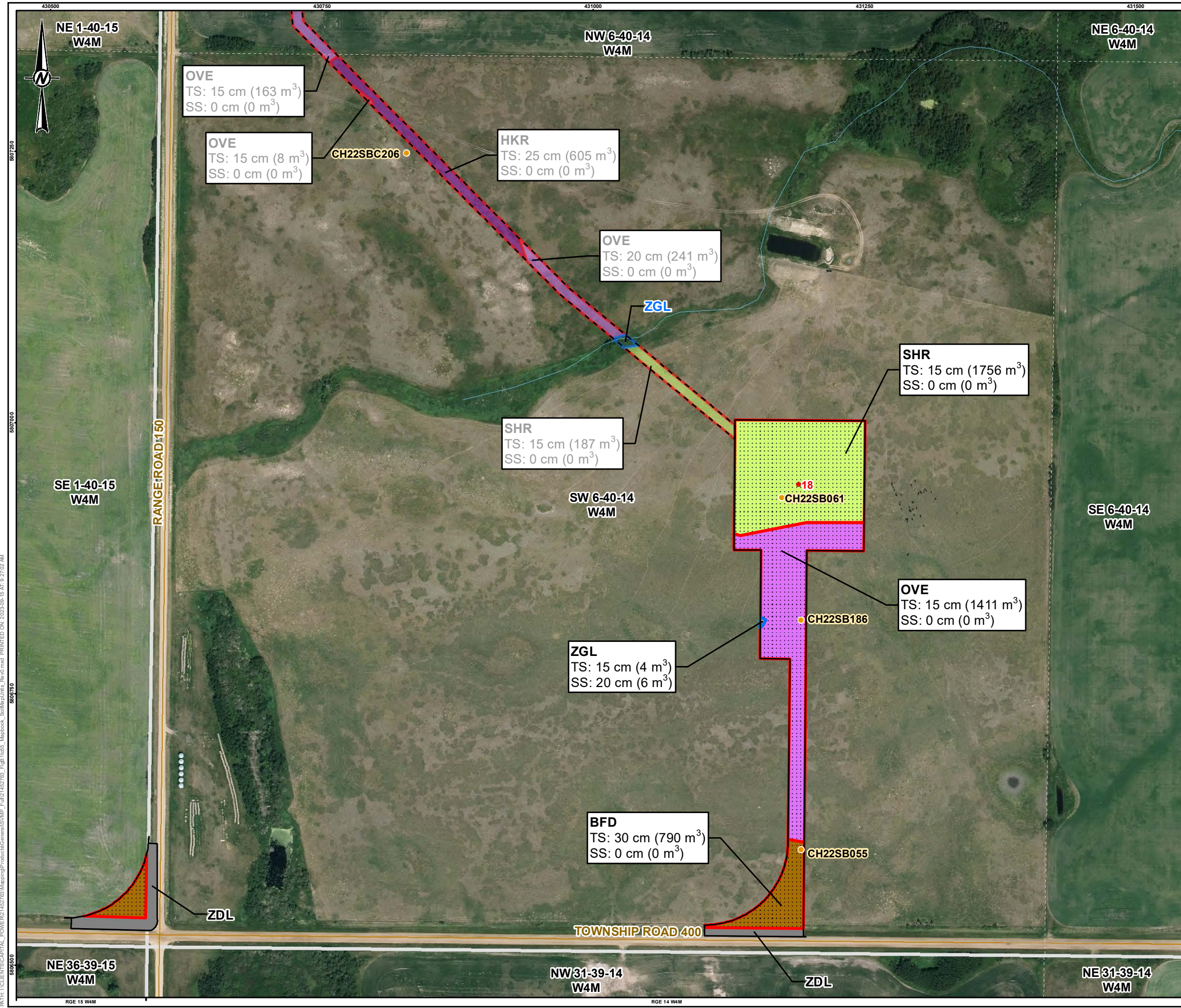
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SOIL MAP UNITS WITHIN THE PROJECT FOOTPRINT
 NW 6-40-14 W4M

CONSULTANT	YYYY-MM-DD	2023-09-15
	DESIGNED	SC
	PREPARED	LB/NB
	REVIEWED	LS
	APPROVED	SC

PROJECT NO. CONTROL REV. FIGURE
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IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B



LEGEND

- 2022 SOIL INSPECTION SITE
- TURBINE
- LOCAL ROAD
- WATERCOURSE

FOOTPRINT BOUNDARY

- FOOTPRINT (WITHOUT CRANE PATH)
- UNDERGROUND COLLECTOR SYSTEM

TS TOPSOIL STRIPPING DEPTH AND VOLUME

SS SUBSOIL STRIPPING DEPTH AND VOLUME

- TOPSOIL STRIPPING ONLY
- TOPSOIL AND SUBSOIL

SPECIAL STOCKPILING REQUIREMENTS - FOOTPRINT WITHOUT CRANE PATH

- STOCKPILE WETLAND TOPSOIL AND SUBSOIL SEPARATE FROM NON-WETLAND TOPSOIL AND SUBSOIL¹
- STOCKPILE TOPSOIL SEPARATELY FROM NON-SALT AFFECTED SOIL MAP UNITS²

SPECIAL SOIL STRIPPING AND WINDROWING REQUIREMENTS - UNDERGROUND COLLECTION SYSTEM

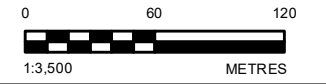
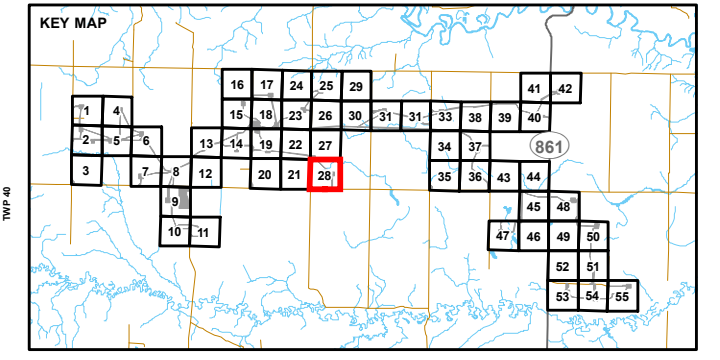
- NO SOIL STRIPPING - FOLLOW WETLAND MITIGATION MEASURES AND APPROVAL
- STRIP AND WINDROW TOPSOIL ONLY³

SOIL MAPPING - FOOTPRINT (WITHOUT CRANE PATH)

- BFD - BROWNFIELD
- OVE - ONNEVUE
- SHR - SHEERNESS
- ZDL - DISTURBED LAND
- ZGL - MISCELLANEOUS GLEYSOL

SOIL MAPPING - UNDERGROUND COLLECTION SYSTEM

- HKR - HALKIRK
- OVE - ONNEVUE
- SHR - SHEERNESS



NOTE(S)

1. FOLLOW WETLAND MITIGATION MEASURES AND APPROVAL.
2. ALL POLYGONS WITH THIS SPECIAL STOCKPILING REQUIREMENT ARE PRESUMED TO BE SALT-AFFECTED; TOPSOIL FROM THESE POLYGONS CAN BE STOCKPILED TOGETHER, BUT MUST BE STOCKPILED SEPARATELY FROM POLYGONS WITHOUT THIS SPECIAL STOCKPILING REQUIREMENT.
3. IN CULTIVATED LANDS WHERE SALT-AFFECTED SOILS HAVE BEEN IDENTIFIED, IT IS RECOMMENDED THAT TOPSOIL WILL BE SALVAGED AND WINDROWED PRIOR TO PLOUGHING IN COLLECTOR LINES DURING PERIODS OF FROZEN GROUND CONDITIONS TO AVOID MIXING SALT-AFFECTED UPPER SUBSOIL INTO TOPSOIL.

REFERENCE(S)

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 PROJECTION: UTM ZONE 12 DATUM: NAD 83

CLIENT

Capital Power

PROJECT
 HALKIRK 2 WIND POWER PROJECT

TITLE
**SOIL MAP UNITS WITHIN THE PROJECT FOOTPRINT
 SW 6-40-14 W4M**

CONSULTANT

YYYY-MM-DD	2023-09-15
DESIGNED	SC
PREPARED	LB/NB
REVIEWED	LS
APPROVED	SC

PROJECT NO. CONTROL REV. FIGURE
 21452763 0 B-28

PATH: I:\CLIENT\CAPITAL_POWER\21452763\Mapping\Products\General\SWMP_FigB1452763_FigB1452763_Mapbook_SoilMapUnits_Rev0.mxd PRINTED ON: 2023-09-15 AT 12:27:02 AM
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 IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

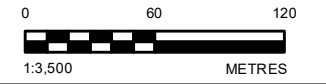
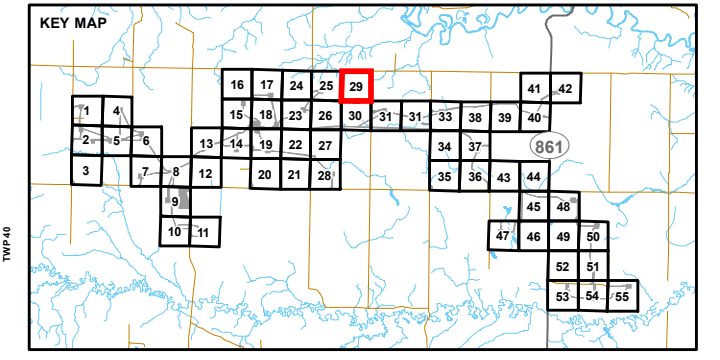


LEGEND

- 2022 SOIL INSPECTION SITE
- LOCAL ROAD
- WATERCOURSE
- FOOTPRINT BOUNDARY
- FOOTPRINT (WITHOUT CRANE PATH)
- - - UNDERGROUND COLLECTOR SYSTEM
- TS TOPSOIL STRIPPING DEPTH AND VOLUME
- SS SUBSOIL STRIPPING DEPTH AND VOLUME
- /// TOPSOIL AND SUBSOIL

SOIL MAPPING - FOOTPRINT (WITHOUT CRANE PATH)

- HND - HUGHENDEN
- ZDL - DISTURBED LAND



NOTE(S)

1. FOLLOW WETLAND MITIGATION MEASURES AND APPROVAL.
2. ALL POLYGONS WITH THIS SPECIAL STOCKPILING REQUIREMENT ARE PRESUMED TO BE SALT-AFFECTED; TOPSOIL FROM THESE POLYGONS CAN BE STOCKPILED TOGETHER, BUT MUST BE STOCKPILED SEPARATELY FROM POLYGONS WITHOUT THIS SPECIAL STOCKPILING REQUIREMENT.
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 PROJECTION: UTM ZONE 12 DATUM: NAD 83

CLIENT

Capital Power

PROJECT

HALKIRK 2 WIND POWER PROJECT

TITLE

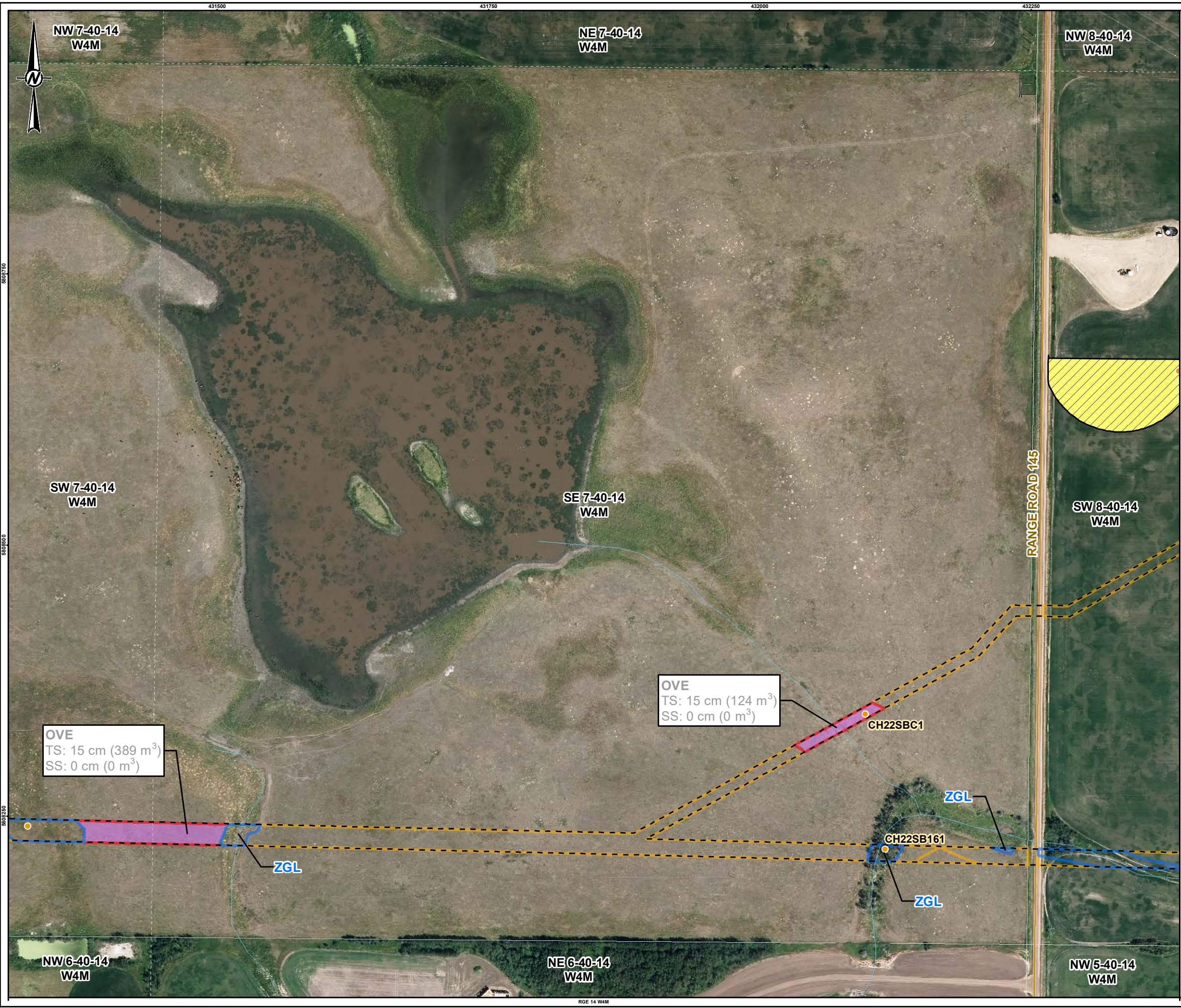
**SOIL MAP UNITS WITHIN THE PROJECT FOOTPRINT
NE 7-40-14 W4M**

CONSULTANT	YYYY-MM-DD	2023-09-15
	DESIGNED	SC
	PREPARED	LB/NB
	REVIEWED	LS
	APPROVED	SC

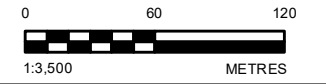
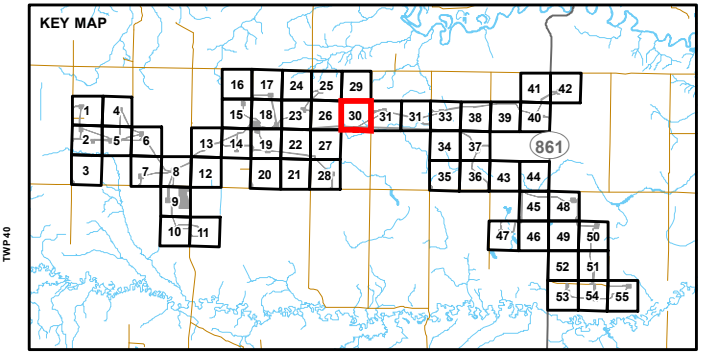
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IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B
 20mm



- LEGEND**
- 2022 SOIL INSPECTION SITE
 - LOCAL ROAD
 - WATERCOURSE
 - FOOTPRINT BOUNDARY**
 - FOOTPRINT (WITHOUT CRANE PATH)
 - - - UNDERGROUND COLLECTOR SYSTEM
 - TS TOPSOIL STRIPPING DEPTH AND VOLUME
 - SS SUBSOIL STRIPPING DEPTH AND VOLUME
 - /// TOPSOIL AND SUBSOIL STRIPPING
 - SPECIAL SOIL STRIPPING AND WINDROWING REQUIREMENTS - UNDERGROUND COLLECTION SYSTEM**
 - NO SOIL STRIPPING – FOLLOW WETLAND MITIGATION MEASURES AND APPROVAL
 - STRIP AND WINDROW TOPSOIL ONLY³
 - NO SOIL STRIPPING
 - SOIL MAPPING - FOOTPRINT (WITHOUT CRANE PATH)**
 - HND - HUGHENDEN
 - SOIL MAPPING - UNDERGROUND COLLECTION SYSTEM**
 - OVE - ONNEVUE



NOTE(S)

- FOLLOW WETLAND MITIGATION MEASURES AND APPROVAL.
- ALL POLYGONS WITH THIS SPECIAL STOCKPILING REQUIREMENT ARE PRESUMED TO BE SALT-AFFECTED; TOPSOIL FROM THESE POLYGONS CAN BE STOCKPILED TOGETHER, BUT MUST BE STOCKPILED SEPARATELY FROM POLYGONS WITHOUT THIS SPECIAL STOCKPILING REQUIREMENT.
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 PROJECTION: UTM ZONE 12 DATUM: NAD 83

CLIENT

Capital Power

PROJECT

HALKIRK 2 WIND POWER PROJECT

TITLE

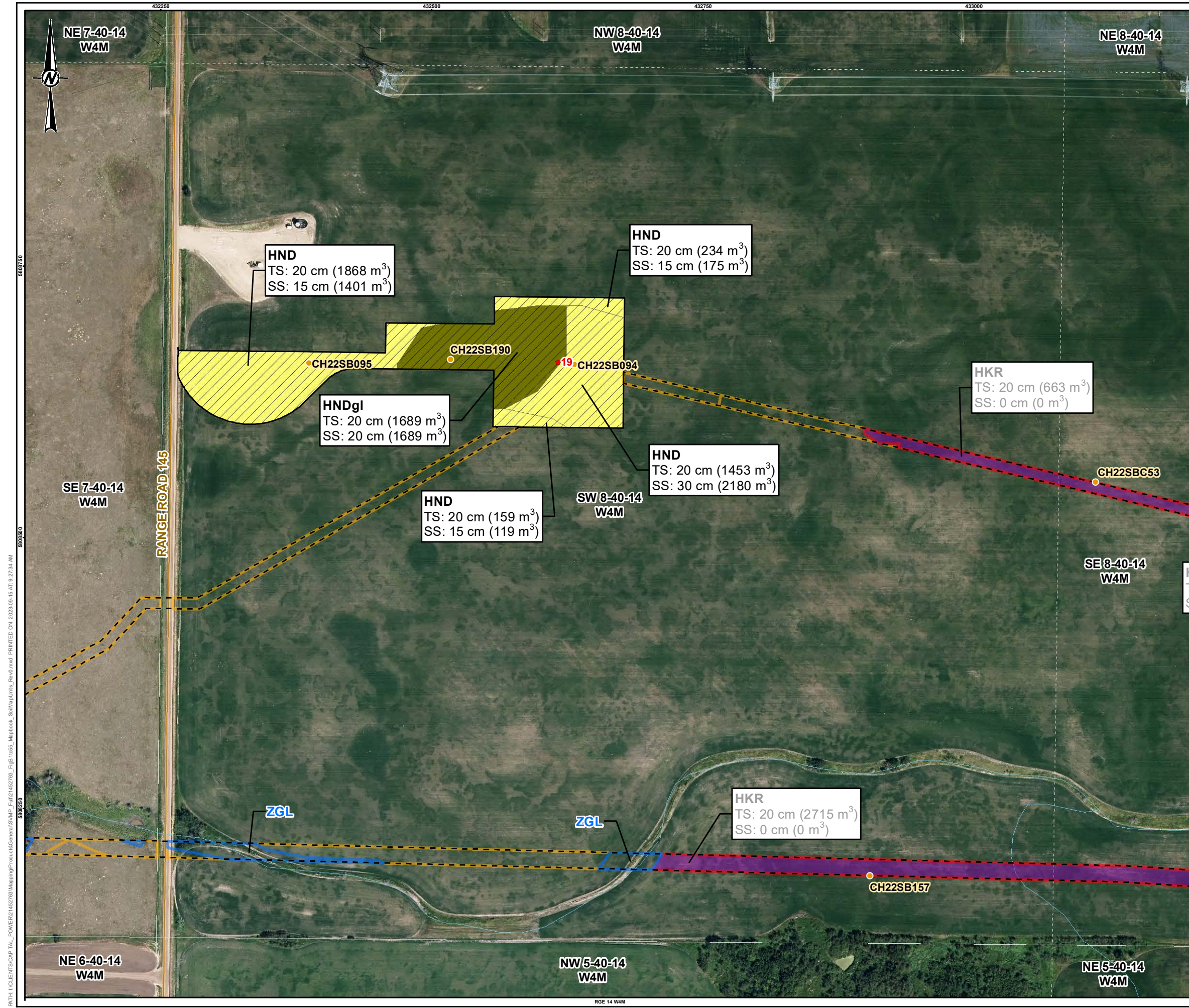
SOIL MAP UNITS WITHIN THE PROJECT FOOTPRINT
 SE 7-40-14 W4M

CONSULTANT	YYYY-MM-DD	2023-09-15
DESIGNED	SC	
PREPARED	LB/NB	
REVIEWED	LS	
APPROVED	SC	

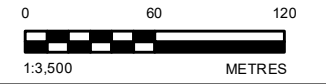
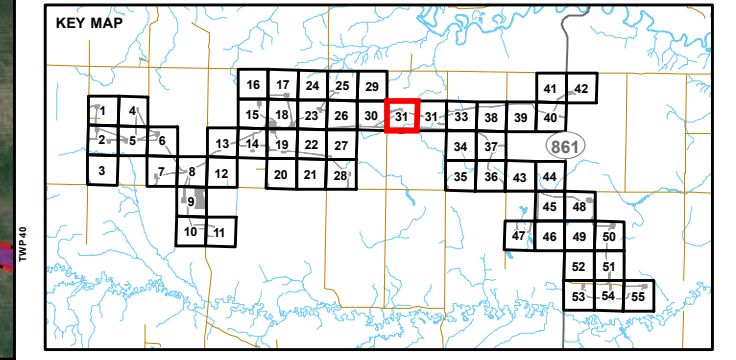
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IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B



- LEGEND**
- 2022 SOIL INSPECTION SITE
 - TURBINE
 - LOCAL ROAD
 - WATERCOURSE
 - FOOTPRINT (WITHOUT CRANE PATH)
 - UNDERGROUND COLLECTOR SYSTEM
 - TS TOPSOIL STRIPPING DEPTH AND VOLUME
 - SS SUBSOIL STRIPPING DEPTH AND VOLUME
 - /// TOPSOIL AND SUBSOIL
 - SPECIAL SOIL STRIPPING AND WINDROWING REQUIREMENTS - UNDERGROUND COLLECTION SYSTEM
 - NO SOIL STRIPPING - FOLLOW WETLAND MITIGATION MEASURES AND APPROVAL
 - STRIP AND WINDROW TOPSOIL ONLY³
 - NO SOIL STRIPPING
- SOIL MAPPING - FOOTPRINT (WITHOUT CRANE PATH)**
- HND - HUGHENDEN
 - HNDgl - HUGHENDEN-
- SOIL MAPPING - UNDERGROUND COLLECTION SYSTEM**
- HKR - HALKIRK



- NOTE(S)**
1. FOLLOW WETLAND MITIGATION MEASURES AND APPROVAL.
 2. ALL POLYGONS WITH THIS SPECIAL STOCKPILING REQUIREMENT ARE PRESUMED TO BE SALT-AFFECTED; TOPSOIL FROM THESE POLYGONS CAN BE STOCKPILED TOGETHER, BUT MUST BE STOCKPILED SEPARATELY FROM POLYGONS WITHOUT THIS SPECIAL STOCKPILING REQUIREMENT.
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 PROJECTION: UTM ZONE 12 DATUM: NAD 83

CLIENT

Capital Power

PROJECT
 HALKIRK 2 WIND POWER PROJECT

TITLE
 SOIL MAP UNITS WITHIN THE PROJECT FOOTPRINT
 SW 8-40-14 W4M

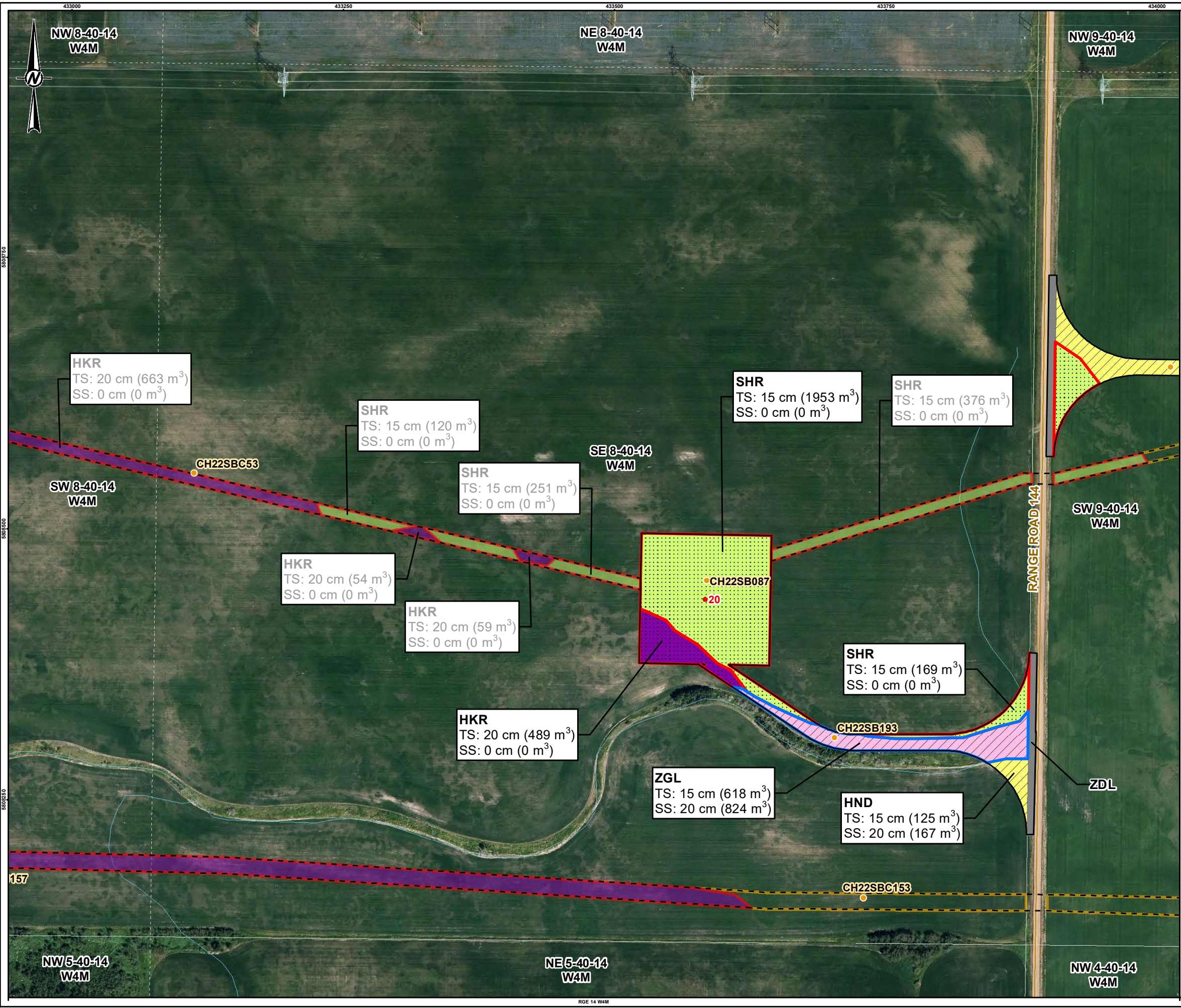
CONSULTANT

YYYY-MM-DD	2023-09-15
DESIGNED	SC
PREPARED	LB/NB
REVIEWED	LS
APPROVED	SC

PROJECT NO. 21452763 CONTROL REV. 0 FIGURE B-31

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IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B



LEGEND

- 2022 SOIL INSPECTION SITE
- TURBINE
- LOCAL ROAD
- WATERCOURSE

FOOTPRINT BOUNDARY

- FOOTPRINT (WITHOUT CRANE PATH)
- UNDERGROUND COLLECTOR SYSTEM

TS TOPSOIL STRIPPING DEPTH AND VOLUME

SS SUBSOIL STRIPPING DEPTH AND VOLUME

- TOPSOIL STRIPPING ONLY
- TOPSOIL AND SUBSOIL

SPECIAL STOCKPILING REQUIREMENTS - FOOTPRINT WITHOUT CRANE PATH

- STOCKPILE WETLAND TOPSOIL AND SUBSOIL SEPARATE FROM NON-WETLAND TOPSOIL AND SUBSOIL¹
- STOCKPILE TOPSOIL SEPARATELY FROM NON-SALT AFFECTED SOIL MAP UNITS²

SPECIAL SOIL STRIPPING AND WINDROWING REQUIREMENTS - UNDERGROUND COLLECTION SYSTEM

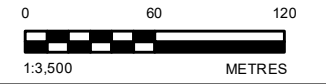
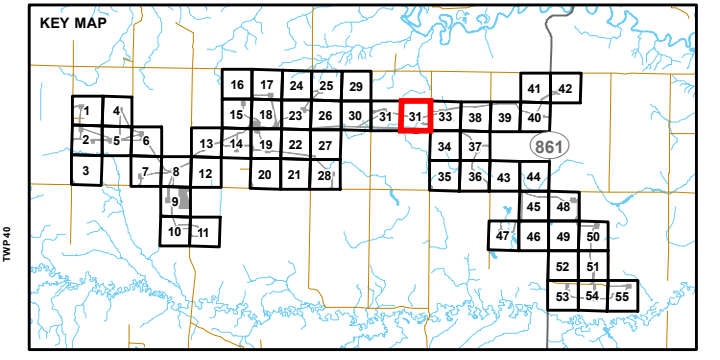
- STRIP AND WINDROW TOPSOIL ONLY³
- NO SOIL STRIPPING

SOIL MAPPING - FOOTPRINT (WITHOUT CRANE PATH)

- HKR - HALKIRK
- HND - HUGHENDEN
- SHR - SHEERNESS
- ZDL - DISTURBED LAND
- ZGL - MISCELLANEOUS GLEYSOL

SOIL MAPPING - UNDERGROUND COLLECTION SYSTEM

- HKR - HALKIRK
- SHR - SHEERNESS



NOTE(S)

1. FOLLOW WETLAND MITIGATION MEASURES AND APPROVAL.
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 PROJECTION: UTM ZONE 12 DATUM: NAD 83

CLIENT

Capital Power

PROJECT
HALKIRK 2 WIND POWER PROJECT

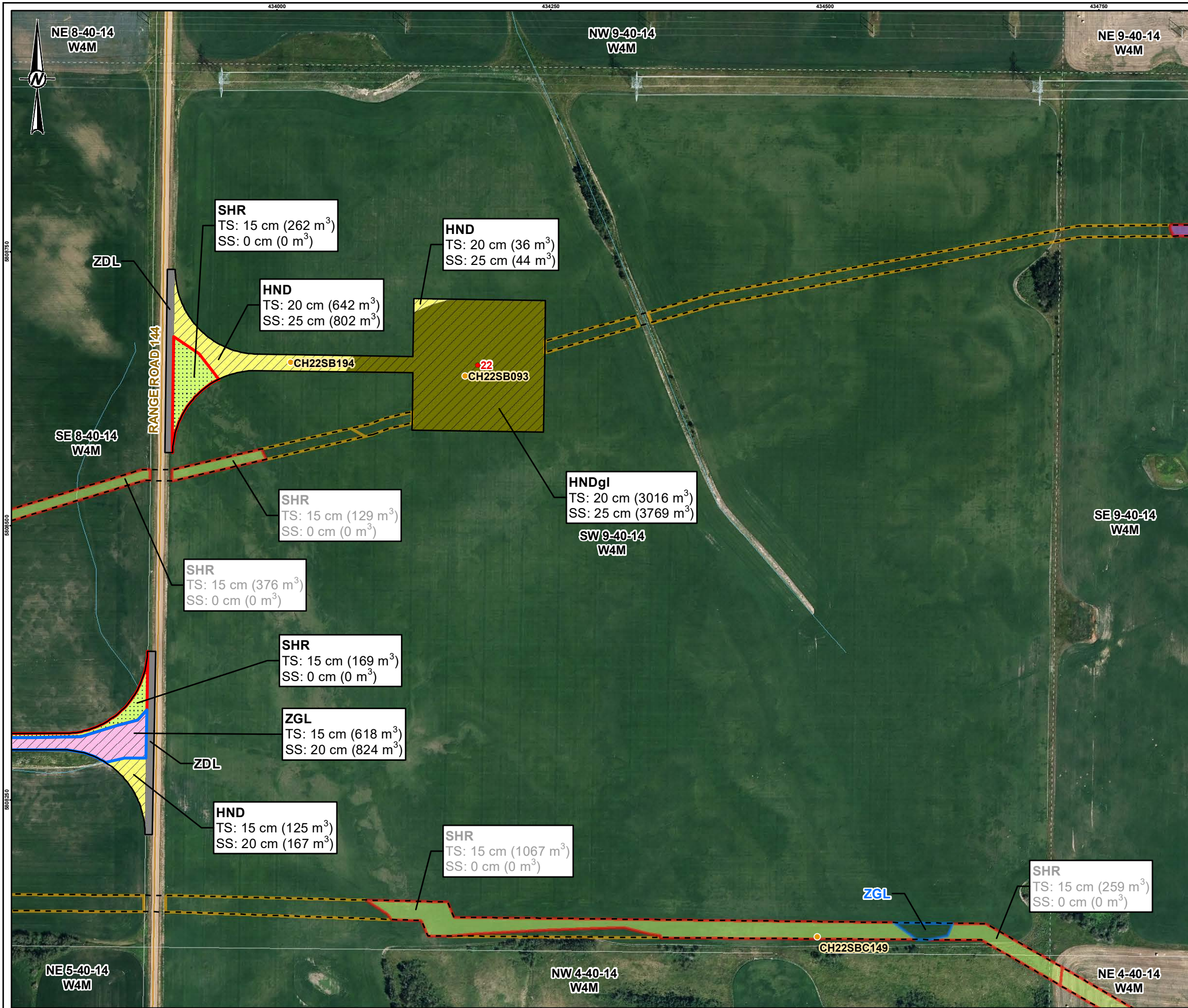
TITLE
SOIL MAP UNITS WITHIN THE PROJECT FOOTPRINT SE 8-40-14 W4M

CONSULTANT

YYYY-MM-DD	2023-09-15
DESIGNED	SC
PREPARED	LB/NB
REVIEWED	LS
APPROVED	SC

PROJECT NO. 21452763 CONTROL REV. 0 FIGURE B-32

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LEGEND

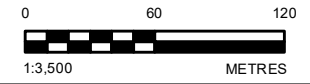
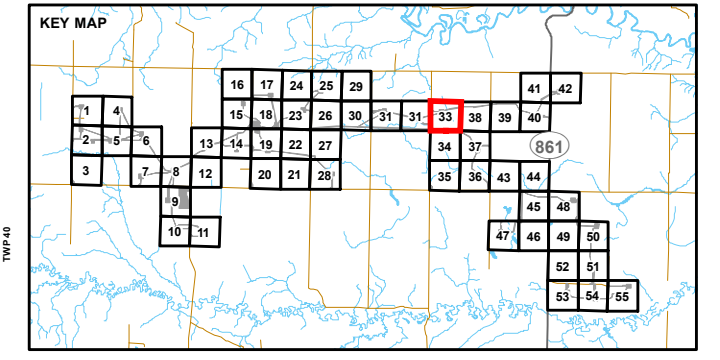
- 2022 SOIL INSPECTION SITE
- TURBINE
- LOCAL ROAD
- WATERCOURSE
- FOOTPRINT BOUNDARY
- FOOTPRINT (WITHOUT CRANE PATH)
- UNDERGROUND COLLECTOR SYSTEM
- TS TOPSOIL STRIPPING DEPTH AND VOLUME
- SS SUBSOIL STRIPPING DEPTH AND VOLUME
- TOPSOIL STRIPPING ONLY
- TOPSOIL AND SUBSOIL
- SPECIAL STOCKPILING REQUIREMENTS - FOOTPRINT WITHOUT CRANE PATH**
- STOCKPILE WETLAND TOPSOIL AND SUBSOIL SEPARATE FROM NON-WETLAND TOPSOIL AND SUBSOIL¹
- STOCKPILE TOPSOIL SEPARATELY FROM NON-SALT AFFECTED SOIL MAP UNITS²
- SPECIAL SOIL STRIPPING AND WINDROWING REQUIREMENTS - UNDERGROUND COLLECTION SYSTEM**
- NO SOIL STRIPPING - FOLLOW WETLAND MITIGATION MEASURES AND APPROVAL
- STRIP AND WINDROW TOPSOIL ONLY³
- NO SOIL STRIPPING

SOIL MAPPING - FOOTPRINT (WITHOUT CRANE PATH)

- HND - HUGHENDEN
- HNDgl - HUGHENDEN-GLEYED
- SHR - SHEERNESS
- ZDL - DISTURBED LAND
- ZGL - MISCELLANEOUS GLEYSOL

SOIL MAPPING - UNDERGROUND COLLECTION SYSTEM

- OVE - ONNEVUE
- SHR - SHEERNESS



NOTE(S)

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 PROJECTION: UTM ZONE 12 DATUM: NAD 83

CLIENT
Capital Power

PROJECT
 HALKIRK 2 WIND POWER PROJECT

TITLE
SOIL MAP UNITS WITHIN THE PROJECT FOOTPRINT SW 9-40-14 W4M

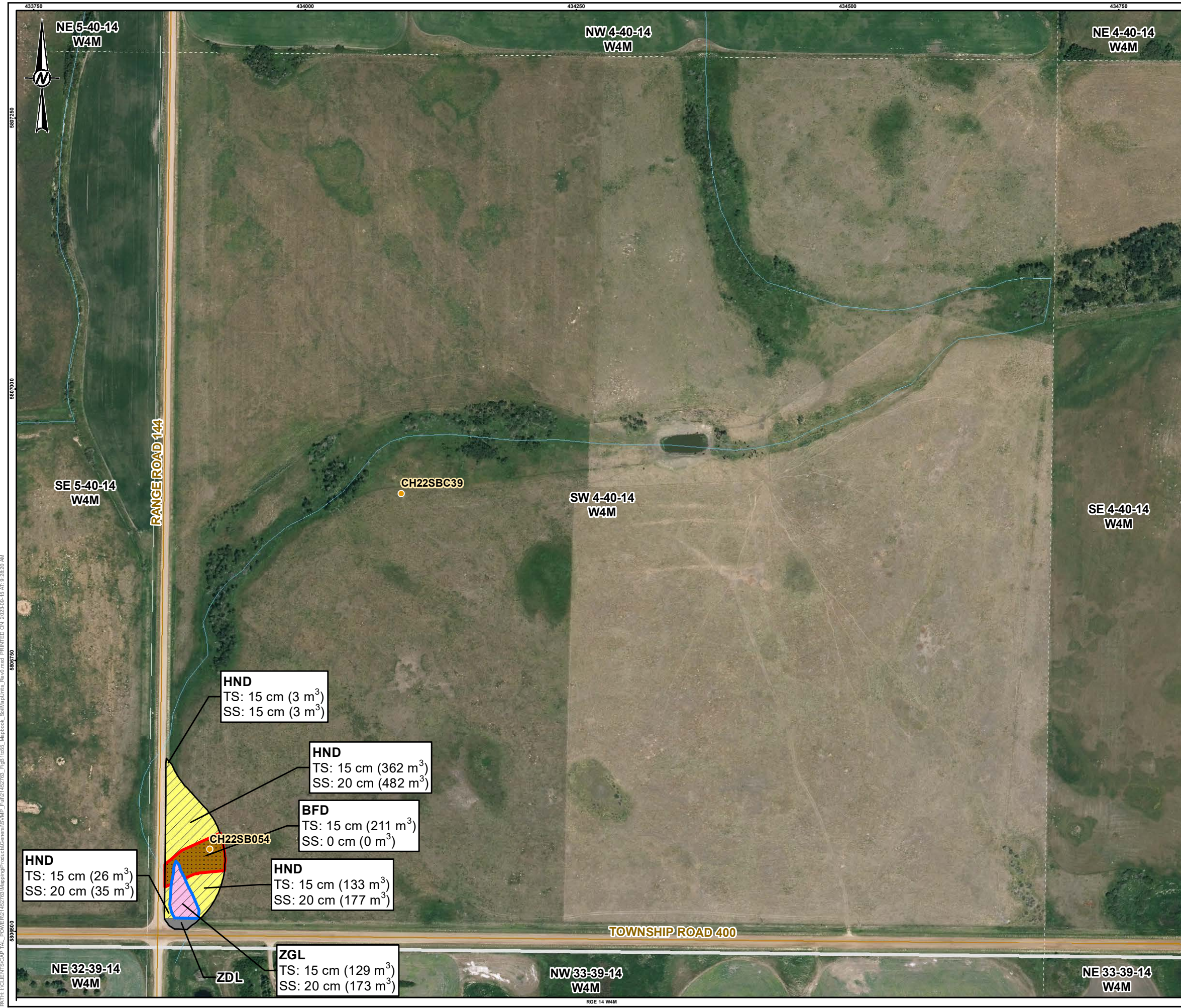
CONSULTANT

YYYY-MM-DD	2023-09-15
DESIGNED	SC
PREPARED	LB/NB
REVIEWED	LS
APPROVED	SC

PROJECT NO. 21452763 CONTROL REV. 0 FIGURE B-33

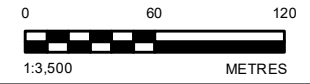
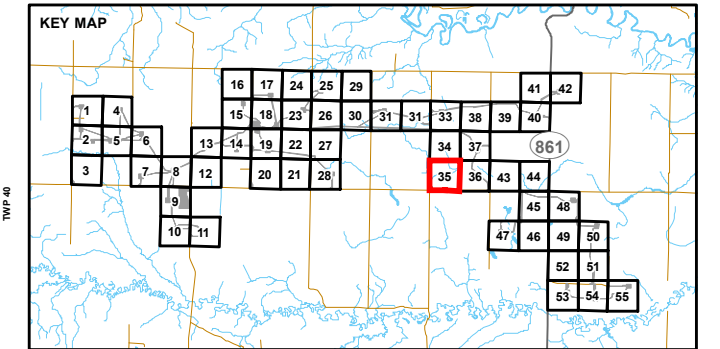
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IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B
 20mm



LEGEND

- 2022 SOIL INSPECTION SITE
- LOCAL ROAD
- WATERCOURSE
- FOOTPRINT (WITHOUT CRANE PATH)
- UNDERGROUND COLLECTOR SYSTEM
- TS TOPSOIL STRIPPING DEPTH AND VOLUME
- SS SUBSOIL STRIPPING DEPTH AND VOLUME
- ⋯ TOPSOIL STRIPPING
- /// TOPSOIL AND SUBSOIL
- SPECIAL STOCKPILING REQUIREMENTS - FOOTPRINT WITHOUT CRANE PATH**
- STOCKPILE WETLAND TOPSOIL AND SUBSOIL SEPARATE FROM NON-WETLAND TOPSOIL AND SUBSOIL¹
- STOCKPILE TOPSOIL SEPARATELY FROM NON-SALT AFFECTED SOIL MAP UNITS²
- SOIL MAPPING - FOOTPRINT (WITHOUT CRANE PATH)**
- BFD - BROWNFIELD
- HND - HUGHENDEN
- ZDL - DISTURBED
- ZGL - MISCELLANEOUS GLEYSOL



NOTE(S)

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 PROJECTION: UTM ZONE 12 DATUM: NAD 83

CLIENT

Capital Power

PROJECT

HALKIRK 2 WIND POWER PROJECT

TITLE

**SOIL MAP UNITS WITHIN THE PROJECT FOOTPRINT
SW 4-40-14 W4M**

CONSULTANT	YYYY-MM-DD	2023-09-15
	DESIGNED	SC
	PREPARED	LB/NB
	REVIEWED	LS
	APPROVED	SC

PROJECT NO.	CONTROL	REV.	FIGURE
21452763		0	B-35

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IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B



SHR
TS: 20 cm (729 m³)
SS: 0 cm (0 m³)

BFD
TS: 20 cm (2097 m³)
SS: 0 cm (0 m³)

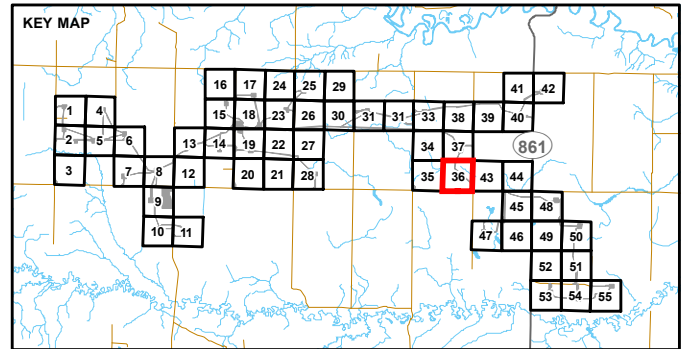
ZGL
TS: 20 cm (128 m³)
SS: 30 cm (192 m³)

ZGL
TS: 20 cm (173 m³)
SS: 30 cm (260 m³)

ZGL
TS: 20 cm (9 m³)
SS: 30 cm (14 m³)

LEGEND

● 2022 SOIL INSPECTION SITE	SOIL MAPPING - FOOTPRINT (WITHOUT CRANE PATH)
— LOCAL ROAD	■ ZDL - DISTURBED LAND
— WATERCOURSE	■ ZGL - MISCELLANEOUS GLEYSOL
FOOTPRINT BOUNDARY	SOIL MAPPING - UNDERGROUND COLLECTION SYSTEM
□ FOOTPRINT (WITHOUT CRANE PATH)	■ BFD - BROWNFIELD
□ UNDERGROUND COLLECTOR SYSTEM	■ SHR - SHEERNESS
TS TOPSOIL STRIPPING DEPTH AND VOLUME	
SS SUBSOIL STRIPPING DEPTH AND VOLUME	
TOPSOIL AND SUBSOIL	
SPECIAL STOCKPILING REQUIREMENTS - FOOTPRINT WITHOUT CRANE PATH	
□ STOCKPILE WETLAND TOPSOIL AND SUBSOIL SEPARATE FROM NON-WETLAND TOPSOIL AND SUBSOIL ¹	
SPECIAL SOIL STRIPPING AND WINDROWING REQUIREMENTS - UNDERGROUND COLLECTION SYSTEM	
□ NO SOIL STRIPPING - FOLLOW WETLAND MITIGATION MEASURES AND APPROVAL	
□ STRIP AND WINDROW TOPSOIL ONLY ³	



NOTE(S)

1. FOLLOW WETLAND MITIGATION MEASURES AND APPROVAL.
2. ALL POLYGONS WITH THIS SPECIAL STOCKPILING REQUIREMENT ARE PRESUMED TO BE SALT-AFFECTED; TOPSOIL FROM THESE POLYGONS CAN BE STOCKPILED TOGETHER, BUT MUST BE STOCKPILED SEPARATELY FROM POLYGONS WITHOUT THIS SPECIAL STOCKPILING REQUIREMENT.
3. IN CULTIVATED LANDS WHERE SALT-AFFECTED SOILS HAVE BEEN IDENTIFIED, IT IS RECOMMENDED THAT TOPSOIL WILL BE SALVAGED AND WINDROWED PRIOR TO PLOUGHING IN COLLECTOR LINES DURING PERIODS OF FROZEN GROUND CONDITIONS TO AVOID MIXING SALT-AFFECTED UPPER SUBSOIL INTO TOPSOIL.

REFERENCE(S)
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PROJECTION: UTM ZONE 12 DATUM: NAD 83

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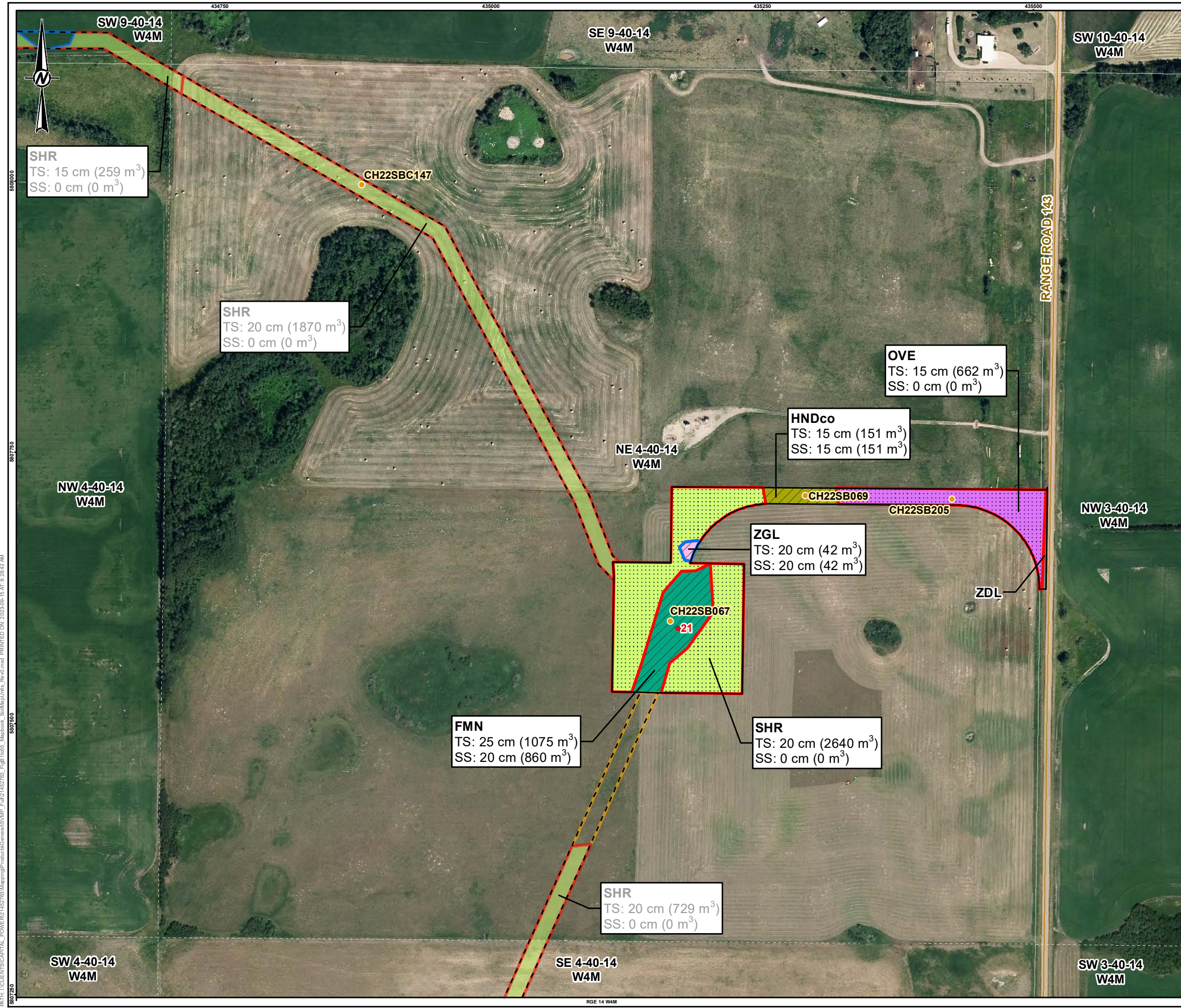
Capital Power

PROJECT
HALKIRK 2 WIND POWER PROJECT

TITLE
SOIL MAP UNITS WITHIN THE PROJECT FOOTPRINT SE 4-40-14 W4M

CONSULTANT	YYYY-MM-DD	2023-09-15
	DESIGNED	SC
	PREPARED	LB/NB
	REVIEWED	LS
	APPROVED	SC

PROJECT NO. 21452763 CONTROL REV. 0 FIGURE B-36



LEGEND

- 2022 SOIL INSPECTION SITE
- TURBINE
- LOCAL ROAD
- FOOTPRINT (WITHOUT CRANE PATH)
- - - UNDERGROUND COLLECTOR SYSTEM
- TS TOPSOIL STRIPPING DEPTH AND VOLUME
- SS SUBSOIL STRIPPING DEPTH AND VOLUME
- ⋯ TOPSOIL STRIPPING ONLY
- /// TOPSOIL AND SUBSOIL

SOIL MAPPING - FOOTPRINT (WITHOUT CRANE PATH)

- FMN - FOREMAN
- HNDco - HUGHENDEN-COARSE
- OVE - ONNEVUE
- SHR - SHEERNESS
- ZDL - DISTURBED LAND
- ZGL - MISCELLANEOUS GLEYSOL

SOIL MAPPING - UNDERGROUND COLLECTION SYSTEM

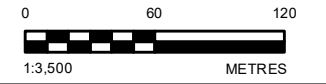
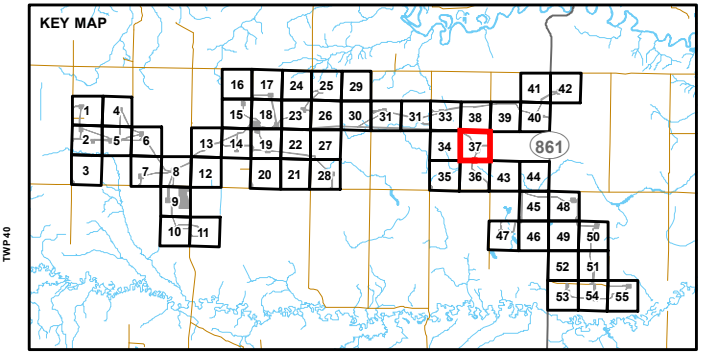
- SHR - SHEERNESS

SPECIAL STOCKPILING REQUIREMENTS - FOOTPRINT WITHOUT CRANE PATH

- STOCKPILE WETLAND TOPSOIL AND SUBSOIL SEPARATE FROM NON-WETLAND TOPSOIL AND SUBSOIL¹
- STOCKPILE TOPSOIL SEPARATELY FROM NON-SALT AFFECTED SOIL MAP UNITS²

SPECIAL SOIL STRIPPING AND WINDROWING REQUIREMENTS - UNDERGROUND COLLECTION SYSTEM

- NO SOIL STRIPPING - FOLLOW WETLAND MITIGATION MEASURES AND APPROVAL
- STRIP AND WINDROW TOPSOIL ONLY³
- NO SOIL STRIPPING



NOTE(S)

1. FOLLOW WETLAND MITIGATION MEASURES AND APPROVAL.
2. ALL POLYGONS WITH THIS SPECIAL STOCKPILING REQUIREMENT ARE PRESUMED TO BE SALT-AFFECTED; TOPSOIL FROM THESE POLYGONS CAN BE STOCKPILED TOGETHER, BUT MUST BE STOCKPILED SEPARATELY FROM POLYGONS WITHOUT THIS SPECIAL STOCKPILING REQUIREMENT.
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 PROJECTION: UTM ZONE 12 DATUM: NAD 83

CLIENT

Capital Power

PROJECT
 HALKIRK 2 WIND POWER PROJECT

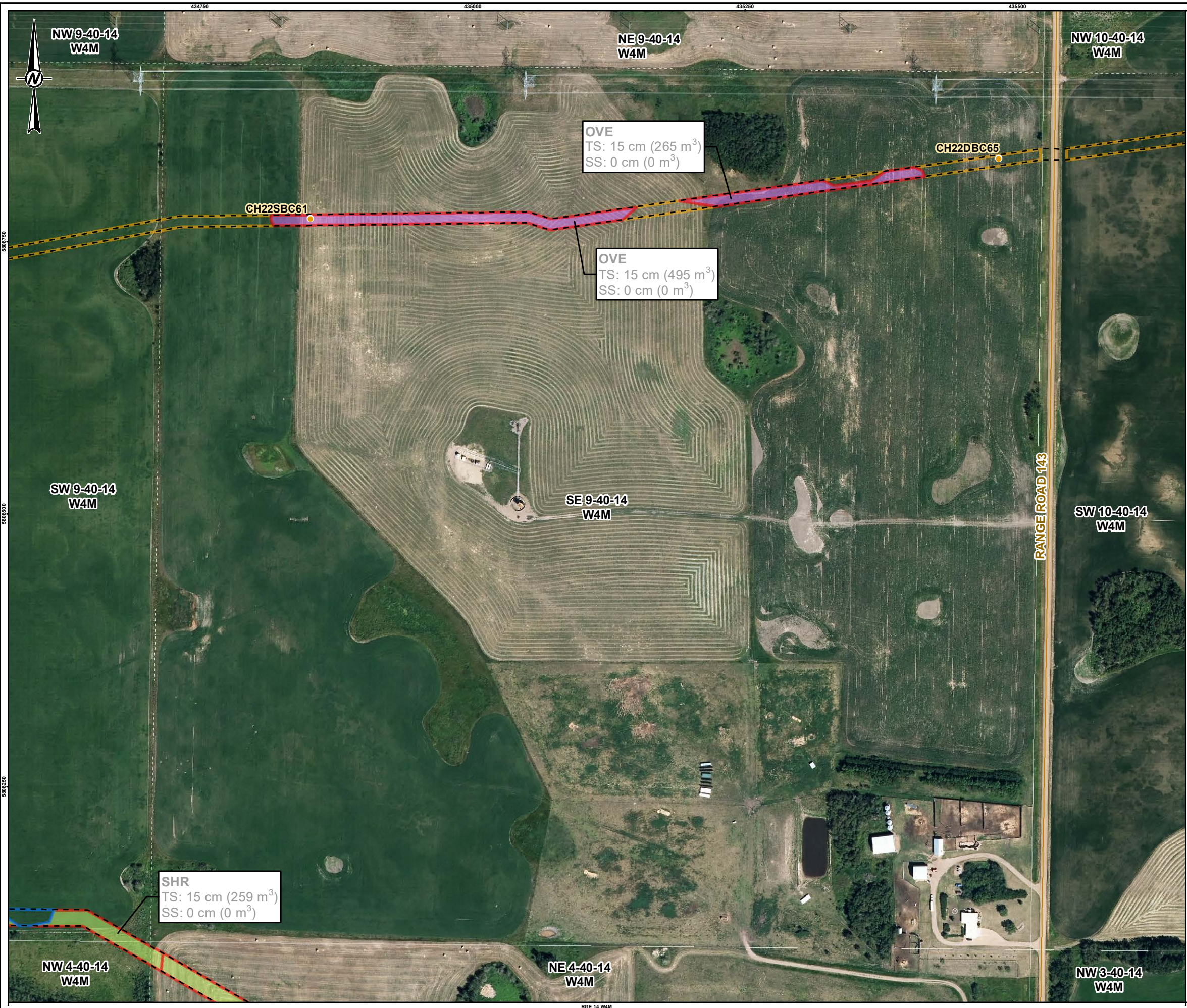
TITLE
 SOIL MAP UNITS WITHIN THE PROJECT FOOTPRINT
 NE 4-40-14 W4M

CONSULTANT	YYYY-MM-DD	2023-09-15
DESIGNED	SC	
PREPARED	LB/NB	
REVIEWED	LS	
APPROVED	SC	

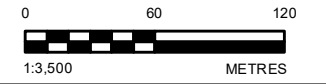
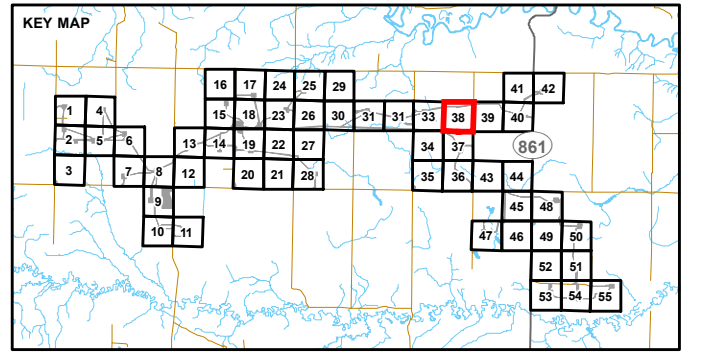
PROJECT NO. 21452763 CONTROL REV. 0 FIGURE B-37

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IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B
 26mm



- LEGEND**
- 2022 SOIL INSPECTION SITE
 - LOCAL ROAD
 - FOOTPRINT BOUNDARY
 - FOOTPRINT (WITHOUT CRANE PATH)
 - - - UNDERGROUND COLLECTOR SYSTEM
 - TS TOPSOIL STRIPPING DEPTH AND VOLUME
 - SS SUBSOIL STRIPPING DEPTH AND VOLUME
 - SPECIAL SOIL STRIPPING AND WINDROWING REQUIREMENTS - UNDERGROUND COLLECTION SYSTEM
 - NO SOIL STRIPPING – FOLLOW WETLAND MITIGATION MEASURES AND APPROVAL
 - STRIP AND WINDROW TOPSOIL ONLY³
 - NO SOIL STRIPPING
 - SOIL MAPPING - UNDERGROUND COLLECTION SYSTEM
 - OVE - ONNEVUE
 - SHR - SHEERNESS



- NOTE(S)**
1. FOLLOW WETLAND MITIGATION MEASURES AND APPROVAL.
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 PROJECTION: UTM ZONE 12 DATUM: NAD 83

CLIENT
Capital Power

PROJECT
 HALKIRK 2 WIND POWER PROJECT

TITLE
**SOIL MAP UNITS WITHIN THE PROJECT FOOTPRINT
 SE 9-40-14 W4M**

CONSULTANT

YYYY-MM-DD	2023-09-15
DESIGNED	SC
PREPARED	LB/NB
REVIEWED	LS
APPROVED	SC

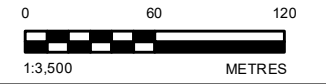
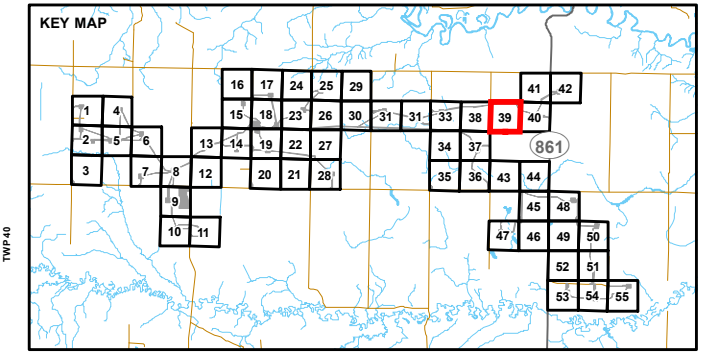
PROJECT NO. CONTROL REV. FIGURE
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IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B
 26mm



- LEGEND**
- 2022 SOIL INSPECTION SITE
 - LOCAL ROAD
 - FOOTPRINT**
 - FOOTPRINT (WITHOUT CRANE PATH)
 - - - UNDERGROUND COLLECTOR SYSTEM
 - TS TOPSOIL STRIPPING DEPTH AND VOLUME
 - SS SUBSOIL STRIPPING DEPTH AND VOLUME
 - SPECIAL SOIL STRIPPING AND WINDROWING REQUIREMENTS - UNDERGROUND COLLECTION SYSTEM**
 - NO SOIL STRIPPING – FOLLOW WETLAND MITIGATION MEASURES AND APPROVAL
 - STRIP AND WINDROW TOPSOIL ONLY³
 - NO SOIL STRIPPING
 - SOIL MAPPING - UNDERGROUND COLLECTION SYSTEM**
 - OVE - ONNEVUE



- NOTE(S)**
1. FOLLOW WETLAND MITIGATION MEASURES AND APPROVAL.
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 PROJECTION: UTM ZONE 12 DATUM: NAD 83

CLIENT

Capital Power

PROJECT
 HALKIRK 2 WIND POWER PROJECT

TITLE
SOIL MAP UNITS WITHIN THE PROJECT FOOTPRINT
 SW 10-40-14 W4M

CONSULTANT	YYYY-MM-DD	2023-09-15
	DESIGNED	SC
	PREPARED	LB/NB
	REVIEWED	LS
	APPROVED	SC

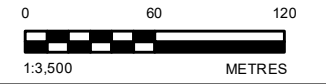
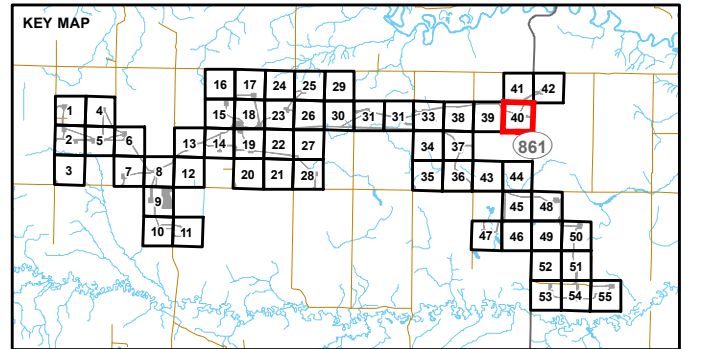
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IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B
 20mm



- LEGEND**
- 2022 SOIL INSPECTION SITE
 - TURBINE
 - SECONDARY HIGHWAY
 - FOOTPRINT BOUNDARY
 - FOOTPRINT (WITHOUT CRANE PATH)
 - UNDERGROUND COLLECTOR SYSTEM
 - TS TOPSOIL STRIPPING DEPTH AND VOLUME
 - SS SUBSOIL STRIPPING DEPTH AND VOLUME
 - /// TOPSOIL AND SUBSOIL STRIPPING
 - SPECIAL STOCKPILING REQUIREMENTS - FOOTPRINT WITHOUT CRANE PATH
 - STOCKPILE WETLAND TOPSOIL AND SUBSOIL SEPARATE FROM NON-WETLAND TOPSOIL AND SUBSOIL¹
 - SPECIAL SOIL STRIPPING AND WINDROWING REQUIREMENTS - UNDERGROUND COLLECTION SYSTEM
 - NO SOIL STRIPPING
- SOIL MAPPING - FOOTPRINT (WITHOUT CRANE PATH)**
- HND - HUGHENDEN
 - HNDca - HUGHENDEN-CALCAREOUS
 - HNDco - HUGHENDEN-COARSE
 - ZDL - DISTURBED LAND
 - ZGL - MISCELLANEOUS GLEYSOL



NOTE(S)

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 PROJECTION: UTM ZONE 12 DATUM: NAD 83

CLIENT
Capital Power

PROJECT
HALKIRK 2 WIND POWER PROJECT

TITLE
**SOIL MAP UNITS WITHIN THE PROJECT FOOTPRINT
 SE 10-40-14 W4M**

CONSULTANT

YYYY-MM-DD	2023-09-15
DESIGNED	SC
PREPARED	LB/NB
REVIEWED	LS
APPROVED	SC

PROJECT NO. CONTROL REV. FIGURE
 21452763 0 B-40



LEGEND

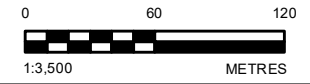
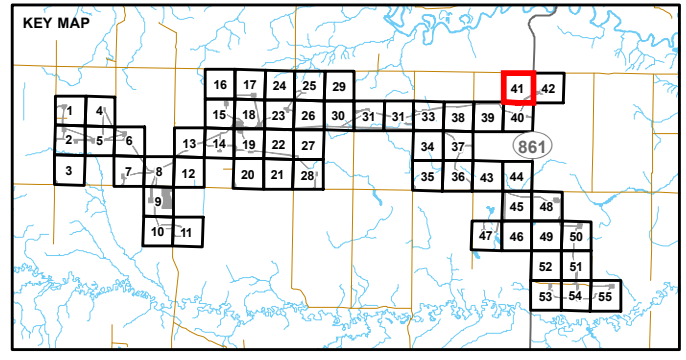
- 2022 SOIL INSPECTION SITE
- SECONDARY HIGHWAY
- LOCAL ROAD
- FOOTPRINT BOUNDARY
- FOOTPRINT (WITHOUT CRANE PATH)
- - - UNDERGROUND COLLECTOR SYSTEM
- TS TOPSOIL STRIPPING DEPTH AND VOLUME
- SS SUBSOIL STRIPPING DEPTH AND VOLUME
- /// TOPSOIL AND SUBSOIL

SOIL MAPPING - FOOTPRINT (WITHOUT CRANE PATH)

- HND - HUGHENDEN
- ZDL - DISTURBED LAND

SPECIAL SOIL STRIPPING AND WINDROWING REQUIREMENTS - UNDERGROUND COLLECTION SYSTEM

- NO SOIL STRIPPING - FOLLOW WETLAND MITIGATION MEASURES AND APPROVAL
- NO SOIL STRIPPING



NOTE(S)

1. FOLLOW WETLAND MITIGATION MEASURES AND APPROVAL.
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PROJECTION: UTM ZONE 12 DATUM: NAD 83

CLIENT

Capital Power

PROJECT
HALKIRK 2 WIND POWER PROJECT

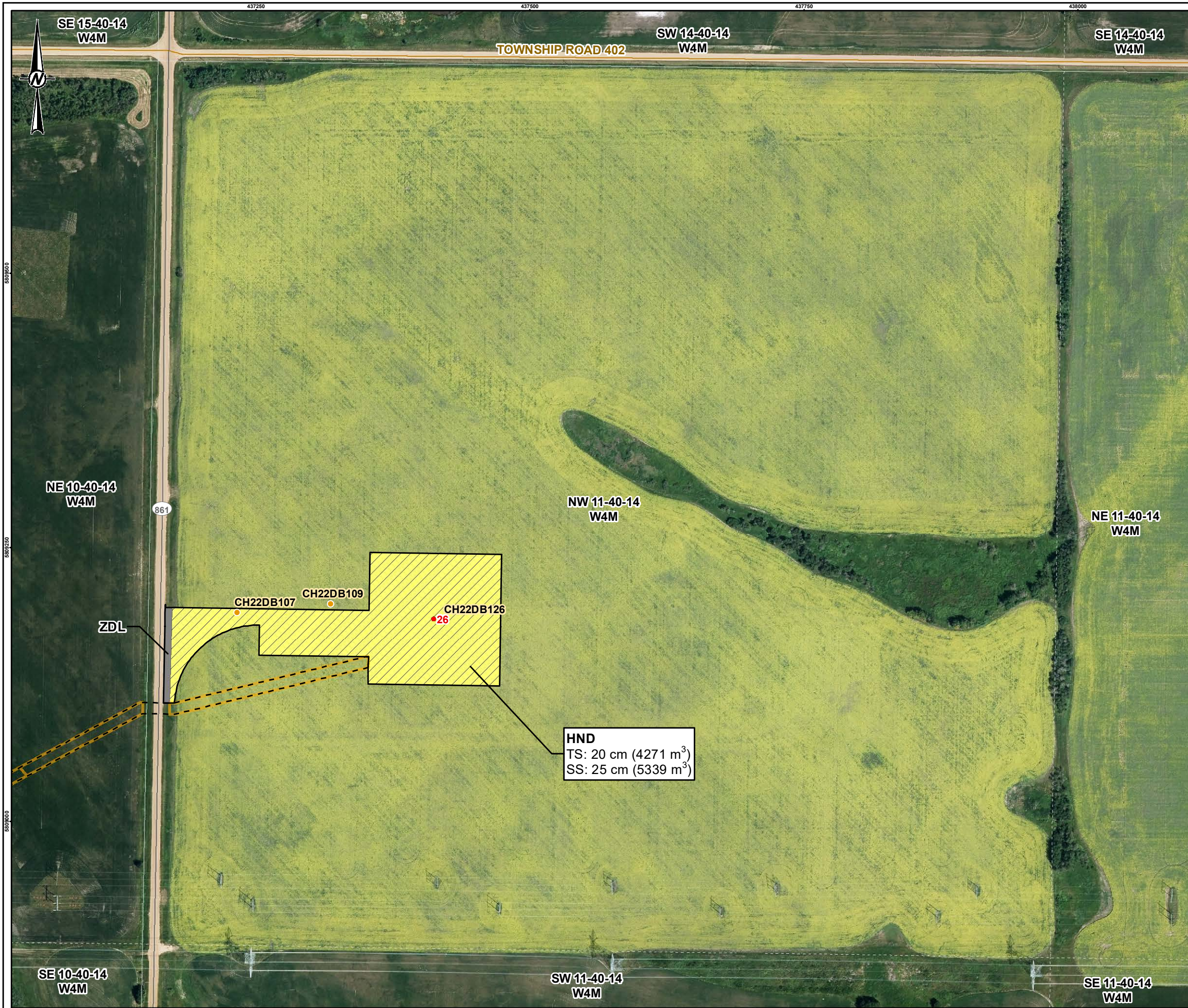
TITLE
**SOIL MAP UNITS WITHIN THE PROJECT FOOTPRINT
NE 10-40-14 W4M**

CONSULTANT	YYYY-MM-DD	2023-09-15
	DESIGNED	SC
	PREPARED	LB/NB
	REVIEWED	LS
	APPROVED	SC

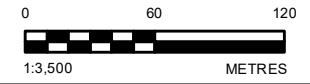
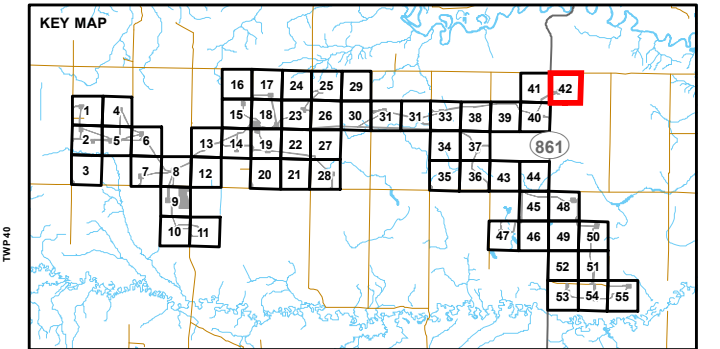
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IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B



- LEGEND**
- 2022 SOIL INSPECTION SITE
 - TURBINE
 - SECONDARY HIGHWAY
 - LOCAL ROAD
- SOIL MAPPING - FOOTPRINT (WITHOUT CRANE PATH)**
- HND - HUGENDEN
 - ZDL - DISTURBED LAND
- FOOTPRINT BOUNDARY**
- FOOTPRINT (WITHOUT CRANE PATH)
 - - - UNDERGROUND COLLECTOR SYSTEM
- TS TOPSOIL STRIPPING DEPTH AND VOLUME**
- SS SUBSOIL STRIPPING DEPTH AND VOLUME**
- /// TOPSOIL AND SUBSOIL
- SPECIAL SOIL STRIPPING AND WINDROWING REQUIREMENTS - UNDERGROUND COLLECTION SYSTEM**
- NO SOIL STRIPPING



- NOTE(S)**
1. FOLLOW WETLAND MITIGATION MEASURES AND APPROVAL.
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PROJECTION: UTM ZONE 12 DATUM: NAD 83

CLIENT



PROJECT
HALKIRK 2 WIND POWER PROJECT

TITLE
SOIL MAP UNITS WITHIN THE PROJECT FOOTPRINT
NW 11-40-14 W4M

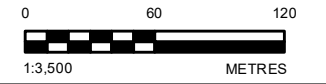
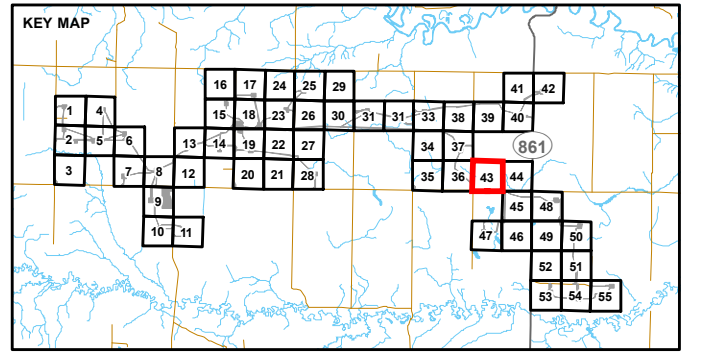
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	DESIGNED SC
	PREPARED LB/NB
	REVIEWED LS
	APPROVED SC

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IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B



- LEGEND**
- LOCAL ROAD
 - WATERCOURSE
 - FOOTPRINT BOUNDARY**
 - FOOTPRINT (WITHOUT CRANE PATH)
 - UNDERGROUND COLLECTOR SYSTEM
 - TS** TOPSOIL STRIPPING DEPTH AND VOLUME
 - SS** SUBSOIL STRIPPING DEPTH AND VOLUME
 - TOPSOIL STRIPPING ONLY
 - TOPSOIL AND SUBSOIL
 - SPECIAL STOCKPILING REQUIREMENTS - FOOTPRINT WITHOUT CRANE PATH**
 - STOCKPILE WETLAND TOPSOIL AND SUBSOIL SEPARATE FROM NON-WETLAND TOPSOIL AND SUBSOIL¹
 - STOCKPILE TOPSOIL SEPARATELY FROM NON-SALT AFFECTED SOIL MAP UNITS²
 - SPECIAL SOIL STRIPPING AND WINDROWING REQUIREMENTS - UNDERGROUND COLLECTION SYSTEM**
 - NO SOIL STRIPPING - FOLLOW WETLAND MITIGATION MEASURES AND APPROVAL
 - STRIP AND WINDROW TOPSOIL ONLY³
 - NO SOIL STRIPPING
 - SOIL MAPPING - FOOTPRINT (WITHOUT CRANE PATH)**
 - BFD - BROWNFIELD
 - ZDL - DISTURBED LAND
 - ZGL - MISCELLANEOUS GLEYSOL
 - SOIL MAPPING - UNDERGROUND COLLECTION SYSTEM**
 - BFD - BROWNFIELD



NOTE(S)

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 PROJECTION: UTM ZONE 12 DATUM: NAD 83

CLIENT

Capital Power

PROJECT
 HALKIRK 2 WIND POWER PROJECT

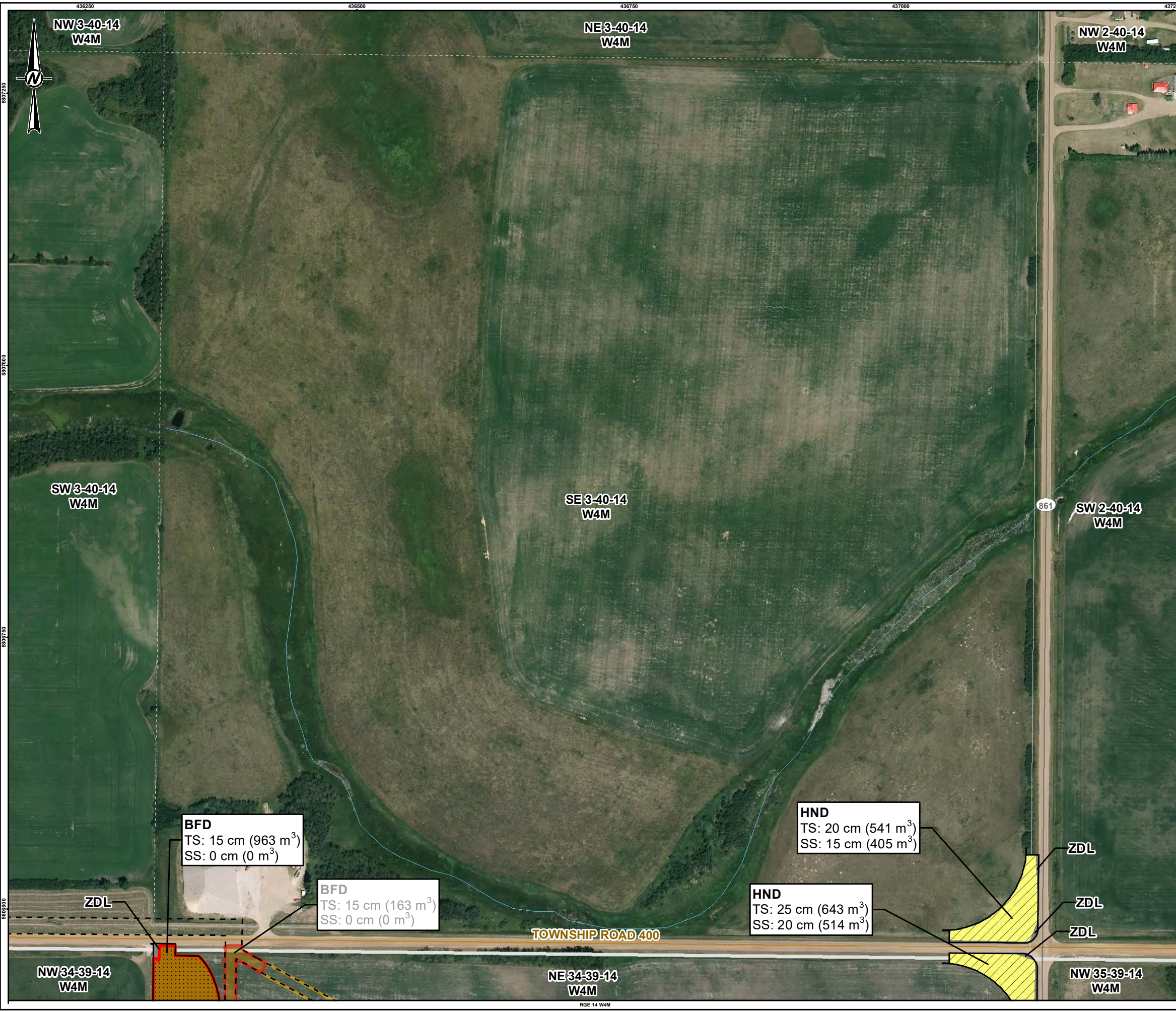
TITLE
 SOIL MAP UNITS WITHIN THE PROJECT FOOTPRINT
 SW 3-40-14 W4M

CONSULTANT	YYYY-MM-DD	2023-09-15
DESIGNED	SC	
PREPARED	LB/NB	
REVIEWED	LS	
APPROVED	SC	

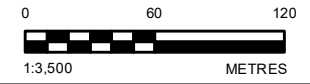
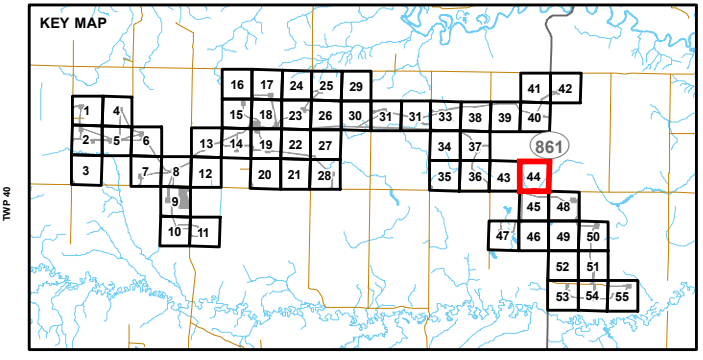
PROJECT NO. CONTROL REV. FIGURE
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PATH: I:\CLIENTS\CAPITAL_POWER\21452763\Mapping\Products\General\SWMP_Fig1452763_Fig1452763_Mapbook_SoilMapUnits_Rev0.mxd PRINTED ON: 2023-09-15 AT 12:29:46 AM
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IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B



- LEGEND**
- SECONDARY HIGHWAY
 - LOCAL ROAD
 - WATERCOURSE
- FOOTPRINT BOUNDARY**
- FOOTPRINT (WITHOUT CRANE PATH)
 - UNDERGROUND COLLECTOR SYSTEM
- TS TOPSOIL STRIPPING DEPTH AND VOLUME**
- TOPSOIL STRIPPING ONLY
 - //// TOPSOIL AND SUBSOIL
- SPECIAL STOCKPILING REQUIREMENTS - FOOTPRINT WITHOUT CRANE PATH**
- STOCKPILE TOPSOIL SEPARATELY FROM NON-SALT AFFECTED SOIL MAP UNITS²
- SPECIAL SOIL STRIPPING AND WINDROWING REQUIREMENTS - UNDERGROUND COLLECTION SYSTEM**
- STRIP AND WINDROW TOPSOIL ONLY³
 - NO SOIL STRIPPING
- SOIL MAPPING - FOOTPRINT (WITHOUT CRANE PATH)**
- BFD - BROWNFIELD
 - HND - HUGHENDEN
 - ZDL - DISTURBED LAND
- SOIL MAPPING - UNDERGROUND COLLECTION SYSTEM**
- BFD - BROWNFIELD



NOTE(S)

1. FOLLOW WETLAND MITIGATION MEASURES AND APPROVAL.
2. ALL POLYGONS WITH THIS SPECIAL STOCKPILING REQUIREMENT ARE PRESUMED TO BE SALT-AFFECTED; TOPSOIL FROM THESE POLYGONS CAN BE STOCKPILED TOGETHER, BUT MUST BE STOCKPILED SEPARATELY FROM POLYGONS WITHOUT THIS SPECIAL STOCKPILING REQUIREMENT.
3. IN CULTIVATED LANDS WHERE SALT-AFFECTED SOILS HAVE BEEN IDENTIFIED, IT IS RECOMMENDED THAT TOPSOIL WILL BE SALVAGED AND WINDROWED PRIOR TO PLOUGHING IN COLLECTOR LINES DURING PERIODS OF FROZEN GROUND CONDITIONS TO AVOID MIXING SALT-AFFECTED UPPER SUBSOIL INTO TOPSOIL.

REFERENCE(S)

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PROJECTION: UTM ZONE 12 DATUM: NAD 83

CLIENT

Capital Power

PROJECT

HALKIRK 2 WIND POWER PROJECT

TITLE

SOIL MAP UNITS WITHIN THE PROJECT FOOTPRINT SE 3-40-14 W4M

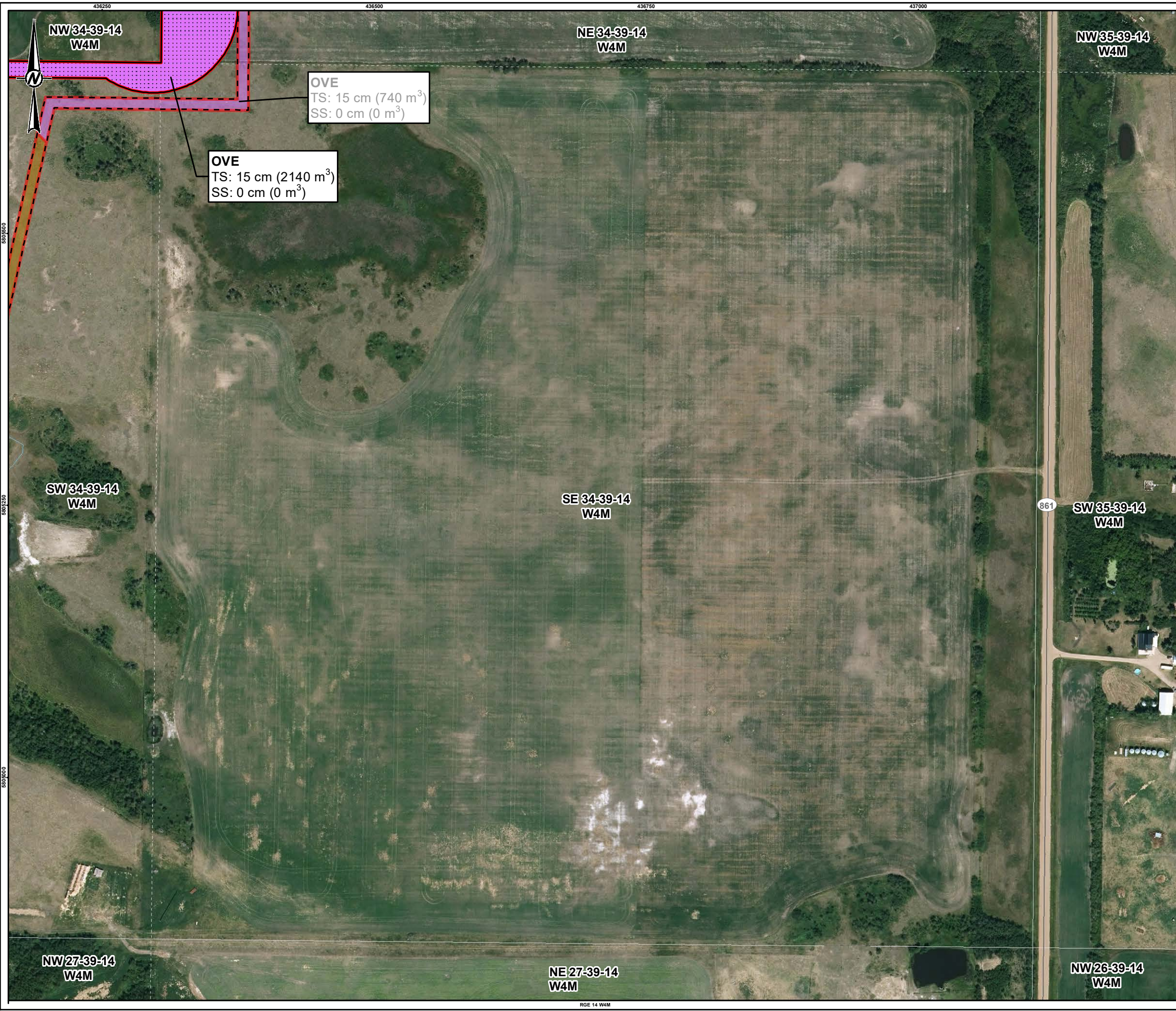
CONSULTANT

YYYY-MM-DD	2023-09-15
DESIGNED	SC
PREPARED	LB/NB
REVIEWED	LS
APPROVED	SC

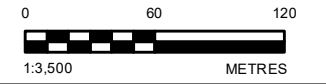
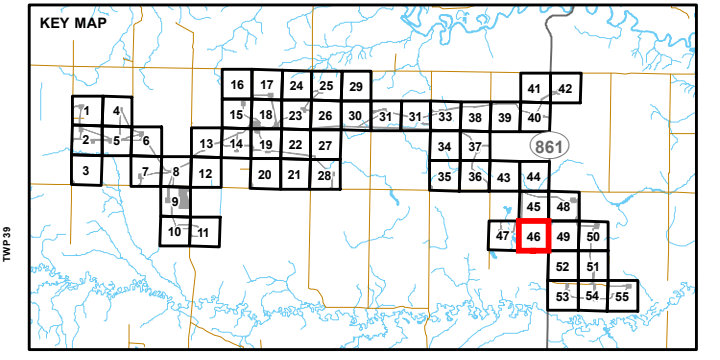
PROJECT NO. 21452763 CONTROL REV. 0 FIGURE B-44

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IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B



- LEGEND**
- SECONDARY
 - WATERCOURSE
- FOOTPRINT**
- FOOTPRINT (WITHOUT CRANE PATH)
 - - - UNDERGROUND COLLECTOR SYSTEM
- TS** TOPSOIL STRIPPING DEPTH AND VOLUME
- SS** SUBSOIL STRIPPING DEPTH AND VOLUME
- TOPSOIL STRIPPING
- SPECIAL STOCKPILING REQUIREMENTS - FOOTPRINT WITHOUT CRANE PATH**
- STOCKPILE TOPSOIL SEPARATELY FROM NON-SALT AFFECTED SOIL MAP UNITS²
- SPECIAL SOIL STRIPPING AND WINDROWING REQUIREMENTS - UNDERGROUND COLLECTION SYSTEM**
- STRIP AND WINDROW TOPSOIL ONLY³
- SOIL MAPPING - FOOTPRINT (WITHOUT CRANE PATH)**
- OVE - ONNEVUE
- SOIL MAPPING - UNDERGROUND COLLECTION SYSTEM**
- BFD - BROWNFIELD
 - OVE - ONNEVUE



NOTE(S)

1. FOLLOW WETLAND MITIGATION MEASURES AND APPROVAL.
2. ALL POLYGONS WITH THIS SPECIAL STOCKPILING REQUIREMENT ARE PRESUMED TO BE SALT-AFFECTED; TOPSOIL FROM THESE POLYGONS CAN BE STOCKPILED TOGETHER, BUT MUST BE STOCKPILED SEPARATELY FROM POLYGONS WITHOUT THIS SPECIAL STOCKPILING REQUIREMENT.
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REFERENCE(S)

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PROJECTION: UTM ZONE 12 DATUM: NAD 83

CLIENT

Capital Power

PROJECT
HALKIRK 2 WIND POWER PROJECT

TITLE
**SOIL MAP UNITS WITHIN THE PROJECT FOOTPRINT
SE 34-39-14 W4M**

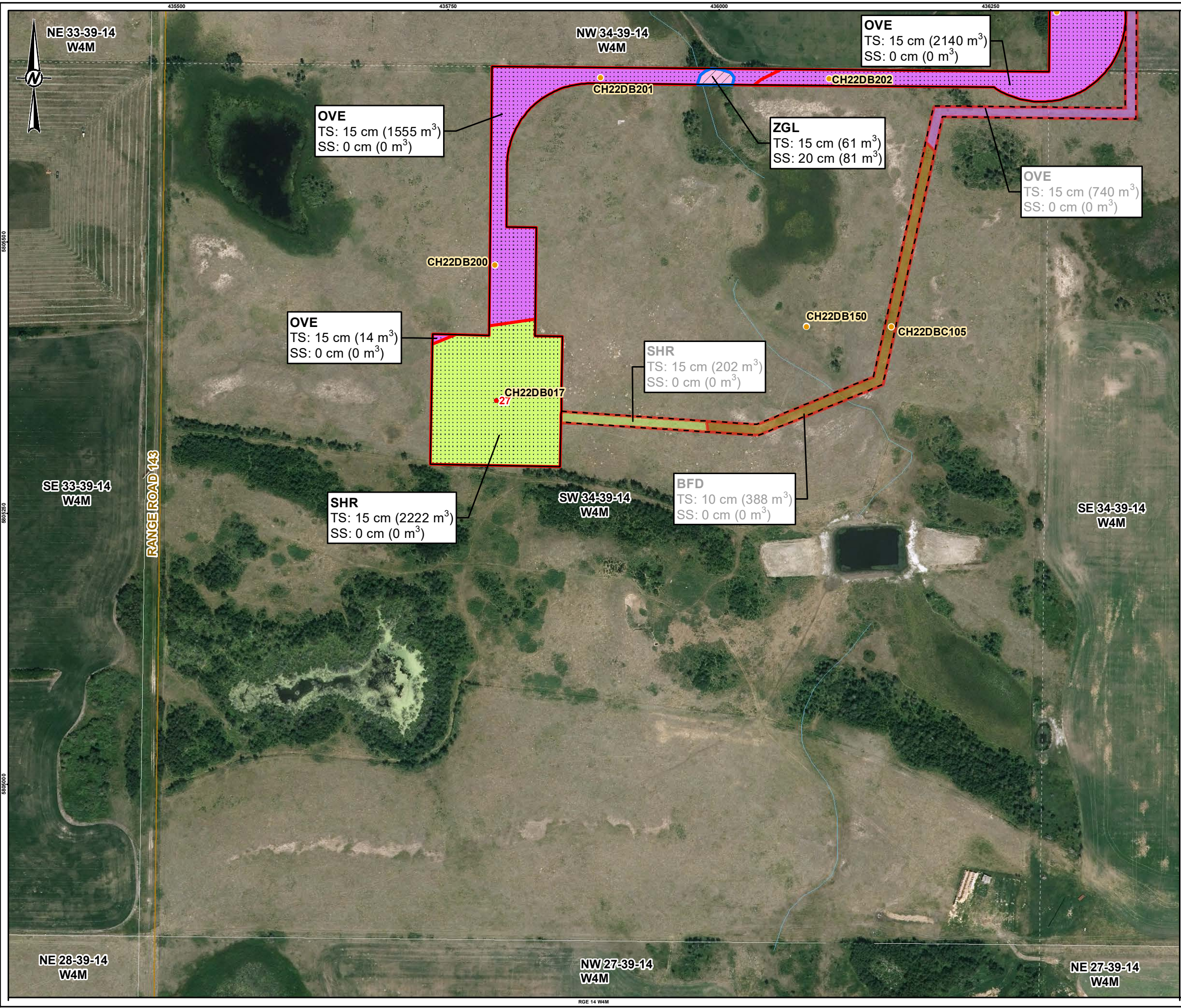
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	PREPARED	LB/NB
	REVIEWED	LS
	APPROVED	SC

PROJECT NO. CONTROL REV. FIGURE
21452763 0 B-46

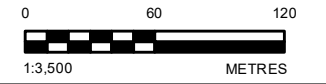
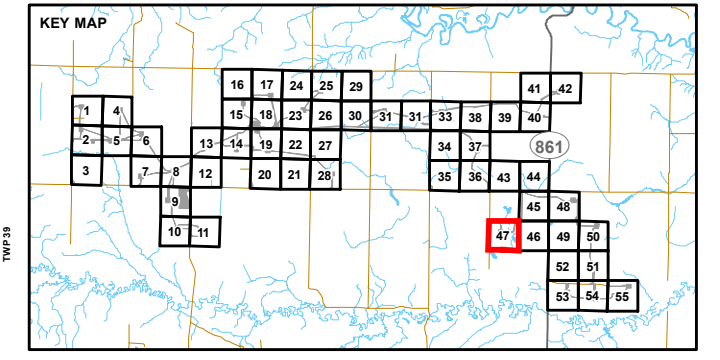
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IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B



- LEGEND**
- 2022 SOIL INSPECTION SITE
 - TURBINE
 - LOCAL ROAD
 - WATERCOURSE
- FOOTPRINT BOUNDARY**
- FOOTPRINT (WITHOUT CRANE PATH)
 - - - UNDERGROUND COLLECTOR SYSTEM
 - TS TOPSOIL STRIPPING DEPTH AND VOLUME
 - SS SUBSOIL STRIPPING DEPTH AND VOLUME
 - ⋮ TOPSOIL STRIPPING ONLY
 - /// TOPSOIL AND SUBSOIL
- SPECIAL STOCKPILING REQUIREMENTS - FOOTPRINT WITHOUT CRANE PATH**
- STOCKPILE WETLAND TOPSOIL AND SUBSOIL SEPARATE FROM NON-WETLAND TOPSOIL AND SUBSOIL¹
 - STOCKPILE TOPSOIL SEPARATELY FROM NON-SALT AFFECTED SOIL MAP UNITS²
- SPECIAL SOIL STRIPPING AND WINDROWING REQUIREMENTS - UNDERGROUND COLLECTION SYSTEM**
- STRIP AND WINDROW TOPSOIL ONLY³
- SOIL MAPPING - FOOTPRINT (WITHOUT CRANE PATH)**
- OVE - ONNEVUE
 - SHR - SHEERNESS
 - ZGL - MISCELLANEOUS GLEYSOL
- SOIL MAPPING - UNDERGROUND COLLECTION SYSTEM**
- BFD - BROWNFIELD
 - OVE - ONNEVUE
 - SHR - SHEERNESS



NOTE(S)

1. FOLLOW WETLAND MITIGATION MEASURES AND APPROVAL.
2. ALL POLYGONS WITH THIS SPECIAL STOCKPILING REQUIREMENT ARE PRESUMED TO BE SALT-AFFECTED; TOPSOIL FROM THESE POLYGONS CAN BE STOCKPILED TOGETHER, BUT MUST BE STOCKPILED SEPARATELY FROM POLYGONS WITHOUT THIS SPECIAL STOCKPILING REQUIREMENT.
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REFERENCE(S)

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 PROJECTION: UTM ZONE 12 DATUM: NAD 83

CLIENT

Capital Power

PROJECT
HALKIRK 2 WIND POWER PROJECT

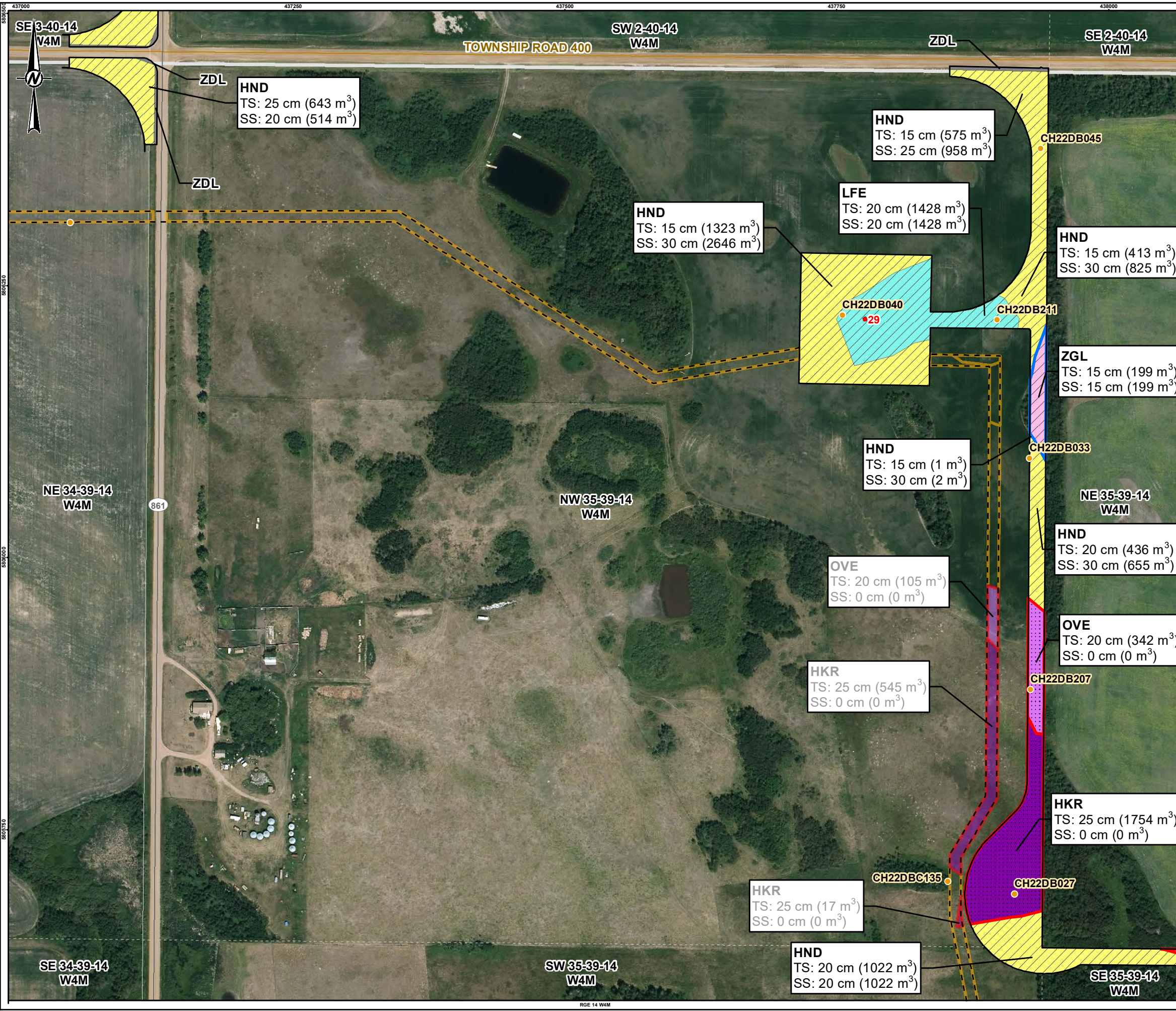
TITLE
**SOIL MAP UNITS WITHIN THE PROJECT FOOTPRINT
SW 34-39-14 W4M**

CONSULTANT	YYYY-MM-DD	2023-09-15
	DESIGNED	SC
	PREPARED	LB/NB
	REVIEWED	LS
	APPROVED	SC

PROJECT NO. CONTROL REV. FIGURE
21452763 0 B-47

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 809250
 809250

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B



LEGEND

- 2022 SOIL INSPECTION SITE
- TURBINE
- SECONDARY HIGHWAY
- LOCAL ROAD

FOOTPRINT BOUNDARY

- FOOTPRINT (WITHOUT CRANE PATH)
- UNDERGROUND COLLECTOR SYSTEM

TS TOPSOIL STRIPPING DEPTH AND VOLUME

- SS SUBSOIL STRIPPING DEPTH AND VOLUME
- TOPSOIL STRIPPING ONLY
- /// TOPSOIL AND SUBSOIL

SPECIAL STOCKPILING REQUIREMENTS - FOOTPRINT WITHOUT CRANE PATH

- STOCKPILE WETLAND TOPSOIL AND SUBSOIL SEPARATE FROM NON-WETLAND TOPSOIL AND SUBSOIL¹
- STOCKPILE TOPSOIL SEPARATELY FROM NON-SALT AFFECTED SOIL MAP UNITS²

SPECIAL SOIL STRIPPING AND WINDROWING REQUIREMENTS - UNDERGROUND COLLECTION SYSTEM

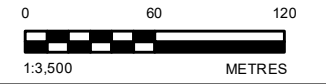
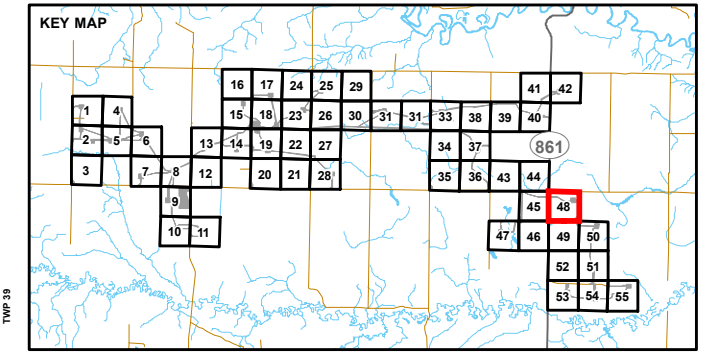
- STRIP AND WINDROW TOPSOIL ONLY³
- NO SOIL STRIPPING

SOIL MAPPING - FOOTPRINT (WITHOUT CRANE PATH)

- FST - FLAGSTAFF
- HKR - HALKIRK
- HND - HUGHENDEN
- LFE - LANFINE
- OVE - ONNEVUE
- ZDL - DISTURBED LAND
- ZGL - MISCELLANEOUS GLEYSOL

SOIL MAPPING - UNDERGROUND COLLECTION SYSTEM

- HKR - HALKIRK
- OVE - ONNEVUE



NOTE(S)

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 PROJECTION: UTM ZONE 12 DATUM: NAD 83

CLIENT

Capital Power

PROJECT
 HALKIRK 2 WIND POWER PROJECT

TITLE
SOIL MAP UNITS WITHIN THE PROJECT FOOTPRINT
 NW 35-39-14 W4M

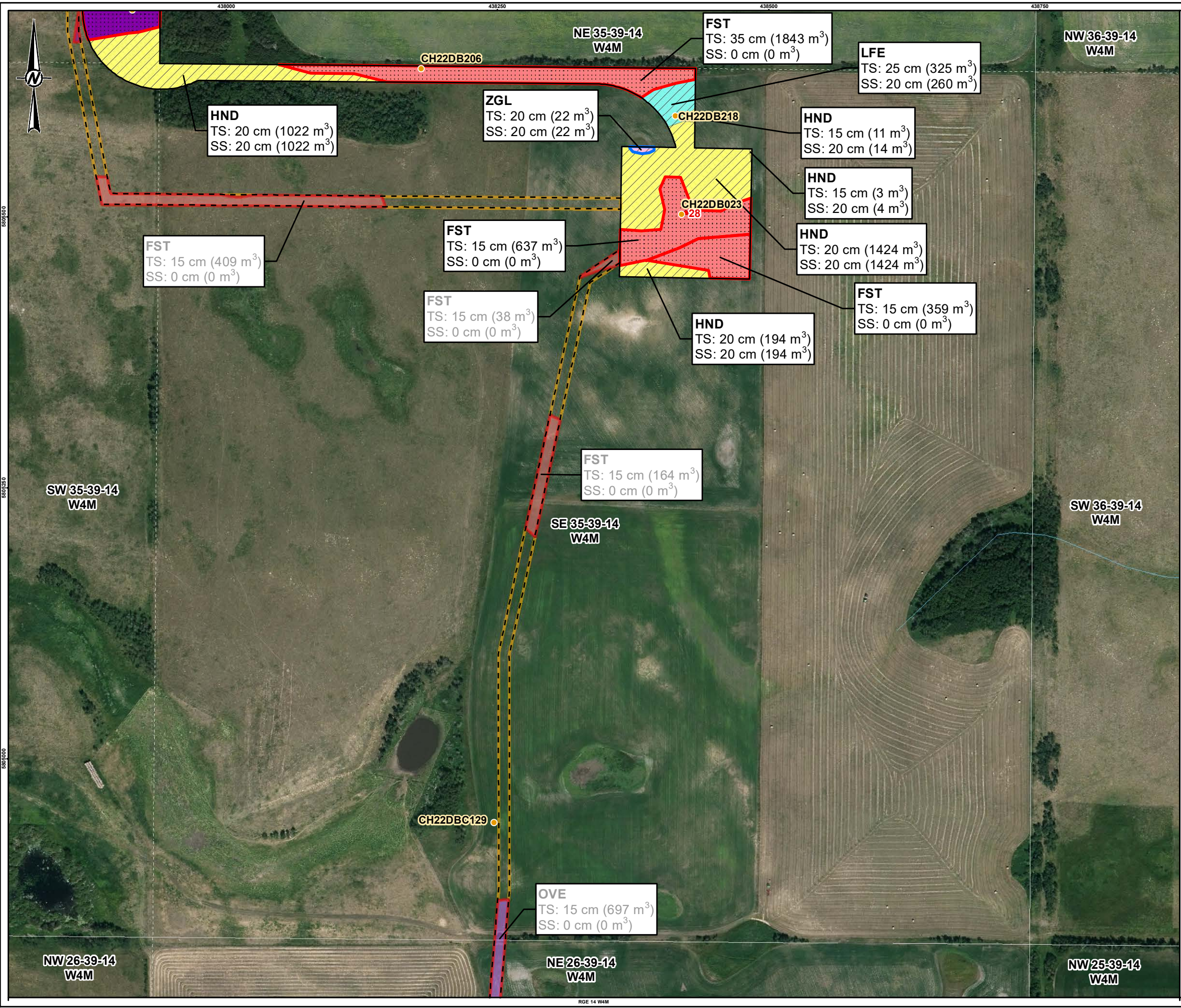
CONSULTANT

YYYY-MM-DD	2023-09-15
DESIGNED	SC
PREPARED	LB/NB
REVIEWED	LS
APPROVED	SC

PROJECT NO. CONTROL REV. FIGURE
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IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B



LEGEND

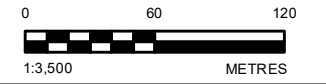
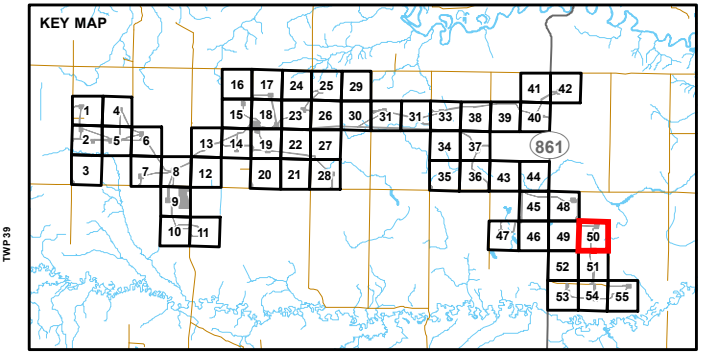
- 2022 SOIL INSPECTION SITE
- TURBINE
- WATERCOURSE
- FOOTPRINT BOUNDARY
- FOOTPRINT (WITHOUT CRANE PATH)
- - - UNDERGROUND COLLECTOR SYSTEM
- TS TOPSOIL STRIPPING DEPTH AND VOLUME
- SS SUBSOIL STRIPPING DEPTH AND VOLUME
- TOPSOIL STRIPPING ONLY
- //// TOPSOIL AND SUBSOIL
- SPECIAL STOCKPILING REQUIREMENTS - FOOTPRINT WITHOUT CRANE PATH**
- STOCKPILE WETLAND TOPSOIL AND SUBSOIL SEPARATE FROM NON-WETLAND TOPSOIL AND SUBSOIL¹
- STOCKPILE TOPSOIL SEPARATELY FROM NON-SALT AFFECTED SOIL MAP UNITS²
- SPECIAL SOIL STRIPPING AND WINDROWING REQUIREMENTS - UNDERGROUND COLLECTION SYSTEM**
- STRIP AND WINDROW TOPSOIL ONLY³
- NO SOIL STRIPPING

SOIL MAPPING - FOOTPRINT (WITHOUT CRANE PATH)

- FST - FLAGSTAFF
- HKR - HALKIRK
- HND - HUGHENDEN
- LFE - LANFINE
- ZGL - MISCELLANEOUS GLEYSOL

SOIL MAPPING - UNDERGROUND COLLECTION SYSTEM

- FST - FLAGSTAFF
- HKR - HALKIRK
- OVE - ONNEVUE



NOTE(S)

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 PROJECTION: UTM ZONE 12 DATUM: NAD 83

CLIENT

Capital Power

PROJECT
HALKIRK 2 WIND POWER PROJECT

TITLE
**SOIL MAP UNITS WITHIN THE PROJECT FOOTPRINT
 SE 35-39-14 W4M**

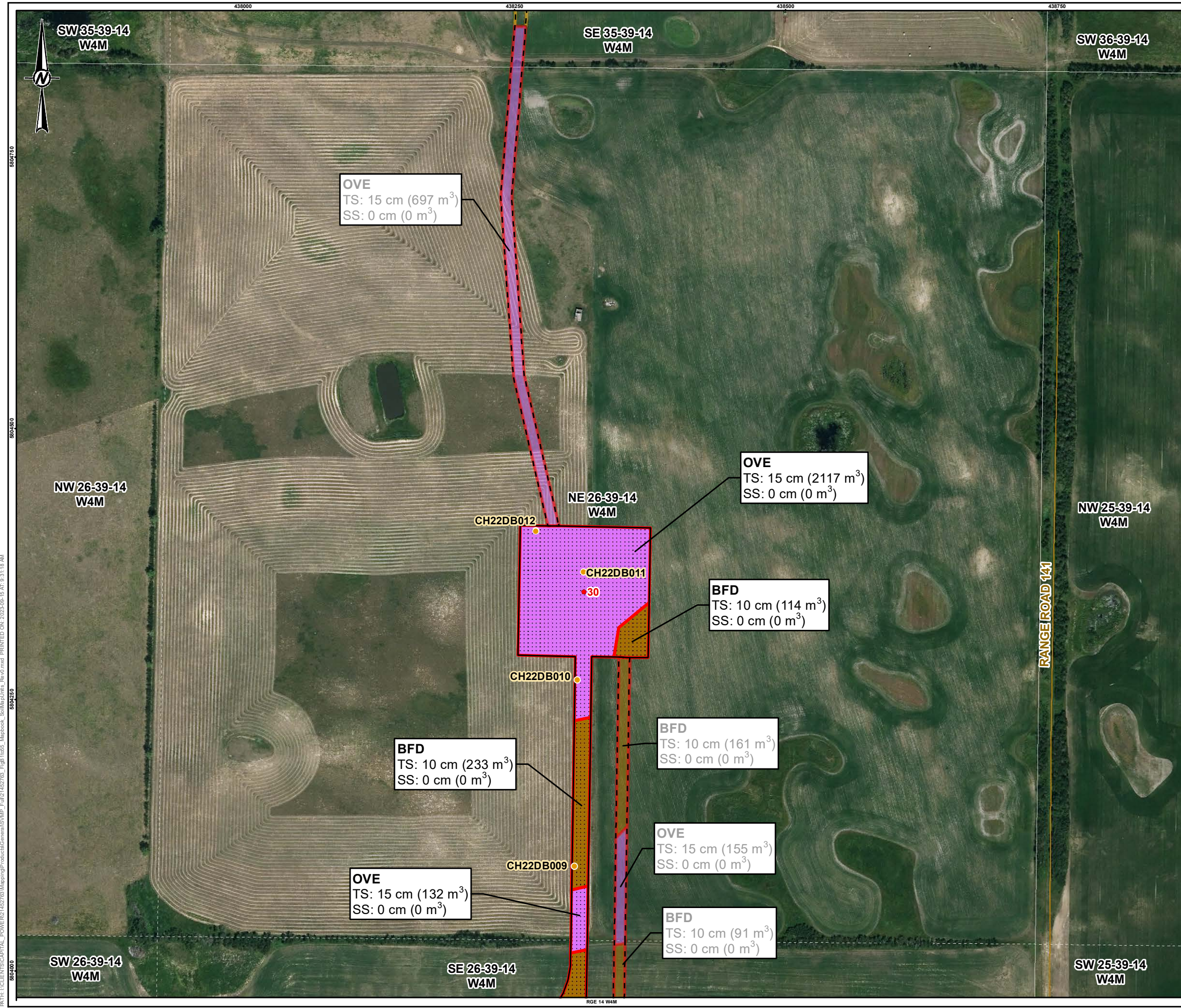
CONSULTANT

YYYY-MM-DD	2023-09-15
DESIGNED	SC
PREPARED	LB/NB
REVIEWED	LS
APPROVED	SC

PROJECT NO. CONTROL REV. FIGURE
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IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B
 26mm



OVE
 TS: 15 cm (697 m³)
 SS: 0 cm (0 m³)

OVE
 TS: 15 cm (2117 m³)
 SS: 0 cm (0 m³)

BFD
 TS: 10 cm (114 m³)
 SS: 0 cm (0 m³)

BFD
 TS: 10 cm (161 m³)
 SS: 0 cm (0 m³)

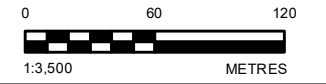
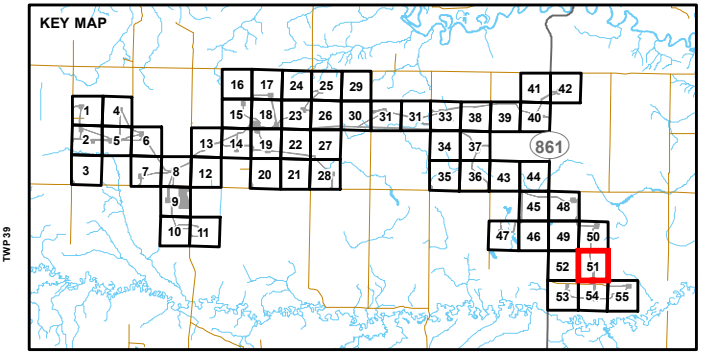
OVE
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 SS: 0 cm (0 m³)

BFD
 TS: 10 cm (91 m³)
 SS: 0 cm (0 m³)

BFD
 TS: 10 cm (233 m³)
 SS: 0 cm (0 m³)

OVE
 TS: 15 cm (132 m³)
 SS: 0 cm (0 m³)

- LEGEND**
- 2022 SOIL INSPECTION SITE
 - TURBINE
 - LOCAL ROAD
 - FOOTPRINT (WITHOUT CRANE PATH)
 - - - UNDERGROUND COLLECTOR SYSTEM
 - TS TOPSOIL STRIPPING DEPTH AND VOLUME
 - SS SUBSOIL STRIPPING DEPTH AND VOLUME
 - ⋯ TOPSOIL STRIPPING ONLY
 - SPECIAL STOCKPILING REQUIREMENTS - FOOTPRINT WITHOUT CRANE PATH
 - STOCKPILE TOPSOIL SEPARATELY FROM NON-SALT AFFECTED SOIL MAP UNITS²
 - SPECIAL SOIL STRIPPING AND WINDROWING REQUIREMENTS - UNDERGROUND COLLECTION SYSTEM
 - STRIP AND WINDROW TOPSOIL ONLY³
 - NO SOIL STRIPPING
- SOIL MAPPING - FOOTPRINT (WITHOUT CRANE PATH)**
- BFD - BROWNFIELD
 - OVE - ONNEVUE
- SOIL MAPPING - UNDERGROUND COLLECTION SYSTEM**
- BFD - BROWNFIELD
 - OVE - ONNEVUE



NOTE(S)

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REFERENCE(S)

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 PROJECTION: UTM ZONE 12 DATUM: NAD 83

CLIENT

Capital Power

PROJECT
 HALKIRK 2 WIND POWER PROJECT

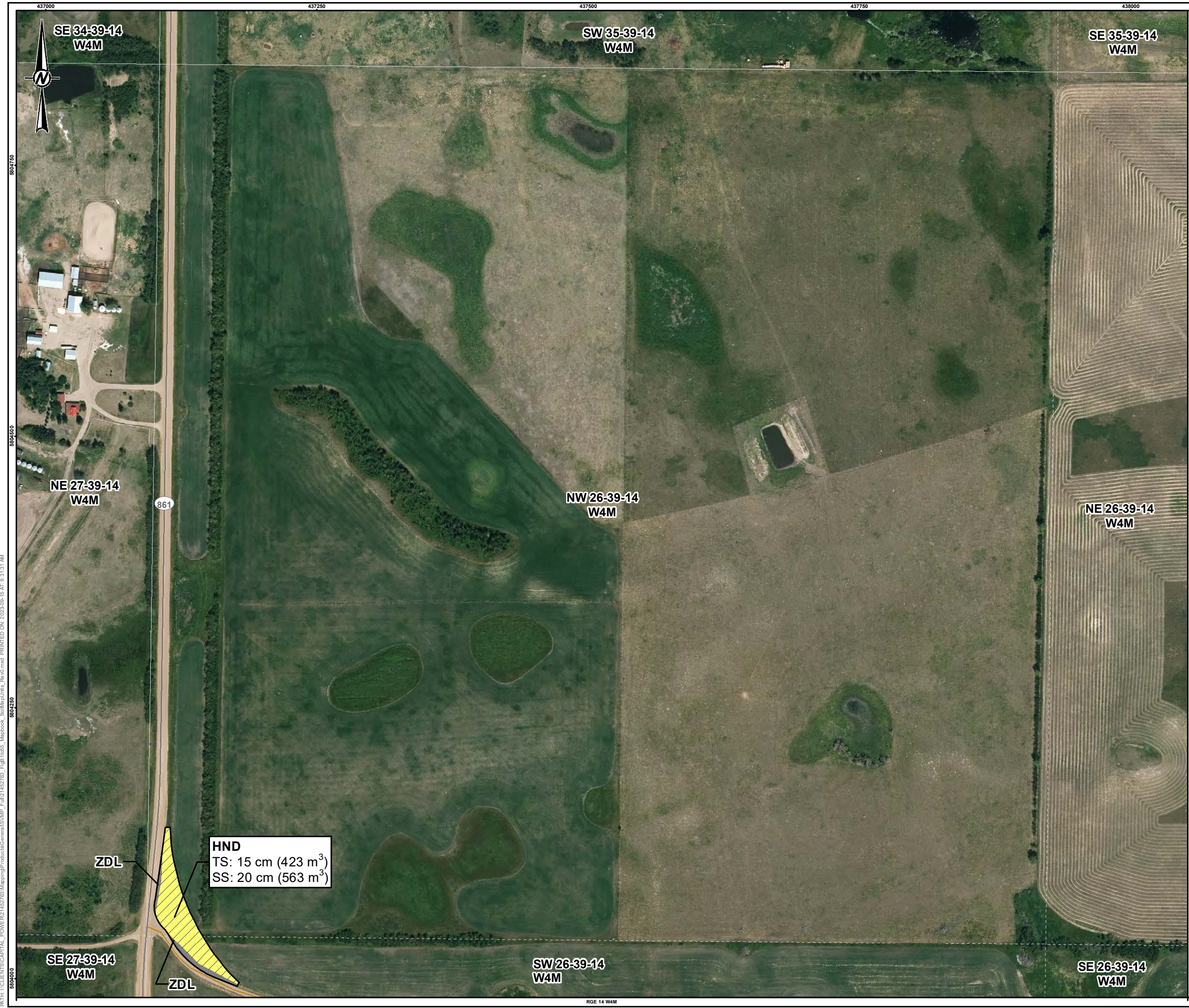
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 NE 26-39-14 W4M**

CONSULTANT	YYYY-MM-DD	2023-09-15
	DESIGNED	SC
	PREPARED	LB/NB
	REVIEWED	LS
	APPROVED	SC

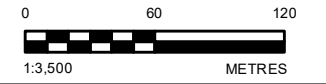
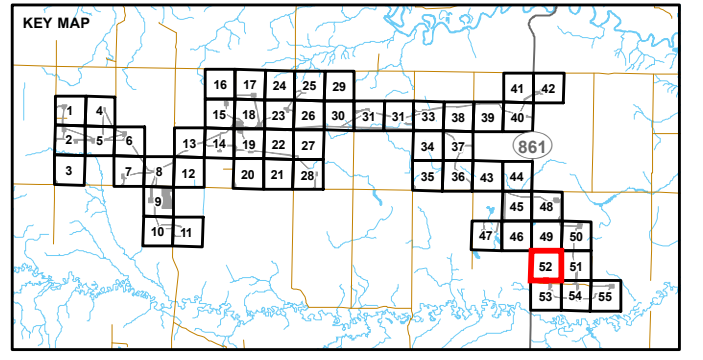
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IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B



- LEGEND**
- SECONDARY HIGHWAY
 - LOCAL ROAD
 - FOOTPRINT BOUNDARY
 - FOOTPRINT (WITHOUT CRANE PATH)
 - - - UNDERGROUND COLLECTOR SYSTEM
 - TS TOPSOIL STRIPPING DEPTH AND VOLUME
 - SS SUBSOIL STRIPPING DEPTH AND VOLUME
 - /// TOPSOIL AND SUBSOIL
- SOIL MAPPING - FOOTPRINT (WITHOUT CRANE PATH)**
- HND - HUGHENDEN
 - ZDL - DISTURBED LAND



NOTE(S)

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 PROJECTION: UTM ZONE 12 DATUM: NAD 83

CLIENT

Capital Power

PROJECT

HALKIRK 2 WIND POWER PROJECT

TITLE

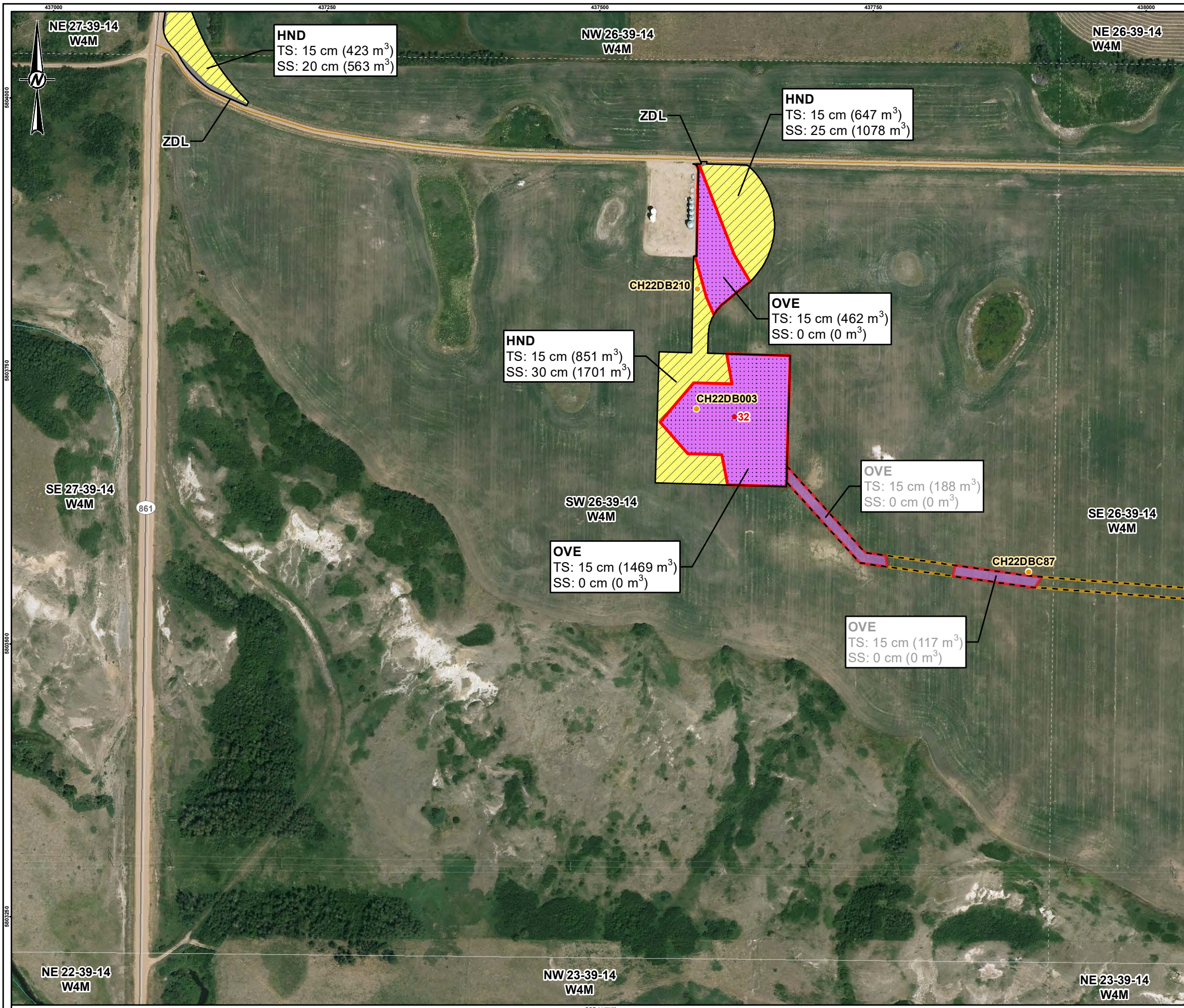
SOIL MAP UNITS WITHIN THE PROJECT FOOTPRINT
 NW 26-39-14 W4M

CONSULTANT	YYYY-MM-DD	2023-09-15
DESIGNED	SC	
PREPARED	LB/NB	
REVIEWED	LS	
APPROVED	SC	

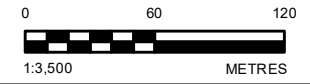
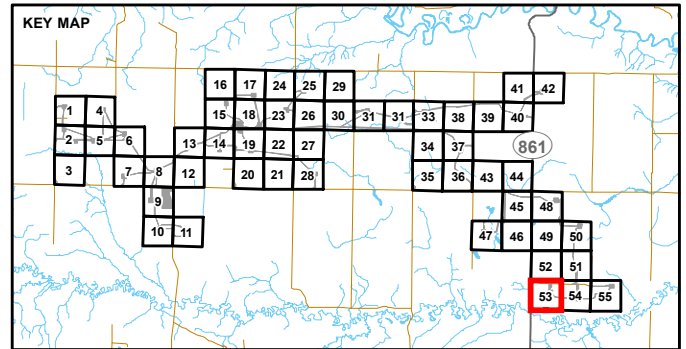
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IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B
 26mm



- LEGEND**
- 2022 SOIL INSPECTION SITE
 - TURBINE
 - SECONDARY HIGHWAY
 - LOCAL ROAD
 - WATERCOURSE
- FOOTPRINT BOUNDARY**
- FOOTPRINT (WITHOUT CRANE PATH)
 - - - UNDERGROUND COLLECTOR SYSTEM
 - TS TOPSOIL STRIPPING DEPTH AND VOLUME
 - SS SUBSOIL STRIPPING DEPTH AND VOLUME
 - TOPSOIL STRIPPING ONLY
 - TOPSOIL AND SUBSOIL
- SPECIAL STOCKPILING REQUIREMENTS - FOOTPRINT WITHOUT CRANE PATH**
- STOCKPILE TOPSOIL SEPARATELY FROM NON-SALT AFFECTED SOIL MAP UNITS²
- SPECIAL SOIL STRIPPING AND WINDROWING REQUIREMENTS - UNDERGROUND COLLECTION SYSTEM**
- STRIP AND WINDROW TOPSOIL ONLY³
 - NO SOIL STRIPPING
- SOIL MAPPING - FOOTPRINT (WITHOUT CRANE PATH)**
- HND - HUGHENDEN
 - OVE - ONNEVUE
 - ZDL - DISTURBED LAND
- SOIL MAPPING - UNDERGROUND COLLECTION SYSTEM**
- OVE - ONNEVUE



NOTE(S)

1. FOLLOW WETLAND MITIGATION MEASURES AND APPROVAL.
2. ALL POLYGONS WITH THIS SPECIAL STOCKPILING REQUIREMENT ARE PRESUMED TO BE SALT-AFFECTED; TOPSOIL FROM THESE POLYGONS CAN BE STOCKPILED TOGETHER, BUT MUST BE STOCKPILED SEPARATELY FROM POLYGONS WITHOUT THIS SPECIAL STOCKPILING REQUIREMENT.
3. IN CULTIVATED LANDS WHERE SALT-AFFECTED SOILS HAVE BEEN IDENTIFIED, IT IS RECOMMENDED THAT TOPSOIL WILL BE SALVAGED AND WINDROWED PRIOR TO PLOUGHING IN COLLECTOR LINES DURING PERIODS OF FROZEN GROUND CONDITIONS TO AVOID MIXING SALT-AFFECTED UPPER SUBSOIL INTO TOPSOIL.

REFERENCE(S)

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 PROJECTION: UTM ZONE 12 DATUM: NAD 83

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Capital Power

PROJECT
HALKIRK 2 WIND POWER PROJECT

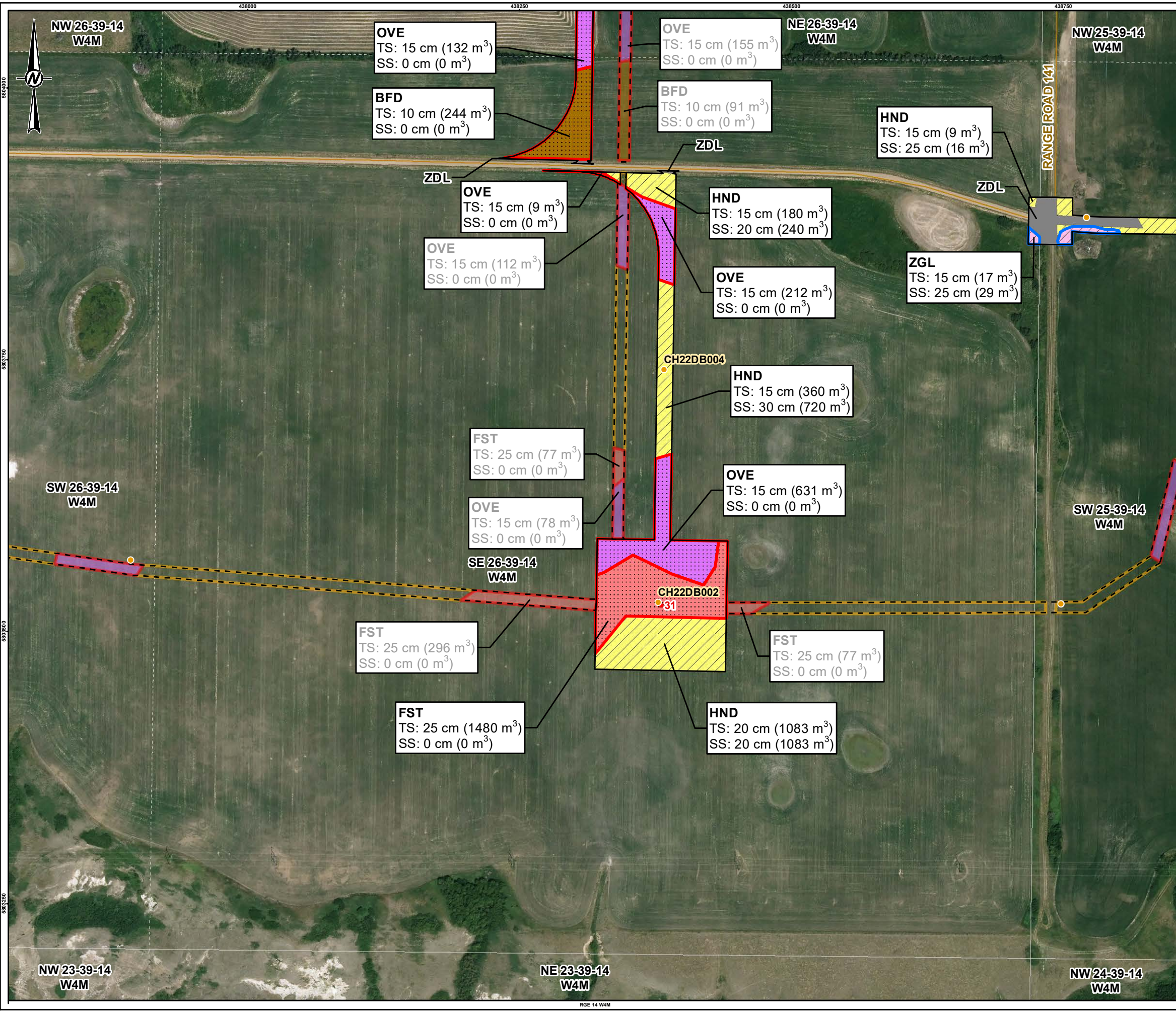
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 SW 26-39-14 W4M**

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	DESIGNED	SC
	PREPARED	LB/NB
	REVIEWED	LS
	APPROVED	SC

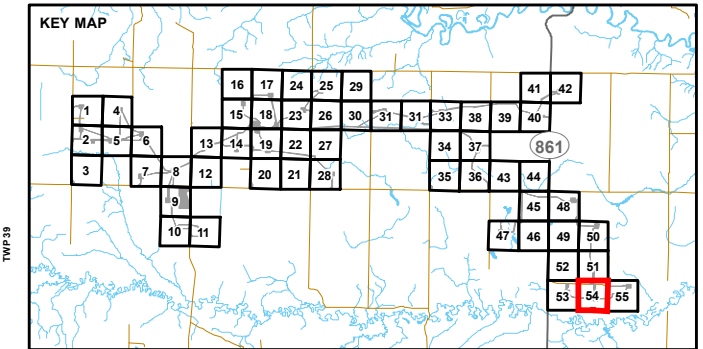
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- LEGEND**
- 2022 SOIL INSPECTION SITE
 - TURBINE
 - LOCAL ROAD
 - FOOTPRINT (WITHOUT CRANE PATH)
 - UNDERGROUND COLLECTOR SYSTEM
 - TS** TOPSOIL STRIPPING DEPTH AND VOLUME
 - SS** SUBSOIL STRIPPING DEPTH AND VOLUME
 - TOPSOIL STRIPPING ONLY
 - TOPSOIL AND SUBSOIL
 - SPECIAL STOCKPILING REQUIREMENTS - FOOTPRINT WITHOUT CRANE PATH**
 - STOCKPILE WETLAND TOPSOIL AND SUBSOIL SEPARATE FROM NON-WETLAND TOPSOIL AND SUBSOIL¹
 - STOCKPILE TOPSOIL SEPARATELY FROM NON-SALT AFFECTED SOIL MAP UNITS²
 - SPECIAL SOIL STRIPPING AND WINDROWING REQUIREMENTS - UNDERGROUND COLLECTION SYSTEM**
 - STRIP AND WINDROW TOPSOIL ONLY³
 - NO SOIL STRIPPING
- SOIL MAPPING - FOOTPRINT (WITHOUT CRANE PATH)**
- BFD - BROWNFIELD
 - FST - FLAGSTAFF
 - HND - HUGHENDEN
 - OVE - ONNEVUE
 - ZDL - DISTURBED LAND
 - ZGL - MISCELLANEOUS GLEYSOL
- SOIL MAPPING - UNDERGROUND COLLECTION SYSTEM**
- BFD - BROWNFIELD
 - FST - FLAGSTAFF
 - OVE - ONNEVUE



NOTE(S)

1. FOLLOW WETLAND MITIGATION MEASURES AND APPROVAL.
2. ALL POLYGONS WITH THIS SPECIAL STOCKPILING REQUIREMENT ARE PRESUMED TO BE SALT-AFFECTED; TOPSOIL FROM THESE POLYGONS CAN BE STOCKPILED TOGETHER, BUT MUST BE STOCKPILED SEPARATELY FROM POLYGONS WITHOUT THIS SPECIAL STOCKPILING REQUIREMENT.
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REFERENCE(S)

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Capital Power

PROJECT
HALKIRK 2 WIND POWER PROJECT

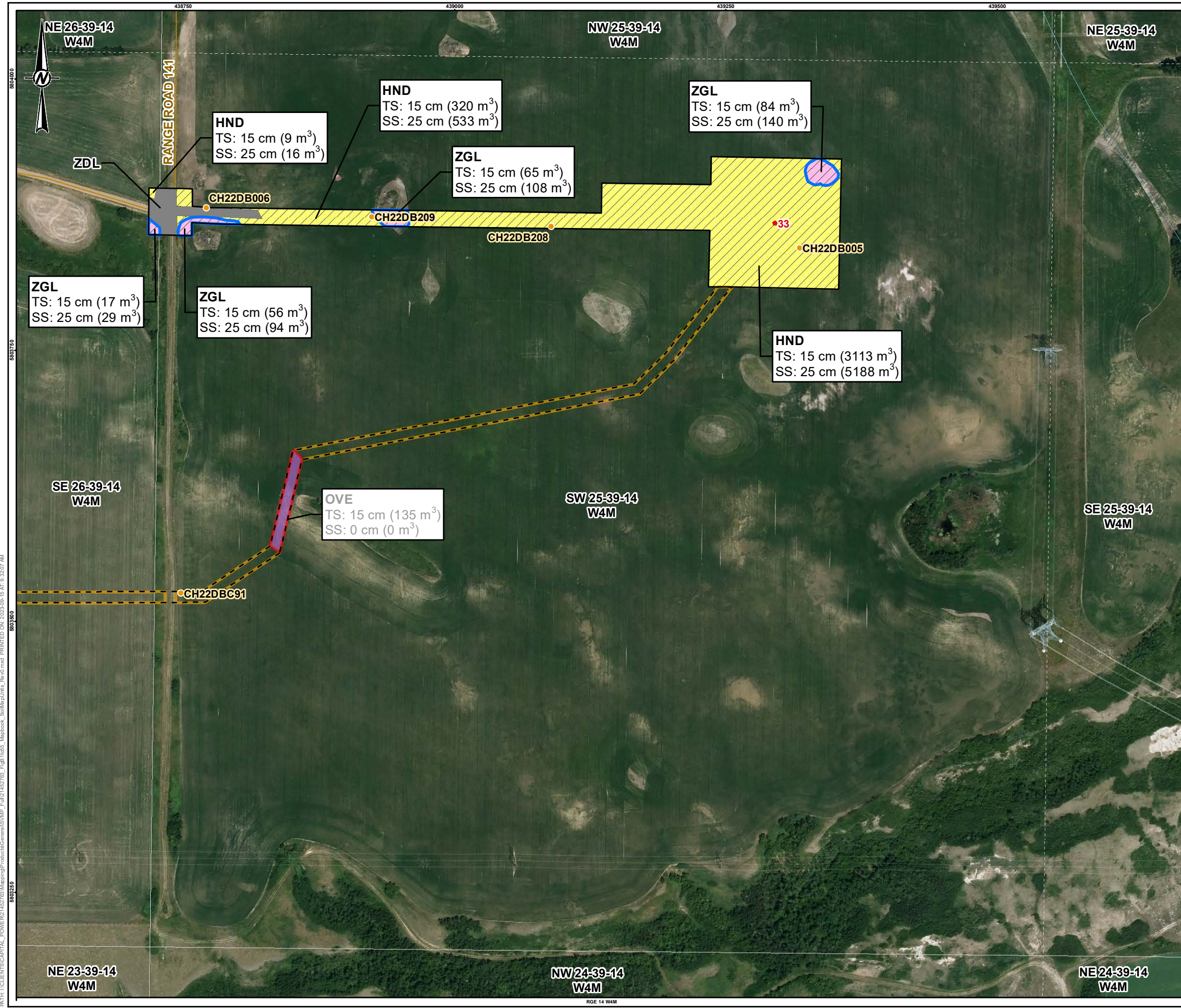
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SE 26-39-14 W4M**

CONSULTANT	YYYY-MM-DD 2023-09-15
DESIGNED	SC
PREPARED	LB/NB
REVIEWED	LS
APPROVED	SC

PROJECT NO. 21452763 CONTROL REV. 0 FIGURE B-54

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LEGEND

- 2022 SOIL INSPECTION SITE
- TURBINE
- LOCAL ROAD
- WATERCOURSE

FOOTPRINT BOUNDARY

- ▭ FOOTPRINT (WITHOUT CRANE PATH)
- ▭ UNDERGROUND COLLECTOR SYSTEM
- TS TOPSOIL STRIPPING DEPTH AND VOLUME
- SS SUBSOIL STRIPPING DEPTH AND VOLUME
- /// TOPSOIL AND SUBSOIL

SPECIAL STOCKPILING REQUIREMENTS - FOOTPRINT WITHOUT CRANE PATH

- ▭ STOCKPILE WETLAND TOPSOIL AND SUBSOIL SEPARATE FROM NON-WETLAND TOPSOIL AND SUBSOIL¹

SPECIAL SOIL STRIPPING AND WINDROWING REQUIREMENTS - UNDERGROUND COLLECTION SYSTEM

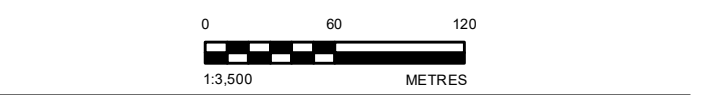
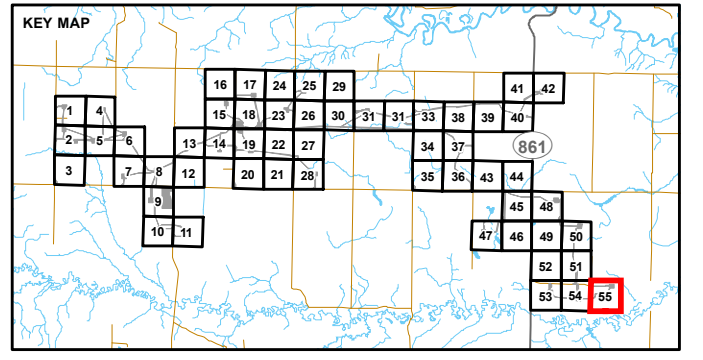
- ▭ STRIP AND WINDROW TOPSOIL ONLY³
- ▭ NO SOIL STRIPPING

SOIL MAPPING - FOOTPRINT (WITHOUT CRANE PATH)

- ▭ HND - HUGHENDEN
- ▭ ZDL - DISTURBED LAND
- ▭ ZGL - MISCELLANEOUS GLEYSOL

SOIL MAPPING - UNDERGROUND COLLECTION SYSTEM

- ▭ OVE - ONNEVUE



NOTE(S)

1. FOLLOW WETLAND MITIGATION MEASURES AND APPROVAL.
2. ALL POLYGONS WITH THIS SPECIAL STOCKPILING REQUIREMENT ARE PRESUMED TO BE SALT-AFFECTED; TOPSOIL FROM THESE POLYGONS CAN BE STOCKPILED TOGETHER, BUT MUST BE STOCKPILED SEPARATELY FROM POLYGONS WITHOUT THIS SPECIAL STOCKPILING REQUIREMENT.
3. IN CULTIVATED LANDS WHERE SALT-AFFECTED SOILS HAVE BEEN IDENTIFIED, IT IS RECOMMENDED THAT TOPSOIL WILL BE SALVAGED AND WINDROWED PRIOR TO PLOUGHING IN COLLECTOR LINES DURING PERIODS OF FROZEN GROUND CONDITIONS TO AVOID MIXING SALT-AFFECTED UPPER SUBSOIL INTO TOPSOIL.

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 PROJECTION: UTM ZONE 12 DATUM: NAD 83

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PROJECT

HALKIRK 2 WIND POWER PROJECT

TITLE

SOIL MAP UNITS WITHIN THE PROJECT FOOTPRINT
SW 25-39-14 W4M

CONSULTANT

YYYY-MM-DD	2023-09-15
DESIGNED	SC
PREPARED	LB/NB
REVIEWED	LS
APPROVED	SC

PROJECT NO. CONTROL REV. FIGURE

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 26mm

APPENDIX C

Soil Map Unit Descriptions

1.0 KEY TO SOIL INSPECTION ABBREVIATIONS

Table C-1: Soil Phases

Suffix Applied as Unit Modifier	Meaning/Explanation
ca	Calcareous – soils with primary alkaline earth carbonates in the B horizon (Bmk)
co	Coarse variant – soils are at least one textural class coarse than modal
gl	Gleyed – poor drainage and periodic reduction

Note:

Alberta Soil Names File (Generation 4) User's Handbook (ASIC 2016).

Table C-2: Surface Expression

Surface Expression Code	Description
H1l	Hummocky (low relief)
H1m	Hummocky (medium relief)
H1h	Hummocky (high relief)
IU1	Inclined and undulating
L1	Level Plain
L2	Level and closed basin (depression with raised edges)
M1m	Rolling (slopes >400 m in length; multi-directional) moderate relief
U1l	Undulating (low relief)
U1h	Undulating (high relief)

Note:

AGRASID Version 3.0 Soil Landscapes User's Manual (CAESA 2001).

Table C-3: Soil Subgroup Classification

Soil Subgroup Code	Description
CA.DBC	Calcareous Dark Brown Chernozem
DB.SO	Dark Brown Solod
DB.SS	Dark Brown Solodized Solonetz
DB.SZ	Dark Brown Solonetz
E.DBC	Eluviated Dark Brown Chernozem
GL.DBC	Gleyed Dark Brown Chernozem
GL.HR	Gleyed Humic Regosol
GLE.DBC	Gleyed Eluviated Dark Brown Chernozem
GLDB.SZ	Gleyed Dark Brown Solonetz
GLSZ.DBC	Gleyed Solonetzic Dark Brown Chernozem
HU.LG	Humic Luvic Gleysol
O.DBC	Orthic Dark Brown Chernozem
O.HG	Orthic Humic Gleysol
SZ.DBC	Solonetzic Dark Brown Chernozem

Note:

Canadian System of Soil Classification (SCWG 1998).

Table C-4: Parent Materials

Parent Material Code	Description
GLLC	Glaciolacustrine
GLFL/TILL	Glaciofluvial over Till (Morainal)
TILL	Till (Morainal)

Note:

Alberta Soil Names File (Generation 4) User's Handbook (ASIC 2016).

Table C-5: Parent Materials

Parent Material Code	Description
C5	Moderately coarse textured (SL, FSL) till
F1	Fine textured (C, SiC) water-laid sediments
F4	Fine textured (C) till
L2	Coarse textured (S, LS, SL) materials over medium (L, CL) or fine (C) textured till
M4	Medium textured (L, CL) till

Note:

Alberta Soil Names File (Generation 4) User's Handbook (ASIC 2016).

SL = sandy loam; FSL = Fine Sandy Loam; C= clay; SiC = Silty Clay; S = Sand; LS = Loamy Sand; SL = Sandy Loam; CL = Clay Loam

Table C-6: Slope Class

Slope Class Code	Description [%]
1	0 to 0.5 (level)
2	0.5 to 2 (nearly level)
3	2 to 5 (very gentle slopes)
4	6 to 9 (gentle slopes)
5	10 to 15 (moderate slopes)

Note:

Soil Subgroups from the Canadian System of Soil Classification (SCWG 1998).

% = percentage.

Table C-7: Drainage Classes

Drainage Class Code	Description
W	Well
MW	Moderately Well
I	Imperfect
P	Poor
R	Rapid

Note:

Manual for Describing Soils in the Field: 1982 Revised (Expert Committee on Soil Survey 1982).

Table C-8: Slope Position

Slope Position Code	Description
C	Crest
U	Upper
M	Middle
L	Lower
T	Toe
V	Level
D	Depression

Note:

Manual for Describing Soils in the Field: 1982 Revised (Expert Committee on Soil Survey 1982).

Table C-9: Soil Texture

Soil Texture Code	Description	Soil Texture Code	Description
S	Sand	SCL	Sandy Clay Loam
LS	Loamy Sandy	CL	Clay Loam
SL	Sandy Loam	SiCL	Silty Clay Loam
fSL	Fine Sandy Loam	SC	Sandy Clay
vfSL	Very Fine Sandy Loam	C	Clay
Si	Silt	SiC	Silty Clay
SiL	Silt Loam	HC	Heavy Clay
L	Loam	R	Bedrock

2.0 REFERENCES

- ASIC (Alberta Soil Information Centre). 2016. Alberta Soil Names File (Generation 4) User's Handbook. M.D. Bock (ed.). Agriculture and Agri-Food Canada, Science and Technology Branch, Edmonton, AB. 166 pp.
- CAESA (Canada – Alberta Environmentally Sustainable Agriculture Agreement). 2001. AGRASID Version 3.0: Soil Landscapes User's Manual. <https://www.alberta.ca/caesa-land-system-users-manual.aspx#toc-6>
- Expert Committee on Soil Survey. 1982. The Canada Soil Information System (CanSIS): Manual for Describing Soils in the Field, 1982 Revised. Land Resource Research Institute, Research Branch, Agriculture Canada, Ottawa. LRRRI Contribution no 82-52. 166 pp.
- SCWG (Soil Classification Working Group). 1998. The Canadian System of Soil Classification, 3rd ed. Agriculture and Agri-Food Canada Publication 1646, 187 pp.

APPENDIX D

Soil Abbreviations Key

1.0 DETAILED SOIL MAP UNIT DESCRIPTIONS AND REPRESENTATIVE PROFILES

The **Brownfield (BFD)** soil map unit is composed of well to moderately well drained Dark Brown Solonetz on moderately fine calcareous morainal till material. This map unit has low to high relief undulating topography, with slopes ranging from 2% to 5%.

The **Flagstaff (FST)** soil map unit is composed of well to moderately well drained Solonetzic Dark Brown Chernozems on moderately fine calcareous morainal till material. This map unit has level to low relief undulating topography, with slopes ranging from 0% to 5%.

The **Halkirk (HKR)** soil map unit is composed of well to moderately well drained Dark Brown Solodized Solonetz on moderately fine textured calcareous morainal till material. This map unit has level to low relief undulating topography, with slopes ranging from 0% to 5%.

The **Hughenden (HND)** soil map unit is composed of well to moderately well drained Orthic Dark Brown Chernozems on moderately fine textured, calcareous morainal till material. This map unit has low to high relief undulating topography, with slopes ranging from 0% to 5%.

The **Hughenden-calcareous (HNDca)** soil map unit is composed of well drained Calcareous Dark Brown Chernozems on moderately fine textured, calcareous glacial till material. The topsoil in this unit is more calcareous than the modal concept of the soil series. This map unit has low relief undulating topography, with slopes ranging from 0% to 5%.

The **Hughenden-coarse (HNDco)** soil map unit is composed of well drained Orthic Dark Brown Chernozems on medium to moderately coarse textured, calcareous glacial till material. This map unit has low relief undulating topography, with slopes ranging from 0% to 5%.

The **Hughenden-gleyed (HNDgl)** soil map unit is composed of moderately well to imperfectly drained Gleyed Dark Brown Chernozems on moderately fine textured, calcareous glacial till material. This map unit has low relief undulating topography, with slopes ranging from 0% to 5%.

The **Kyiscap (KCP)** soil map unit is composed of imperfectly drained Gleyed Humic Regosols on fine textured morainal till material. This map unit has low relief undulating topography, with slopes ranging from 0% to 5%.

The **Lanfine (LFE)** soil map unit is composed of well to imperfectly drained Eluviated Dark Brown Chernozems on moderately fine textured, calcareous morainal till material. This map unit has low relief undulating topography, with slopes ranging from 0% to 5%.

The **Onnevue (OVE)** soil map unit is composed of well to moderately well drained, weakly saline Solonetzic Dark Brown Chernozems on moderately fine textured, calcareous morainal till material. This map unit has shallow subsoil (B horizon) occurring within 20 cm of the soil surface. This map unit has low to high relief undulating topography, with slopes ranging from 0% to 5%.

The **Onnevue-gleyed (OVEgl)** soil map unit is composed of composed of imperfectly drained, weakly saline Gleyed Solonetzic Dark Brown Chernozems on moderately fine textured, calcareous morainal till material. This map unit has shallow subsoil (B horizon) occurring within 20 cm of the soil surface. This map unit has low relief undulating topography, with slopes ranging from 0% to 5%.

The **Sheerness (SHR)** soil map unit is composed of well to moderately well drained Dark Brown Solonetz on moderately fine textured, calcareous morainal till material. This till material overlies saline sodic marine softrock at 1 – 3 m in depth. This map unit has low to high relief undulating topography, with slopes ranging from 0% to 5%.

The **Sheerness-gleyed (SHRgl)** soil map unit is composed of moderately well to imperfectly drained Gleyed Dark Brown Solonetz on moderately fine textured, calcareous morainal till material. This till material overlies saline sodic marine softrock at 1 – 3 m in depth. This map unit has low relief undulating topography, with slopes ranging from 0% to 5%.

The **Foreman (FMN)** soil map unit is composed of poorly drained Humic Luvic Gleysols on moderately fine textured, calcareous morainal till material. This map unit has low relief undulating topography, with slopes ranging from 0% to 5%.

The **disturbed lands (ZDL)** soil map unit represents areas where natural soils have been disturbed, through road construction, ditching, or a combination of these factors.

The **miscellaneous gleysol (ZGL)** soil map unit represents areas where natural wetlands occur, and it is expected that soils within this map unit will be poorly drained soils comprised of various parent materials across the LOD. Soils within this map unit are all assumed to be of the Gleysol soil order, and all soil handling recommendations are based on soils with poor drainage with sensitive seed banks in the topsoil. No representative soil profile is available for this map unit.

2.0 DETAILED SOIL DATA

2.1 Brownfield Soil Map Unit

Table D-1: Representative Site Description – Brownfield Soil Map Unit

Subgroup and Series Classification	Dark Brown Solonetz: Brownfield (BFD)
Representative Map Unit(s)	BFD
Site Inspection ID	CH22DB048
Survey Date	8/28/2022
Location	436328 E; 5806400 N, UTM Zone 12, NAD83
Genetic Material	Morainal Till
Surface Expression	Low Relief, Undulating
Site Features	Well Drained
Sample Profile	Ap – 0 to 14 cm – Loam AB – 14 to 20 cm – Loam Bnt – 20 to 27 cm – Clay Loam Csk – 27 to 100 cm - Sandy Clay Loam

Notes:

See Attachment B for detailed profile horizon data.
cm = centimetres; UTM = Universal Transverse Mercator.

2.2 Flagstaff Soil Map Unit

Table D-2: Representative Site Description – Flagstaff Soil Map Unit

Subgroup and Series Classification	Solonetzic Dark Brown Chernozem: Flagstaff (FST)
Representative Map Unit(s)	FST
Site Inspection ID	CH22DB177
Survey Date	10/7/2022
Location	425229 E; 5807871 N, UTM Zone 12, NAD83
Genetic Material	Morainal Till
Surface Expression	Low Relief, Undulating
Site Features	Well Drained
Sample Profile	Ap – 0 to 14 cm - Loam Bnj – 14 to 39 cm – Sandy Clay Loam Csk – 39 to 100 cm – Clay Loam

Notes:

See Attachment B for detailed profile horizon data.
cm = centimetres; UTM = Universal Transverse Mercator.

2.3 Halkirk Soil Map Unit

Table D-3: Representative Site Description – Halkirk Soil Map Unit

Subgroup and Series Classification	Dark Brown Solodized Solonetz: Halkirk (HKR)
Representative Map Unit(s)	HKR
Site Inspection ID	CH22SB188
Survey Date	10/6/2022
Location	429175 E; 5808221 N, UTM Zone 12, NAD83
Genetic Material	Morainal Till
Surface Expression	Low Relief, Undulating
Site Features	Well Drained
Sample Profile	Ap – 0 to 13 cm – Loam Ae – 13 to 17 cm – Loam Bnt – 17 to 41 cm – Clay Loam Csk – 41 to 100 cm – Clay Loam

Notes:

See Attachment B for detailed profile horizon data.
cm = centimetres; UTM = Universal Transverse Mercator.

2.4 Hughenden Soil Map Unit

Table D-4: Representative Site Description – Hughenden Soil Map Unit

Subgroup and Series Classification	Orthic Dark Brown Chernozem: Hughenden (HND)
Representative Map Unit(s)	HND
Site Inspection ID	CH22DB109
Survey Date	8/26/2022
Location	437318 E; 5809198 N, UTM Zone 12, NAD83
Genetic Material	Morainal Till
Surface Expression	Low Relief, Undulating
Site Features	Well Drained
Sample Profile	Ap – 0 to 16 cm – Loam Bm – 16 to 40 cm – Sandy Loam Ck – 40 to 100 cm – Sandy Clay Loam

Notes:

See Attachment B for detailed profile horizon data.
cm = centimetres; UTM = Universal Transverse Mercator.

2.5 Hughenden-calcareous Soil Map Unit

Table D-5: Representative Site Description – Hughenden-calcareous Soil Map Unit

Subgroup and Series Classification	Calcareous Dark Brown Chernozem: Hughenden-calcareous (HNDca)
Representative Map Unit(s)	HNDca
Site Inspection ID	CH22DB088
Survey Date	8/26/2022
Location	437116 E; 5808495 N, UTM Zone 12, NAD83
Genetic Material	Morainal Till
Surface Expression	Low Relief, Undulating
Site Features	Well Drained
Sample Profile	Apk – 0 to 15 cm – Sandy Loam Bmk – 15 to 49 cm – Sandy Clay Loam Ck – 49 to 100 cm – Clay Loam

Notes:

See Attachment B for detailed profile horizon data.
cm = centimetres; UTM = Universal Transverse Mercator.

2.6 Hughenden-coarse Soil Map Unit

Table D-6: Representative Site Description – Hughenden-coarse Soil Map Unit

Subgroup and Series Classification	Orthic Dark Brown Chernozem: Hughenden-coarse (HNDco)
Representative Map Unit(s)	HNDco
Site Inspection ID	CH22DB089
Survey Date	8/26/2022
Location	436845 E; 5808498 N, UTM Zone 12, NAD83
Genetic Material	Morainal Till
Surface Expression	Low Relief, Undulating
Site Features	Well Drained
Sample Profile	Ap – 0 to 13 cm – Loam Bm – 13 to 39 cm – Sandy Loam Ck – 39 to 100 cm – Sandy Loam

Notes:

See Attachment B for detailed profile horizon data.
cm = centimetres; UTM = Universal Transverse Mercator.

2.7 Hughenden-gleyed Soil Map Unit

Table D-7: Representative Site Description – Hughenden-gleyed Soil Map Unit

Subgroup and Series Classification	Gleyed Dark Brown Chernozem: Hughenden-gleyed (HNDgl)
Representative Map Unit(s)	HNDgl
Site Inspection ID	CH22SB190
Survey Date	10/3/2022
Location	432517 E; 5808664 N, UTM Zone 12, NAD83
Genetic Material	Morainal Till
Surface Expression	Low Relief, Undulating
Site Features	Imperfect
Sample Profile	Ap – 0 to 16 cm – Loam Bm – 16 to 32 cm – Loam Ckg – 32 to 100 cm – Sandy Clay Loam

Notes:

See Attachment B for detailed profile horizon data.
cm = centimetres; UTM = Universal Transverse Mercator.

2.8 Kyiscap Soil Map Unit

Table D-8: Representative Site Description – Kyiscap Soil Map Unit

Subgroup and Series Classification	Gleyed Humic Regosol: Kyiscap (KCPaagIfi)
Representative Map Unit(s)	KCP
Site Inspection ID	CH22DB112a
Survey Date	8/26/2022
Location	435801 E; 5809314 N, UTM Zone 12, NAD83
Genetic Material	Morainal Till
Surface Expression	Low Relief, Undulating
Site Features	Imperfectly Drained
Sample Profile	Apk – 0 to 17 cm – Clay Loam Cskg – 17 to 100 cm – Clay

Notes:

See Attachment B for detailed profile horizon data.
cm = centimetres; UTM = Universal Transverse Mercator.

2.9 Lanfine Soil Map Unit

Table D-9: Representative Site Description – Lanfine Soil Map Unit

Subgroup and Series Classification	Eluviated Dark Brown Chernozem: Lanfine (LFE)
Representative Map Unit(s)	LFE
Site Inspection ID	CH22DB040
Survey Date	8/28/2022
Location	437755 E; 5806223 N, UTM Zone 12, NAD83
Genetic Material	Morainal Till
Surface Expression	Low Relief, Undulating
Site Features	Well Drained
Sample Profile	Ap – 0 to 14 cm – Loam Ae – 14 to 18 cm – Fine Sandy Loam Bm – 18 to 39 cm – Sandy Loam Ck – 39 to 100 cm – Clay Loam

Notes:

See Attachment B for detailed profile horizon data.
cm = centimetres; UTM = Universal Transverse Mercator.

2.10 Onnevue Soil Map Unit

Table D-10: Representative Site Description – Onnevue Soil Map Unit

Subgroup and Series Classification	Solonetzic Dark Brown Chernozem: Onnevue (OVE)
Representative Map Unit(s)	LFE
Site Inspection ID	CH22DB200
Survey Date	8/29/2022
Location	435793 E; 5805479 N, UTM Zone 12, NAD83
Genetic Material	Morainal Till
Surface Expression	Low Relief, Undulating
Site Features	Well Drained
Sample Profile	Ah – 0 to 10 cm – Loam AB – 10 to 19 cm – Loam Bnj – 19 to 39 cm – Sandy Clay Loam Csk – 39 to 100 cm – Clay Loam

Notes:

See Attachment B for detailed profile horizon data.
cm = centimetres; UTM = Universal Transverse Mercator.

2.11 Onnevue-gleyed Soil Map Unit

Table D-11: Representative Site Description – Onnevue-gleyed Soil Map Unit

Subgroup and Series Classification	Gleyed Solonetzic Dark Brown Chernozem: Onnevue-gleyed (OVEgl)
Representative Map Unit(s)	OVEgl
Site Inspection ID	CH22DBC181
Survey Date	10/7/2022
Location	424940 E; 5807976 N, UTM Zone 12, NAD83
Genetic Material	Morainal Till
Surface Expression	Low Relief, Undulating
Site Features	Moderately Well Drained
Sample Profile	Ap – 0 to 14 cm – Loam Bnjtgj – 14 to 34 cm – Clay Cskgj – 34 to 100 cm – Clay Loam

Notes:

See Attachment B for detailed profile horizon data.
cm = centimetres; UTM = Universal Transverse Mercator.

2.12 Sheerness Soil Map Unit

Table D-12: Representative Site Description – Sheerness Soil Map Unit

Subgroup and Series Classification	Dark Brown Solonetz: Sheerness (SHR)
Representative Map Unit(s)	SHR
Site Inspection ID	CH22SB214
Survey Date	10/3/2022
Location	430575 E; 5808671 N, UTM Zone 12, NAD83
Genetic Material	Morainal Till
Surface Expression	Low Relief, Undulating
Site Features	Well Drained
Sample Profile	Ap – 0 to 11 cm – Loam Bnt – 11 to 42 cm – Clay Loam Csk – 42 to 100 cm – Clay Loam

Notes:

See Attachment B for detailed profile horizon data.
cm = centimetres; UTM = Universal Transverse Mercator.

2.13 Sheerness-gleyed Soil Map Unit

Table D-13: Representative Site Description – Sheerness-gleyed Soil Map Unit

Subgroup and Series Classification	Gleyed Dark Brown Solonetz: Sheerness-gleyed (SHRgl)
Representative Map Unit(s)	SHRgl
Site Inspection ID	CH22SB180
Survey Date	10/4/2022
Location	427637 E; 5805233 N, UTM Zone 12, NAD83
Genetic Material	Morainal Till
Surface Expression	Low Relief, Undulating
Site Features	Moderately Well Drained
Sample Profile	Ap – 0 to 16 cm – Loam Bntjg – 16 to 42 cm – Clay Loam Cskgj – 42 to 100 cm – Clay Loam

Notes:

See Attachment B for detailed profile horizon data.
cm = centimetres; UTM = Universal Transverse Mercator.

2.14 Foreman Soil Map Unit

Table D-14: Representative Site Description – Foreman Soil Map Unit

Subgroup and Series Classification	Humic Luvic Gleysol: Foreman (FMNzeaa)
Representative Map Unit(s)	FMN
Site Inspection ID	CH22SB110a
Survey Date	10/2/2022
Location	430925 E; 5809187 N; UTM Zone 12, NAD83
Genetic Material	Morainal Till
Surface Expression	Low Relief, Undulating
Site Features	Poorly Drained
Sample Profile	Ap – 0 to 19 cm – Loam Aeg - 19 to 29 cm – Loam Btgk – 29 to 57 cm – Sandy Clay Loam Cskg – 57 to 100 cm – Clay Loam

Notes:

See Attachment B for detailed profile horizon data.
cm = centimetre; m = metre; UTM = Universal Transverse Mercator.

APPENDIX E

Soils and Terrain Field Inspection Data

Site	Drainage	Slope Percent	Slope Position	Surface Expression	Parent Material	Parent Material Code	Soil Subgroup Classification	Horizon	Thickness	Texture	Colour	Coarse Fragments (%)
CH22DB056	W	0	V	U1l	TILL	M4	DB.SO	Ap	13	L	10YR 3/2	0
								AB	9	L	10YR 4/3	0
								Bnt	11	CL	10YR 2/2	0
								Ck	67	CL	10YR 4/3	3
CH22DB026	MW	1	L	U1h	TILL	M4	SZ.DBC	Ap	13	L	10YR 3/2	0
								Bnjt	21	CL	10YR 3/2	0
								Ck	41	CL	10YR 5/3	1
								Ckgj	25	CL	10YR 5/3	1
CH22DB196	W	2	M	U1l	TILL	M4	O.DBC	Ap	15	L	10YR 4/2	0
								Bm	24	L	10YR 4/2	2
								Ck	61	CL	10YR 5/3	8
CH22DB195	W	4	M	U1h	TILL	M4	O.DBC	Ap	20	L	10YR 4/2	0
								Bm	22	L	10YR 4/2	2
								Ck	58	CL	10YR 5/3	5
CH22DB024	W	6	M	H1l	TILL	M4	O.DBC	Ap	15	L	10YR 4/2	1
								Bm	18	L	10YR 4/3	10
								Ck	67	CL	10YR 5/3	8
CH22DB197	W	3	L	U1h	TILL	M4	O.DBC	Ap	12	L	10YR 4/2	0
								Bm	23	L	10YR 4/2	2
								Ck	65	CL	10YR 5/3	3
CH22DB020	W	15	U	M1m	TILL	M4	CA.DBC	Ap	12	L	10YR 4/2	2
								Bmk	21	L	10YR 4/3	2
								Ck	67	SiL	10YR 6/2	2
CH22DB198	W	1	M	U1l	TILL	M4	SZ.DBC	Ah	17	L	10YR 4/2	0
								Bnjt	15	SCL	10YR 4/3	1
								Ck	68	CL	10YR 5/3	1
CH22DB014	W	2	U	U1l	TILL	M4	SZ.DBC	Ap	14	L	10YR 4/2	3
								Btjnj	25	CL	10YR 3/2	3
								Ck	61	CL	10YR 5/3	3
CH22DB013	W	4	M	U1h	TILL	M4	O.DBC	Ap	13	L	10YR 3/2	2
								Bm	20	L	10YR 4/2	2
								Ck	67	CL	10YR 4/3	2
CH22DBC70	W	1	U	U1h	GLFL/TILL	L2	O.DBC	Ap	15	LS	10YR 3/2	4
								Bm	32	LS	10YR 4/4	3
								Ck	53	S	10YR 3/4	5
								Ck	29	SCL	10YR 5/2	5
CH22DB112a	I	0	D	U1l	TILL	F4	GL.HR	Apk	17	CL	10YR 2/1	4
								Cskg	83	C	10YR 5/2	2
CH22DBC77	I	1	T	U1l	TILL	M4	GL.HR	Ah	32	L	10YR 2/1	3
								Cskg	68	CL	10YR 6/1	3
CH22DB126	W	0	V	U1l	TILL	M4	O.DBC	Ap	17	L	10YR 2/2	0
								Bm	25	SL	10YR 4/2	2
								Ck	58	SCL	10YR 4/2	5
CH22DB111	W	1	V	U1l	TILL	M4	O.DBC	Ap	14	L	10YR 2/2	1
								Bm	22	SCL	10YR 4/3	3
								Ck	86	CL	10YR 5/3	3
CH22DB172	W	1	V	U1l	TILL	M4	O.DBC	Ap	16	L	10YR 3/2	53
								Bm	15	SCL	10YR 4/3	53
								Ck	69	SCL	10YR 5/3	5
CH22DB171	W	0	V	L1	TILL	M4	O.DBC	Ap	12	L	10YR 3/1	1
								Bm	28	SL	10YR 4/3	2
								Ck	60	SCL	10YR 5/2	3

Site	Drainage	Slope Percent	Slope Position	Surface Expression	Parent Material	Parent Material Code	Soil Subgroup Classification	Horizon	Thickness	Texture	Colour	Coarse Fragments (%)
CH22DB112	W	2	M	U1l	TILL	M4	O.DBC	Ap	12	L	10YR 3/2	2
								Bm	33	SCL	10YR 4/2	5
								Ck	55	SCL	10YR 4/3	5
CH22DB109	W	1	U	U1l	TILL	M4	O.DBC	Ap	16	L	10YR 3/2	1
								Bm	24	SL	10YR 4/3	3
								Ck	60	SCL	10YR 5/3	6
CH22DB107	W	0	V	U1l	TILL	M4	O.DBC	Ap	17	L	10YR 2/2	2
								Bm	22	SL	10YR 3/4	3
								Ck	61	SCL	10YR 3/4	6
CH22DBC77A	W	4	M	H1l	TILL	M4	O.DBC	Ap	19	L	10YR 2/2	0
								Bm	32	SCL	10YR 3/3	0
								Ck1	14	SCL	10YR 5/3	5
								Ck2	35	LS	10YR 5/2	5
CH22DB091	W	1	V	U1l	TILL	M4	O.DBC	Ap	16	L	10YR 2/2	2
								Bm	27	L	10YR 3/2	3
								Ck	57	CL	10YR 4/2	3
CH22DB089	W	1	M	U1l	TILL	C5	O.DBC	Ap	13	L	10YR 3/2	1
								Bm	26	SL	10YR 4/2	1
								Ck	61	SL	10YR 5/3	2
CH22DBC65	I	1	T	U1h	TILL	F4	GL.DBC	Ap	11	L	10YR 3/2	0
								Bmgj	35	CL	10YR 4/2	2
								Ckg	54	C	10YR 5/3	3
CH22DB088	W	2	L	U1l	TILL	M4	CA.DBC	Apk	15	SL	10YR 2/2	3
								Bmk	34	SCL	10YR 2/2	3
								Ck	51	CL	10YR 4/3	5
CH22DB012	W	2	M	U1h	TILL	M4	SZ.DBC	Ap	14	L	10YR 2/2	2
								Bntj	28	L	10YR 4/3	2
								Ck	58	SCL	10YR 5/3	5
CH22DB210	W	2	V	U1l	TILL	M4	O.DBC	Ap	15	L	10YR 3/2	3
								Bm	25	L	10YR 4/3	3
								Ck	57	SCL	10YR 5/3	5
CH22DB209	R	1	T	U1h	TILL	M4	O.DBC	Ap	14	L	10YR 3/2	3
								Bm	24	SL	10YR 4/3	5
								Ck	62	LS	10YR 5/3	4
CH22DB208	W	0	V	U1l	TILL	M4	O.DBC	Ap	15	L	10YR 2/2	2
								Bm	25	SL	10YR 4/3	3
								Ck	85	SCL	10YR 5/3	5
CH22DBC87	W	3	U	U1h	TILL	M4	SZ.DBC	Ap	14	L	10YR 3/2	2
								Bnjtj	25	L	10YR 4/4	5
								Ck	61	SL	10YR 4/4	3
CH22DB011	W	5	U	U1h	TILL	M4	SZ.DBC	Ap	12	L	10YR 2/2	4
								AB	12	L	10YR 3/2	4
								Bntj	24	L	10YR 4/3	4
								Ck	52	CL	10YR 5/2	5
CH22DBC91	W	4	M	H1l	TILL	M4	O.DBC	Ap	24	L	10YR 3/2	2
								Bm	19	SL	10YR 4/3	2
								Ck	57	CL	10YR 5/3	2
CH22DB010	W	0	V	U1h	TILL	M4	SZ.DVC	Ap	14	L	10YR 2/2	3
								Bnjtj	23	SCL	10YR 4/4	5
								Ck	63	CL	10YR 5/4	5
CH22DB009	W	1	M	U1l	TILL	M4	DB.SO	Ap	10	L	10YR 2/2	3
								AB	17	L	10YR 4/2	2
								Bnt	18	CL	10YR 4/4	4
								Csk	55	CL	10YR 5/2	5

Site	Drainage	Slope Percent	Slope Position	Surface Expression	Parent Material	Parent Material Code	Soil Subgroup Classification	Horizon	Thickness	Texture	Colour	Coarse Fragments (%)
CH22DB006	W	4	L	U1h	TILL	M4	O.DBC	Ap	15	SCL	10YR 3/2	5
								Bm	26	SCL	10YR 4/4	5
								Ck	59	SCL	10YR 5/4	5
CH22DB005	W	1	V	U1l	TILL	C5	O.DBC	Ap	18	L	10YR 2/2	3
								Bm	19	L	10YR 3/3	2
								C	73	SL	10YR 4/4	1
CH22DB004	W	0	V	U1l	TILL	M4	O.DBC	Ap	13	L	10YR 2/2	2
								Bm	27	CL	10YR 3/3	2
								Ck	60	SCL	10YR 4/3	5
CH22DB003	W		V	U1l	TILL	M4	SZ.DBC	Ap	14	L	10YR 3/2	5
								Bnjtj	23	SCL	10YR 3/3	5
								Ck	63	CL	10YR 4/2	5
CH22DB002	W	1	M	U1l	TILL	M4	SZ.DBC	Ap	18	L	10YR 3/2	1
								Ae	7	L	10YR 5/3	0
								Bnjt	24	SCL	10YR 5/4	0
								Ck	51	SCL	10YR 5/3	5
CH22DB048	W	2	M	U1l	TILL	M4	DB.SO	Ap	14	L	10YR 3/2	3
								AB	6	L	10YR 3/2	3
								Bnt	7	CL	10YR 4/2	3
								Ck	73	SCL	10YR 5/4	5
CH22DB203	W	1	L	L1	TILL	M4	SZ.DBC	Ap	16	L	10YR 2/2	4
								AB	8	L	10YR 4/2	4
								Bnj	17	SCL	10YR 4/3	3
								Ck	59	CL	10YR 4/4	5
CH22DB027	W	0	V	U1l	TILL	M4	DB.SS	Ap	20	L	10YR 2/2	3
								Ae	5	L	10YR 6/2	3
								Bnt	18	SCL	10YR 4/2	2
								Ck	57	SCL	10YR 4/4	3
CH22DB023	I		V	L1	TILL	M4	GLSZ.DBC	Ap	15	L	10YR 2/2	2
								AB	18	SiL	10YR 3/2	2
								Bnjtj	13	SCL	10YR 5/2	3
								Ckg	54	SCL	10YR 5/4	8
CH22DB215	W	1	V	U1l	TILL	M4	O.DBC	Ap	14	L	10YR 2/2	4
								Bm	20	SCL	7.5YR 4/4	4
								Ck	66	SCL	10YR 5/3	5
CH22DB032	W	3	M	U1h	TILL	M4	O.DBC	Ap	15	L	10YR 2/2	3
								Bm	21	L	10YR 4/2	3
								BC	49	CL	10YR 4/4	4
								Ck	15	CL	10YR 4/4	5
CH22DB204	W	4	M	H1l	TILL	M4	O.DBC	Ap	16	L	10YR 2/2	3
								Bm	21	L	10YR 4/2	3
								BC	53	SL	10YR 4/4	2
								Ck	10	SCL	10YR 4/4	8
CH22DBC135	W	5	M	H1m	TILL	M4	O.DBC	Ah	18	L	10YR 2/2	3
								Bm	20	SL	10YR 2/2	3
								BC	27	SL	10YR 2/2	3
								Ck	35	CL	10YR 4/3	5
CH22DB033	W	2	L	U1l	TILL	M4	O.DBC	Ap	17	L	10YR 2/2	2
								Bm	28	L	10YR 4/3	2
								Ck	55	CL	10YR 4/4	1
CH22DB206	W	0	V	U1h	TILL	M4	SZ.DBC	Ap	21	L	10YR 2/2	2
								Ae	11	CL	10YR 5/1	2
								Bnt	12	CL	10YR 4/3	2
								Ck	56	CL	10YR 6/3	1

Site	Drainage	Slope Percent	Slope Position	Surface Expression	Parent Material	Parent Material Code	Soil Subgroup Classification	Horizon	Thickness	Texture	Colour	Coarse Fragments (%)
CH22DB045	W	1	M	U1l	TILL	M4	O.DBC	Ap	14	L	10YR 2/1	1
								AB	16	L	10YR 3/2	1
								Bm	21	L	10YR 3/3	2
								Ck	49	CL	10YR 5/3	1
CH22DB207	W	1	L	U1l	TILL	M4	SZ.DBC	Ap	17	L	10YR 3/2	2
								Bnj	24	SL	10YR 4/3	2
								Ck	59	CL	10YR 5/3	3
CH22DBC129	W	5	M	U1h	GLFL/TILL	L2	O.DBC	Ap	16	SL	10YR 2/2	8
								Bm	21	SL	10YR 2/2	5
								BC	31	SCL	10YR 4/3	2
								Ck	32	CL	10YR 4/4	5
CH22DB028	I	2	L	U1l	TILL	M4	GLE.DBC	Ap	13	L	10YR 2/2	4
								Aegj	11	L	10YR 4/2	5
								Bmgj	18	CL	10YR 4/3	5
								Ckg	58	CL	10YR 5/2	5
CH22DB218	I	0	V	U1l	TILL	M4	GLE.DBC	Ap	16	L	10YR 2/2	0
								Ae	10	SiL	10YR 6/2	1
								Bmgj	19	L	10YR 4/3	1
								Ckg	55	CL	10YR 5/2	3
CH22DB211	I	1	L	U1l	TILL	F4	GLE.DBC	Ap	16	L	10YR 2/2	1
								Aegj	10	L	10YR 6/1	1
								Btgj	12	C	10YR 4/2	0
								Ckg	62	C	10YR 3/3	0
CH22DB040	W	2	M	U1l	TILL	M4	E.DBC	Ap	14	L	10YR 2/2	3
								Ae	4	FSL	10YR 5/3	3
								Bm	21	SL	10YR 4/4	2
								Ck	61	CL	10YR 5/4	1
CH22DBC141	W	2	U	U1l	TILL	M4	O.DBC	Ap	22	L	10YR 2/2	2
								Bm	16	SL	10YR 4/2	2
								BC	49	SL	10YR 4/1	1
								Ck	13	CL	10YR 5/4	5
CH22DBC105	MW	1	L	U1l	TILL	M4	DB.SO	Ah	10	L	10YR 2/2	4
								AB	6	L	10YR 3/2	4
								Bnt	8	CL	10YR 4/2	4
								Ck	76	CL	10YR 5/3	5
CH22DB201	W	2	L	U1l	TILL	M4	SZ.DBC	Ah	13	L	10YR 2/2	3
								AB	9	L	10YR 3/2	3
								Bnj	14	SCL	10YR 4/2	3
								Ck	64	CL	10YR 5/4	4
CH22DB200	W	0	V	U1l	TILL	M4	SZ.DBC	Ah	10	L	10YR 2/2	1
								AB	9	L	10YR 3/2	1
								Bnj	20	SCL	10YR 3/2	3
								Ck	61	CL	10YR 4/4	3
CH22DB017	W	4	M	U1h	TILL	M4	DB.SZ	Ah	14	L	10YR 2/2	5
								Bnt	20	CL	10YR 4/2	5
								Ck	66	CL	10YR 5/4	5
CH22DB150	I	0	D	L2	TILL	F4	DB.SZ	Ah	15	L	10YR 3/2	1
								Bnt	20	CL	10YR 2/1	1
								Ckgj	65	C	10YR 3/2	1
CH22DB202	W	2	M	U1l	TILL	M4	SZ.DBC	Ah	10	L	10YR 2/2	1
								AB	5	L	10YR 4/2	
								Bnj	21	L	10YR 4/3	2
								Ck	64	CL	10YR 4/4	4

Site	Drainage	Slope Percent	Slope Position	Surface Expression	Parent Material	Parent Material Code	Soil Subgroup Classification	Horizon	Thickness	Texture	Colour	Coarse Fragments (%)
CH22SBC53	W	1	U	U1l	TILL	M4	DB.SS	Ap	14	L	10YR 3/2	2
								Ae	5	L	10YR 5/1	3
								Bnt	20	CL	10YR 3/2	3
								Ck	61	CL	10YR 5/3	3
CH22SB087	W	1	M	U1l	TILL	M4	DB.SZ	Ap	13	L	10YR 3/2	5
								Bnt	24	CL	10YR 3/3	5
								Ck	63	SCL	10YR 5/2	5
CH22SB193	I	2	L	U1l	TILL	M4	GL.DBC	Ap	16	L	10YR 3/2	5
								Bm	13	SCL	10YR 4/2	5
								Ckg	71	SCL	10YR 4/3	5
CH22SB093	I	2	T	U1l	TILL	F4	GL.DBC	Ap	19	L	10YR 2/2	0
								Bm	25	CL	10YR 2/2	0
								Ckg	56	C	10YR 2/2	0
CH22SB194	W	1	M	U1l	TILL	M4	O.DBC	Ap	18	L	10YR 3/2	5
								Bm	22	L	10YR 4/3	3
								BC	28	L	10YR 6/4	0
								Ck	32	CL	10YR 5/4	5
CH22SB157	W	1	V	U1l	TILL	M4	DB.SS	Ap	14	L	10YR 3/2	3
								Ae	3	L	10YR 4/1	3
								Bnt	21	CL	10YR 3/2	3
								Ck	62	CL	10YR 5/2	3
CH22SB094	MW	1	M	U1l	TILL	F4	O.DBC	Ap	17	L	10YR 3/2	1
								AB	24	L	10YR 4/2	1
								Bm	9	L	10YR 3/2	2
								Ck	50	C	10YR 3/2	1
CH22SB190	I	0	D	U1l	TILL	M4	GL.DBC	Ap	16	L	10YR 3/2	2
								Bm	16	L	10YR 4/3	2
								Ckg	68	SCL	10YR 6/2	2
CH22SB095	W	1	M	U1l	TILL	M4	O.DBC	Ap	16	L	10YR 3/2	3
								Bm	15	L	10YR 4/3	3
								Ck	69	L	10YR 5/3	3
CH22SB161	P	0	D	U1h	TILL	M4	O.HG	Ap	15	L	10YR 3/2	2
								Bmgj	23	L	10YR 3/2	2
								Ckg	62	CL	10YR 3/1	2
CH22SB110a	P		D	U1l	TILL	M4	HU.LG	Ap	19	L	10YR 3/2	0
								Aeg	10	L	10YR 6/2	1
								Btgk	28	SCL	10YR 5/2	2
								Ckg	43	CL	10YR 4/2	5
CH22SB214	W	2	M	U1h	TILL	M4	DB.SZ	Ap	11	L	10YR 3/2	3
								Bnt	31	CL	10YR 2/2	3
								Ck	58	CL	10YR 4/3	5
CH22SB096	W	1	U	U1l	TILL	M4	DB.SZ	Ap	13	L	10YR 4/2	3
								Bnt	17		10YR 3/1	3
								Ck	70	CL	10YR 5/2	
CH22SBC169	W	2	L	U1l	TILL	M4	SZ.DBC	Ap	11	L	10YR 3/2	3
								AB	7	L	10YR 4/2	3
								Bnjtj	14	CL	10YR 3/2	4
								Ck	68	CL	10YR 4/4	8
CH22SB017	W	3	L	U1h	TILL	M4	DB.SS	Ap	17	L	10YR 3/2	2
								Ae	5	L	10YR 5/2	2
								Bnt	20	CL	10YR 4/3	2
								Ck	58	CL	10YR 4/4	2

Site	Drainage	Slope Percent	Slope Position	Surface Expression	Parent Material	Parent Material Code	Soil Subgroup Classification	Horizon	Thickness	Texture	Colour	Coarse Fragments (%)
CH22SB108	W	0	V	U1l	TILL	M4	DB.SO	Ap	19	L	10YR 3/2	2
								Ae	11	L	10YR 5/2	2
								Bnt	16	CL	10YR 2/2	2
								Ck	54	CL	10YR 5/3	2
CH22DBC165	W	1	V	U1l	TILL	M4	DB.SZ	Ap	10	L	10YR 4/2	4
								Bnt	26	CL	10YR 3/2	5
								Ck	26	CL	10YR 5/3	6
CH22SB037	W	10	M	U1h	TILL	M4	O.DBC	Ap	17	L	10YR 3/2	5
								Bm	21	SL	10YR 4/2	5
								BC	30	CL	10YR 4/2	5
								Ck	32	LS	10YR 4/3	3
CH22SB016	W	0	V	U1l	TILL	M4	DB.SZ	Ap	11	L	10YR 3/2	2
								Bnt	24	CL	10YR 4/3	2
								Ck	65	CL	10YR 5/3	3
CH22SB180	MW	0	V	U1l	TILL	M4	GLDB.SZ	Ap	16	L	10YR 3/2	3
								Bntiji	26	CL	10YR 5/3	3
								Ckgj	58	CL	10YR 5/4	3
CH22SB015	W	0	V	U1l	TILL	M4	DB.SO	Ap	12	L	10YR 4/2	5
								AB	18	SL	10YR 5/3	5
								Bnt	19	SCL	10YR 4/3	5
								Ck	51	CL	10YR 5/3	3
CH22SB041	MW	3	L	U1h	TILL	M4	DB.SZ	Ap	13	L	10YR 2/2	3
								Bnt	19	CL	10YR 3/2	3
								Ck	14	CL	10YR 3/2	3
CH22SB052	W	1	M	U1l	TILL	M4	DB.SO	Ap	13	L	10YR 2/2	3
								AB	14	L	10YR 3/2	3
								Bnt	18	CL	10YR 4/3	3
								BC	9	CL	10YR 5/3	3
								Ck	46	CL	10YR 5/3	5
CH22SB051	W	1	M	U1l	TILL	M4	O.DBC	Ap	13	L	10YR 2/2	2
								Bm	20	L	10YR 4/3	2
								BC	19	CL	10YR 4/3	2
								Ck	67	CL	10YR 4/3	2
CH22SB049	W	2	M	U1l	TILL	C5	O.DBC	Ap	14	L	10YR 2/2	8
								Bm	17	L	10YR 4/3	20
								Ck	69	SL	10YR 4/3	5
CH22SB030	MW	0	D	U1l	TILL	F4	GL.DBC	Ap	14	CL	10YR 3/1	2
								Bmgj	18	C	10YR 3/2	0
								Ckgj	68	C	10YR 3/1	0
CH22SB021	W	2	M	U1l	TILL	M4	O.DBC	Ap	17	L	10YR 2/2	4
								Bm	21	CL	10YR 3/3	4
								BC	16	CL	10YR 4/2	4
								Ck	46	CL	10YR 4/2	4
CH22SBC61	W	2	U	U1l	TILL	M4	SZ.DBC	Ap	12	L	10YR 3/2	4
								Bnj	26	CL	10YR 5/3	4
								Ck	62	CL	10YR 5/2	4
CH22SBC153	W	0	V	U1l	TILL	M4	O.DBC	Ap	15	L	10YR 2/2	2
								Bm	19	L	10YR 3/3	2
								BC	19	L	10YR 4/3	2
								Ck	47	L	10YR 4/3	2
CH22SBC1	W	0	V	U1l	TILL	M4	SZ.DBC	Ap	11	L	10YR 3/2	4
								Btnj	29	CL	10YR 3/3	10
								BC	26	CL	10YR 5/3	5
								Ck	60	CL	10YR 5/3	5

Site	Drainage	Slope Percent	Slope Position	Surface Expression	Parent Material	Parent Material Code	Soil Subgroup Classification	Horizon	Thickness	Texture	Colour	Coarse Fragments (%)
CH22DB053	W	1	L	U1l	TILL	M4	DB.SS	Ap	13	L	10YR 3/2	2
								Ae	9	SL	10YR 5/2	3
								Bnt	22	SCL	10YR 4/3	3
								Ck	56	SCL	10YR 5/3	5
CH22DB046	W	2	U	U1l	TILL	M4	SZ.DBC	Ap	15	L	10YR 3/2	2
								Bnj	24	SCL	10YR 4/3	6
								Ck	61	SCL	10YR 5/3	5
CH22DB047	W	2	M	U1l	TILL	M4	O.DBC	Ap	14	SL	10YR 3/2	6
								Bm	17	SL	10YR 2/2	6
								Ck	69	SCL	10YR 5/3	6
CH22DB044	MW	0	T	L1	TILL	F4	GL.DBC	Ap	10	L	10YR 3/2	1
								Bmgj	22	C	10YR 2/2	0
								Ckgj	68	C	10YR 5/3	4
CH22DB042	W	5	C	U1h	TILL	M4	O.DBC	Ap	15	L	10YR 3/2	10
								Bm	25	SL	10YR 4/3	8
								Ck	60	CL	10YR 5/2	6
CH22DB031	W	4	M	U1h	TILL	M4	DB.SZ	Ap	10	SCL	10YR 3/2	3
								Bnt	16	CL	10YR 2/2	3
								Ck	74	CL	10YR 5/3	5
CH22DB036	W	4	L	U1h	TILL	M4	O.DBC	Ap	21	L	10YR 3/2	1
								Bm	22	L	10YR 3/3	2
								BC	12	L	10YR 4/3	1
								Ck	45	CL	10YR 5/3	5
CH22DB035	I	0	V	L1	TILL	M4	O.DBC	Ap	12	L	10YR 3/2	1
								Bmgj	23	C	10YR 2/2	0
								Ckgj	65	CL	10YR 5/2	5
CH22DB038	W		V	L1	TILL	M4	SZ.DBC	Ap	12	L	10YR 3/2	5
								Bnj	19	CL	10YR 4/3	5
								Ck	69	CL	10YR 5/2	5
CH22DB034	W	2	T	U1l	TILL	M4	SZ.DBC	Ap	14	L	10YR 3/2	5
								Btnj	25	SCL	10YR 4/3	5
								BC	6	SCL	10YR 4/4	8
CH22SB019	W	0	V	U1l	TILL	M4	SZ.DBC	Ap	12	L	10YR 3/2	3
								Bnj	28	SCL	10YR 3/3	5
								Ck	60	CL	10YR 5/3	3
CH22SB022	MW	2	L	U1l	TILL	M4	GL.DBC	Ap	15	L	10YR 2/2	2
								Aegj	16	L	10YR 5/2	2
								Btgj	19	CL	10YR 4/3	2
								Ckg	69	CL	10YR 5/3	5
CH22SBC99	W	2	M	U1l	TILL	M4	DB.SZ	Ap	13	L	10YR 2/2	5
								Bntj	21	CL	10YR 4/3	5
								Ck	66	CL	10YR 5/3	5
CH22SBC98	W	1	U	U1l	TILL	M4	O.DBC	Ap	18	L	10YR 2/2	3
								Bm	20	L	10YR 4/3	3
								Ck	62	CL	10YR 4/3	5
CH22SB050	MW	2	D	U1l	GLLC	F1	GLSZ.DBC	Ap	10	L	10YR 2/2	0
								AB	8	L	10YR 2/2	0
								Bnjgj	24	C	10YR 2/2	0
								Ckgj	58	C	10YR 2/2	0
CH22SB179	W	0	V	U1l	TILL	M4	SZ.DBC	Ap	12	L	10YR 3/2	5
								Bnjtj	23	SCL	10YR 4/2	5
								Ck	65	CL	10YR 4/3	5
CH22SBC10	W	1	L	U1l	TILL	M4	DB.SO	Ap	10	L	10YR 3/2	3
								AB	9	L	10YR 3/2	3
								Bnt	20		10YR 3/3	
								Ck	61	CL	10YR 5/3	3

Site	Drainage	Slope Percent	Slope Position	Surface Expression	Parent Material	Parent Material Code	Soil Subgroup Classification	Horizon	Thickness	Texture	Colour	Coarse Fragments (%)
CH22DB076	MW	1	M	U1l	TILL	M4	DB.SS	Ap	13	SIL	10YR 3/2	2
								Ar	7	L	10YR 4/1	3
								Bnt	11	CL	10YR 3/2	3
								Ck	69	CL	10YR 4/2	3
CH22DB082	W	0	V	U1l	TILL	M4	DB.SO	Ap	13	L	10YR 2/2	2
								AB	8	L	10YR 4/3	2
								Bnt	13	CL	10YR 4/3	2
								Ck	61	CL	10YR 5/3	5
CH22DB075	W	3	M	U1h	TILL	M4	SZ.DBC	Ap	10	L	10YR 2/2	5
								Bnj	23	CL	10YR 4/2	5
								Ck	67	CL	10YR 4/2	5
CH22DB073	W	2	U	U1l	TILL	M4	O.DBC	Ap	14	L	10YR 2/2	5
								Bm	23	SCL	10YR 4/3	5
								Ck	63	CL	10YR 5/3	5
CH22DB113	W	1	V	U1l	TILL	M4	SZ.DBC	Ap	13	L	10YR 3/2	2
								AB	10	L	10YR 4/3	2
								Bnjtj	17	CL	10YR 3/2	2
								Ck	60	CL	10YR 5/3	2
CH22DBC181	I	0	V	U1l	TILL	M4	GLSZ.DBC	Ap	14	L	10YR 3/2	2
								Bnjtgj	20	C	10YR 3/3	2
								Ckgj	66	CL	10YR 5/3	4
CH22DB072	W	1	M	U1l	TILL	M4	SZ.DBC	Ap	15	L	10YR 2/2	5
								AB	5	L	10YR 4/2	5
								Bnjtj	19	L	10YR 3/2	5
								Ck	61	CL	10YR 4/3	5
CH22DB177	W	1	M	U1l	TILL	M4	SZ.DBC	Ap	14	L	10YR 2/2	3
								Bnj	25	SCL	10YR 4/3	3
								Ck	61	CL	10YR 5/2	3
CH22DB174	W	0	V	U1l	TILL	M4	DB.SZ	Ap	14	L	10YR 2/2	3
								Bnt	20	CL	10YR 3/2	4
								Ck	66	SCL	10YR 4/3	4
CH22DB081	W	2	M	U1l	TILL	M4	O.DBC	Ap	15	L	10YR 2/2	4
								Bm	21	L	10YR 4/2	4
								Ck	64	CL	10YR 5/2	5
CH22DB173	W	2	M	U1l	TILL	M4	DB.SO	Ap	13	L	10YR 3/1	3
								AB	10	L	10YR 5/2	3
								Bnt	13	CL	10YR 4/2	3
								Ck	64	C	10YR 4/3	1
CH22DBC210	W	0	V	L1	TILL	M4	O.DBC	Ap	10	L	10YR 3/1	5
								Bm	28	CL	10YR 4/3	5
								Ck	62	CL	10YR 4/4	5
CH22DB064	W	0	V	U1l	TILL	M4	DB.SS	Ap	12	L	10YR 3/2	3
								Ae	10	L	10YR 5/1	3
								Bnt	6	CL	10YR 4/3	3
								Ck	72	CL	10YR 5/4	3
CH22DB066	W	0	V	U1h	TILL	M4	O.DBC	Ap	20	L	10YR 3/2	1
								AB	10	L	10YR 4/2	1
								Bm	29	L	10YR 4/2	1
								BC	18	L	10YR 4/2	1
								Ck	40	CL	10YR 4/3	5
CH22DB185	W	1	C	U1l	TILL	M4	SZ.DBC	Ap	7	L	10YR 3/2	4
								Bnjtj	19	C	10YR 3/2	4
								Ck	74	CL	10YR 3/4	

Site	Drainage	Slope Percent	Slope Position	Surface Expression	Parent Material	Parent Material Code	Soil Subgroup Classification	Horizon	Thickness	Texture	Colour	Coarse Fragments (%)
CH22SB039	W	3	M	U1h	TILL	M4	O.DBC	Ap	14	L	10YR 3/2	5
								Bm	19	L	10YR 4/3	5
								BC	17	CL	10YR 4/3	3
								Ck	50	CL	10YR 5/3	3
CH22SB178	W	1	V	U1l	TILL	M4	O.DBC	Ap	22	L	10YR 3/2	2
								Bm	14	L	10YR 4/3	2
								BC	64	SCL	10YR 4/3	2
								Ck	30	SC	10YR 5/2	5
CH22SB059	W	1	M	U1l	TILL	M4	O.DBC	Ap	19	L	10YR 2/2	2
								Bm	12	L	10YR 3/3	2
								Ck	69	L	10YR 5/3	1
CH22SB063	W	4	U	U1h	TILL	M4	SZ.DBC	Ap	12	L	10YR 2/2	5
								AB	7	L	10YR 2/2	5
								Bnk	17	SCL	10YR 5/3	5
								Ck	64	CL	10YR 5/3	5
CH22SBC188	W	3	M	U1h	TILL	M4	SZ.DBC	Ap	14	L	10YR 2/2	3
								Bnj	17	CL	10YR 4/2	3
								BC	14	CL	10YR 4/3	3
								Ck	55	CL	10YR 4/3	3
CH22SB058	W	0	V	U1l	TILL	M4	O.DBC	Ap	17	L	10YR 2/2	2
								Bm	12	CL	10YR 4/2	3
								Ck	71	CL	10YR 4/3	3
CH22SB060	MW	2	L	U1l	TILL	M4	GL.DBC	Ap	16	L	10YR 2/2	5
								Bm	17	L	10YR 4/3	5
								Ck	17	CL	10YR 3/3	5
								Ckgj	50	CL	10YR 4/3	5
CH22SB055	W	2	M	U1l	TILL	M4	DB.SS	Ap	17	L	10YR 3/2	3
								Ae	9	L	10YR 6/3	3
								Bnt	17	CL	10YR 3/1	1
								Ck	57	CL	10YR 4/3	3
CH22SB186	W	1	M	U1l	TILL	M4	SZ.DBC	Ap	15	L	10YR 3/2	3
								Bnj	20	L	10YR 5/3	3
								Ck	65	CL	10YR 5/3	6
CH22SB061	W	1	L	U1l	TILL	M4	DB.SZ	Ap	15	L	10YR 3/2	5
								Bnt	24	CL	10YR 4/2	2
								Ck	65	CL	10YR 5/3	5
CH22SB205	W	4	M	H1l	TILL	M4	SZ.DBC	Ap	13	L	10YR 3/1	5
								Bnj	23	CL	10YR 4/2	5
								Ck	64	CL	10YR 5/2	5
CH22SB069	W	4	C	H1l	TILL	M4	O.DBC	Ap	12	L	10YR 3/2	8
								Bm	14	LS	7.5YR 4/3	15
								BC	13	CL	10YR 5/3	5
								Ck	61	LS	10YR 6/1	5
CH22SB067	P	2	D	H1l	TILL	M4	HU.LG	Ap	13	L	10YR 3/2	2
								Aegj	15	L	10YR 6/2	2
								Btg	17	CL	10YR 5/2	1
								Ckg	55	CL	10YR 5/3	4
CH22SB102	W	3	M	U1h	TILL	M4	O.DBC	Ap	24	L	10YR 2/2	4
								Bm	18	L	10YR 4/3	5
								Ck	58	CL	10YR 5/3	6
CH22SB101	W	2	U	U1l	TILL	M4	DB.SO	Ap	24	L	10YR 2/2	3
								AB	13	L	10YR 4/3	1
								Bnt	22	CL	10YR 3/2	2
								Ck	54	CL	10YR 5/3	5

Site	Drainage	Slope Percent	Slope Position	Surface Expression	Parent Material	Parent Material Code	Soil Subgroup Classification	Horizon	Thickness	Texture	Colour	Coarse Fragments (%)
CH22SB103	W	1	M	U1I	TILL	M4	O.DBC	Ap	14	L	10YR 3/1	3
								Bm	29	L	10YR 3/2	3
								Ck	57	L	10YR 3/3	3
CH22SB212	W	2	L	U1I	TILL	M4	SZ.DBC	Ap	17	L	10YR 3/2	5
								Bnj	19	CL	10YR 3/1	5
								Ck	64	CL	10YR 5/3	5
CH22SB104	W	1	M	U1I	TILL	M4	DB.SZ	Ap	16	L	10YR 2/2	3
								Bnt	18	CL	10YR 3/2	3
								Ck	66	CL	10YR 5/3	5
CH22SBC80	I	1	T	U1I	TILL	M4	GLSZ.DBC	Ap	14	L	10YR 2/2	4
								Bnjtgj	29	SCL	10YR 4/3	2
								Ckgj	57	CL	10YR 5/3	5
CH22SBC223	W	1	M	U1I	TILL	M4	DB.SS	Ah	12	L	10YR 2/2	2
								Ae	10	L	10YR 5/2	2
								Bnt	21	CL	10YR 5/2	2
								Ck	57	CL	10YR 6/3	6
CH22SBC83	W	0	V	U1I	TILL	M4	SZ.DBC	Ap	14	L	10YR 3/2	2
								Ae	12	L	10YR 5/2	2
								Bnjt	21	SCL	10YR 4/2	2
								Ck	53	CL	10YR 4/3	5
CH22SB084	W	5	M	U1h	TILL	M4	SZ.DBC	Ap	18	L	10YR 3/2	2
								AB	17	L	10YR 3/2	2
								Bnj	20	L	10YR 5/3	2
								Ck	45	CL	10YR 5/3	
CH22SB189	W	2	U	U1I	TILL	M4	O.DBC	Ap	18	L	10YR 2/2	2
								Bm	24	L	10YR 4/3	2
								Ck	58	CL	10YR 5/3	2
CH22SBC33	W	0	V	L1	TILL	M4	SZ.DBC	Ap	19	L	10YR 2/2	2
								Bnj	12	CL	10YR 4/2	2
								Ck	69	CL	10YR 4/3	2
CH22SB085	W	1	M	U1I	TILL	M4	DB.SO	Ap	15	L	10YR 2/2	2
								AB	14	L	10YR 5/2	2
								Bnt	12	CL	10YR 2/2	2
								Ck	58	CL	10YR 5/3	2
CH22SB188	W	1	V	U1I	TILL	M4	DB.SS	Ap	13	L	10YR 2/2	3
								Ae	4	L	10YR 6/2	3
								Bnt	24	CL	10YR 4/2	3
								Ck	59	CL	10YR 4/3	3
CH22SB083	MW	0	V	U1I	TILL	M4	GL.DBC	Ap	16	L	10YR 3/1	1
								Bm	22	L	10YR 3/1	1
								Ckgj	62	SCL	10YR 4/3	3
CH22SB079	W	4	M	IUI	TILL	M4	SZ.DBC	Ap	14	L	10YR 3/2	2
								AB	10	L	10YR 4/2	2
								Bnjt	18	CL	10YR 4/3	4
								Ck	68	CL	10YR 5/3	8
CH22SB187	W	1	M	U1I	TILL	M4	DB.SZ	Ap	11	SL	10YR 3/2	8
								Bnt	19	CL	10YR 4/3	5
								Ck	70	SCL	10YR 5/3	5
CH22SB070	I	0	T	U1I	TILL	M4	GL.DBC	Ap	10	L	10YR 2/2	3
								Bnjtj	10	CL	10YR 3/1	3
								Ckgj	80	CL	10YR 4/3	4

Site	Drainage	Slope Percent	Slope Position	Surface Expression	Parent Material	Parent Material Code	Soil Subgroup Classification	Horizon	Thickness	Texture	Colour	Coarse Fragments (%)
CH22SB183	I	1	T	U1h	TILL	F4	DB.SS	Ap	15	L	10YR 3/2	2
								Ae	8	L	10YR 5/1	2
								Bntgj	16	CL	10YR 3/3	2
								Ckgj	77	C	10YR 3/1	4
CH22SB068	W	1	M	U1l	TILL	M4	DB.SZ	Ap	15	L	10YR 3/2	5
								Bnt	25	CL	10YR 3/2	5
								Ck	60	CL	10YR 4/3	5
CH22SBC36	W	0	V	U1l	TILL	M4	DB.SS	Ap	23	L	10YR 3/2	2
								Ae	6	L	10YR 5/2	3
								Bnt	12	CL	10YR 4/3	2
								Ck	59	CL	10YR 5/3	5
CH22SBC39	W	2	M	U1l	TILL	M4	O.DBC	Ap	11	L	10YR 3/1	4
								Bm	15	L	10YR 4/3	4
								BC	34	CL	10YR 4/2	2
								Ck	40	CL	10YR 4/2	4
CH22SB054	W	1	U	U1l	TILL	M4	DB.SO	Ap	13	L	10YR 3/2	3
								AB	13	L	10YR 4/3	3
								Bnt	16	SCL	10YR 3/2	3
								Ck	58	CL	10YR 5/3	3
CH22SB213	W	0	V	L1	TILL	M4	SZ.DBC	Ap	12	L	10YR 3/2	2
								Bnj	26	CL	10YR 3/2	2
								Ck	62	CL	10YR 4/2	2
CH22SB074	MW		V	U1l	TILL	F4	SZ.DBC	Ap	15	L	10YR 3/2	2
								Bnjt	19	C	10YR 3/3	2
								Ck	66	C	10YR 3/3	1
CH22SB176	W	1	M	U1l	TILL	M4	SZ.DBC	Ap	13	L	10YR 3/2	2
								Bnj	17	CL	10YR 3/2	2
								Ck	70	CL	10YR 5/3	2
CH22SB078	W	1	M	U1l	TILL	M4	SZ.DBC	Ap	14	L	10YR 2/2	2
								Ae	5	L	10YR 5/1	2
								Bnjt	15	C	10YR 3/2	2
								Ck	66	CL	10YR 4/3	2
CH22SBC4	W	1	M	U1l	TILL	M4	O.DBC	Ap	14	L	10YR 2/2	2
								Btj	23	SCL	10YR 3/2	2
								Ck	63	CL	10YR 4/3	2
CH22SB099	W	1	M	U1l	TILL	M4	DB.SS	Ap	13	L	10YR 3/2	2
								Bnt	17	CL	10YR 4/2	2
								Ck	70	CL	10YR 5/3	4
CH22SB098	W	1	L	U1l	TILL	M4	O.DBC	Ap	17	L	10YR 2/2	3
								Bm	23	L	10YR 3/2	3
								Ck	60	CL	10YR 4/2	3
CH22SBC119	W	3	M	U1h	TILL	M4	DB.SO	Ap	17	L	10YR 2/2	2
								AB	16	L	10YR 6/3	2
								Bnt	17	SCL	10YR 4/3	3
								Ck	50	CL	10YR 5/3	5
CH22SBC147	W	5	M	U1h	TILL	M4	DB.SZ	Ap	16	L	10YR 2/2	5
								Bnt	19	SCL	10YR 4/3	5
								Ck	65	CL	10YR 5/4	5
CH22SBC149	W	1	M	U1l	TILL	M4	DB.SZ	Ap	15	L	10YR 2/2	3
								Bntj	16	CL	10YR 3/2	3
								Ck	69	CL	10YR 5/3	5

Site	Drainage	Slope Percent	Slope Position	Surface Expression	Parent Material	Parent Material Code	Soil Subgroup Classification	Horizon	Thickness	Texture	Colour	Coarse Fragments (%)
CH22SBC206	W	1	U	U1l	TILL	M4	DB.SS	Ap	10	L	10YR 2/2	3
								Ae	6	L	10YR 6/2	3
								Bnt	11	CL	10YR 3/3	1
								Ck	67	CL	10YR 5/2	5
CH22SBC21	W	2	M	U1h	TILL	M4	SZ.DBC	Ap	23	L	10YR 2/2	2
								AB	12	L	10YR 4/3	2
								Bnjt	15	CL	10YR 4/3	2
								Ck	50	CL	10YR 5/3	5
CH22SBC18	W	4	M	U1h	TILL	M4	DB.SO	Ap	12	L	10YR 3/2	4
								AB	11	SL	10YR 4/2	4
								Bnt	15	SCL	10YR 4/3	4
								Ck	77	CL	10YR 5/2	4
CH22SBC198	MW	2	L	U1l	TILL	F4	GL.DBC	Ap	14	L	10YR 2/2	2
								Bmgj	20	C	10YR 2/1	1
								Ckgj1	18	C	10YR 3/2	1
								Ckgj2	48	CL	10YR 4/2	4
CH22SB092	W	2	M	U1l	TILL	M4	O.DBC	Ap	26	L	10YR 2/2	2
								Bm	22	L	10YR 5/3	2
								Ck	52	CL	10YR 5/3	5
CH22SB097	W	0	V	U1l	TILL	M4	DB.SS	Ap	17	L	10YR 3/1	2
								Ae	14	L	10YR 6/1	2
								Bnt	14	CL	10YR 3/1	2
								Ck	55	CL	10YR 4/3	2

Site	Drainage	Slope %	Slope Position	Surface Expression	Parent Material	Parent Material Texture	Soil Subgroup Classification	Horizon	Thickness (cm)	Texture	Colour	Coarse Fragments (%)
CH22DB056	W	0	V	U1l	TILL	M4	DB.SO	Ap	13	L	10YR 3/2	0
								AB	9	L	10YR 4/3	0
								Bnt	11	CL	10YR 2/2	0
								Ck	67	CL	10YR 4/3	3
CH22DB026	MW	1	L	U1h	TILL	M4	SZ.DBC	Ap	13	L	10YR 3/2	0
								Bnjt	21	CL	10YR 3/2	0
								Ck	41	CL	10YR 5/3	1
								Ckgj	25	CL	10YR 5/3	1
CH22DB196	W	2	M	U1l	TILL	M4	O.DBC	Ap	15	L	10YR 4/2	0
								Bm	24	L	10YR 4/2	2
								Ck	61	CL	10YR 5/3	8
CH22DB195	W	4	M	U1h	TILL	M4	O.DBC	Ap	20	L	10YR 4/2	0
								Bm	22	L	10YR 4/2	2
								Ck	58	CL	10YR 5/3	5
CH22DB024	W	6	M	H1l	TILL	M4	O.DBC	Ap	15	L	10YR 4/2	1
								Bm	18	L	10YR 4/3	10
								Ck	67	CL	10YR 5/3	8
CH22DB197	W	3	L	U1h	TILL	M4	O.DBC	Ap	12	L	10YR 4/2	0
								Bm	23	L	10YR 4/2	2
								Ck	65	CL	10YR 5/3	3
CH22DB020	W	15	U	M1m	TILL	M4	CA.DBC	Ap	12	L	10YR 4/2	2
								Bmk	21	L	10YR 4/3	2
								Ck	67	SIL	10YR 6/2	2
CH22DB198	W	1	M	U1l	TILL	M4	SZ.DBC	Ah	17	L	10YR 4/2	0
								Bnjt	15	SCL	10YR 4/3	1
								Ck	68	CL	10YR 5/3	1
CH22DB014	W	2	U	U1l	TILL	M4	SZ.DBC	Ap	14	L	10YR 4/2	3
								Btjnj	25	CL	10YR 3/2	3
								Ck	61	CL	10YR 5/3	3
CH22DB013	W	4	M	U1h	TILL	M4	O.DBC	Ap	13	L	10YR 3/2	2
								Bm	20	L	10YR 4/2	2
								Ck	67	CL	10YR 4/3	2
CH22DBC70	W	1	U	U1h	GLFL/TILL	L2	O.DBC	Ap	15	LS	10YR 3/2	4
								Bm	32	LS	10YR 4/4	3
								Ck	53	S	10YR 3/4	5
								Ck	29	SCL	10YR 5/2	5
CH22DB112a	I	0	D	U1l	TILL	F4	GL.HR	Apk	17	CL	10YR 2/1	4
								Cskg	83	C	10YR 5/2	2
CH22DBC77	I	1	T	U1l	TILL	M4	GL.HR	Ah	32	L	10YR 2/1	3
								Cskg	68	CL	10YR 6/1	3
CH22DB126	W	0	V	U1l	TILL	M4	O.DBC	Ap	17	L	10YR 2/2	0
								Bm	25	SL	10YR 4/2	2
								Ck	58	SCL	10YR 4/2	5
CH22DB111	W	1	V	U1l	TILL	M4	O.DBC	Ap	14	L	10YR 2/2	1
								Bm	22	SCL	10YR 4/3	3
								Ck	86	CL	10YR 5/3	3
CH22DB172	W	1	V	U1l	TILL	M4	O.DBC	Ap	16	L	10YR 3/2	53
								Bm	15	SCL	10YR 4/3	53
								Ck	69	SCL	10YR 5/3	5
CH22DB171	W	0	V	L1	TILL	M4	O.DBC	Ap	12	L	10YR 3/1	1
								Bm	28	SL	10YR 4/3	2
								Ck	60	SCL	10YR 5/2	3
CH22DB112	W	2	M	U1l	TILL	M4	O.DBC	Ap	12	L	10YR 3/2	2
								Bm	33	SCL	10YR 4/2	5
								Ck	55	SCL	10YR 4/3	5

Site	Drainage	Slope %	Slope Position	Surface Expression	Parent Material	Parent Material Texture	Soil Subgroup Classification	Horizon	Thickness (cm)	Texture	Colour	Coarse Fragments (%)
CH22DB109	W	1	U	U1l	TILL	M4	O.DBC	Ap	16	L	10YR 3/2	1
								Bm	24	SL	10YR 4/3	3
								Ck	60	SCL	10YR 5/3	6
CH22DB107	W	0	V	U1l	TILL	M4	O.DBC	Ap	17	L	10YR 2/2	2
								Bm	22	SL	10YR 3/4	3
								Ck	61	SCL	10YR 3/4	6
CH22DBC77A	W	4	M	H1l	TILL	M4	O.DBC	Ap	19	L	10YR 2/2	0
								Bm	32	SCL	10YR 3/3	0
								Ck1	14	SCL	10YR 5/3	5
								Ck2	35	LS	10YR 5/2	5
CH22DB091	W	1	V	U1l	TILL	M4	O.DBC	Ap	16	L	10YR 2/2	2
								Bm	27	L	10YR 3/2	3
								Ck	57	CL	10YR 4/2	3
CH22DB089	W	1	M	U1l	TILL	C5	O.DBC	Ap	13	L	10YR 3/2	1
								Bm	26	SL	10YR 4/2	1
								Ck	61	SL	10YR 5/3	2
CH22DBC65	I	1	T	U1h	TILL	F4	GL.DBC	Ap	11	L	10YR 3/2	0
								Bmgj	35	CL	10YR 4/2	2
								Ckg	54	C	10YR 5/3	3
CH22DB088	W	2	L	U1l	TILL	M4	CA.DBC	Apk	15	SL	10YR 2/2	3
								Bmk	34	SCL	10YR 2/2	3
								Ck	51	CL	10YR 4/3	5
CH22DB012	W	2	M	U1h	TILL	M4	SZ.DBC	Ap	14	L	10YR 2/2	2
								Bntj	28	L	10YR 4/3	2
								Ck	58	SCL	10YR 5/3	5
CH22DB210	W	2	V	U1l	TILL	M4	O.DBC	Ap	15	L	10YR 3/2	3
								Bm	25	L	10YR 4/3	3
								Ck	57	SCL	10YR 5/3	5
CH22DB209	R	1	T	U1h	TILL	M4	O.DBC	Ap	14	L	10YR 3/2	3
								Bm	24	SL	10YR 4/3	5
								Ck	62	LS	10YR 5/3	4
CH22DB208	W	0	V	U1l	TILL	M4	O.DBC	Ap	15	L	10YR 2/2	2
								Bm	25	SL	10YR 4/3	3
								Ck	85	SCL	10YR 5/3	5
CH22DBC87	W	3	U	U1h	TILL	M4	SZ.DBC	Ap	14	L	10YR 3/2	2
								Bnjtj	25	L	10YR 4/4	5
								Ck	61	SL	10YR 4/4	3
CH22DB011	W	5	U	U1h	TILL	M4	SZ.DBC	Ap	12	L	10YR 2/2	4
								AB	12	L	10YR 3/2	4
								Bntj	24	L	10YR 4/3	4
								Ck	52	CL	10YR 5/2	5
CH22DBC91	W	4	M	H1l	TILL	M4	O.DBC	Ap	24	L	10YR 3/2	2
								Bm	19	SL	10YR 4/3	2
								Ck	57	CL	10YR 5/3	2
CH22DB010	W	0	V	U1h	TILL	M4	SZ.DVC	Ap	14	L	10YR 2/2	3
								Bnjtj	23	SCL	10YR 4/4	5
								Ck	63	CL	10YR 5/4	5
CH22DB009	W	1	M	U1l	TILL	M4	DB.SO	Ap	10	L	10YR 2/2	3
								AB	17	L	10YR 4/2	2
								Bnt	18	CL	10YR 4/4	4
								Csk	55	CL	10YR 5/2	5
CH22DB006	W	4	L	U1h	TILL	M4	O.DBC	Ap	15	SCL	10YR 3/2	5
								Bm	26	SCL	10YR 4/4	5
								Ck	59	SCL	10YR 5/4	5
CH22DB005	W	1	V	U1l	TILL	C5	O.DBC	Ap	18	L	10YR 2/2	3
								Bm	19	L	10YR 3/3	2
								C	73	SL	10YR 4/4	1

Site	Drainage	Slope %	Slope Position	Surface Expression	Parent Material	Parent Material Texture	Soil Subgroup Classification	Horizon	Thickness (cm)	Texture	Colour	Coarse Fragments (%)
CH22DB004	W	0	V	U1l	TILL	M4	O.DBC	Ap	13	L	10YR 2/2	2
								Bm	27	CL	10YR 3/3	2
								Ck	60	SCL	10YR 4/3	5
CH22DB003	W	0	V	U1l	TILL	M4	SZ.DBC	Ap	14	L	10YR 3/2	5
								Bnjtj	23	SCL	10YR 3/3	5
								Ck	63	CL	10YR 4/2	5
CH22DB002	W	1	M	U1l	TILL	M4	SZ.DBC	Ap	18	L	10YR 3/2	1
								Ae	7	L	10YR 5/3	0
								Bnjt	24	SCL	10YR 5/4	0
CH22DB048	W	2	M	U1l	TILL	M4	DB.SO	Ap	14	L	10YR 3/2	3
								AB	6	L	10YR 3/2	3
								Bnt	7	CL	10YR 4/2	3
CH22DB203	W	1	L	L1	TILL	M4	SZ.DBC	Ck	73	SCL	10YR 5/4	5
								Ap	16	L	10YR 2/2	4
								AB	8	L	10YR 4/2	4
CH22DB027	W	0	V	U1l	TILL	M4	DB.SS	Bnj	17	SCL	10YR 4/3	3
								Ck	59	CL	10YR 4/4	5
								Ap	20	L	10YR 2/2	3
CH22DB023	I	0	V	L1	TILL	M4	GLSZ.DBC	Ae	5	L	10YR 6/2	3
								Bnt	18	SCL	10YR 4/2	2
								Ck	57	SCL	10YR 4/4	3
CH22DB215	W	1	V	U1l	TILL	M4	O.DBC	Ap	15	L	10YR 2/2	2
								AB	18	SIL	10YR 3/2	2
								Bnjtj	13	SCL	10YR 5/2	3
CH22DB032	W	3	M	U1h	TILL	M4	O.DBC	Ckg	54	SCL	10YR 5/4	8
								Ap	14	L	10YR 2/2	4
								Bm	20	SCL	7.5YR 4/4	4
CH22DB204	W	4	M	H1l	TILL	M4	O.DBC	Ck	66	SCL	10YR 5/3	5
								Ap	15	L	10YR 2/2	3
								Bm	21	L	10YR 4/2	3
CH22DBC135	W	5	M	H1m	TILL	M4	O.DBC	BC	49	CL	10YR 4/4	4
								Ck	15	CL	10YR 4/4	5
								Ap	16	L	10YR 2/2	3
CH22DB033	W	2	L	U1l	TILL	M4	O.DBC	Bm	21	L	10YR 4/2	3
								BC	53	SL	10YR 4/4	2
								Ck	10	SCL	10YR 4/4	8
CH22DB206	W	0	V	U1h	TILL	M4	SZ.DBC	Ah	18	L	10YR 2/2	3
								Bm	20	SL	10YR 2/2	3
								BC	27	SL	10YR 2/2	3
CH22DB045	W	1	M	U1l	TILL	M4	O.DBC	Ck	35	CL	10YR 4/3	5
								Ap	17	L	10YR 2/2	2
								Bm	28	L	10YR 4/3	2
CH22DB207	W	1	L	U1l	TILL	M4	SZ.DBC	Ck	55	CL	10YR 4/4	1
								Ap	21	L	10YR 2/2	2
								Ae	11	CL	10YR 5/1	2
CH22DB045	W	1	M	U1l	TILL	M4	O.DBC	Bnt	12	CL	10YR 4/3	2
								Ck	56	CL	10YR 6/3	1
								Ap	14	L	10YR 2/1	1
CH22DB207	W	1	L	U1l	TILL	M4	SZ.DBC	AB	16	L	10YR 3/2	1
								Bm	21	L	10YR 3/3	2
								Ck	49	CL	10YR 5/3	1
CH22DB207	W	1	L	U1l	TILL	M4	SZ.DBC	Ap	17	L	10YR 3/2	2
								Bnj	24	SL	10YR 4/3	2
								Ck	59	CL	10YR 5/3	3

Site	Drainage	Slope %	Slope Position	Surface Expression	Parent Material	Parent Material Texture	Soil Subgroup Classification	Horizon	Thickness (cm)	Texture	Colour	Coarse Fragments (%)
CH22DBC129	W	5	M	U1h	GLFL/TILL	L2	O.DBC	Ap	16	SL	10YR 2/2	8
								Bm	21	SL	10YR 2/2	5
								BC	31	SCL	10YR 4/3	2
								Ck	32	CL	10YR 4/4	5
CH22DB028	I	2	L	U1l	TILL	M4	GLE.DBC	Ap	13	L	10YR 2/2	4
								Aegj	11	L	10YR 4/2	5
								Bmgj	18	CL	10YR 4/3	5
								Ckg	58	CL	10YR 5/2	5
CH22DB218	I	0	V	U1l	TILL	M4	GLE.DBC	Ap	16	L	10YR 2/2	0
								Ae	10	SiL	10YR 6/2	1
								Bmgj	19	L	10YR 4/3	1
CH22DB211	I	1	L	U1l	TILL	F4	GLE.DBC	Ckg	55	CL	10YR 5/2	3
								Ap	16	L	10YR 2/2	1
								Aegj	10	L	10YR 6/1	1
								Btgj	12	C	10YR 4/2	0
CH22DB040	W	2	M	U1l	TILL	M4	E.DBC	Ckg	62	C	10YR 3/3	0
								Ap	14	L	10YR 2/2	3
								Ae	4	FSL	10YR 5/3	3
								Bm	21	SL	10YR 4/4	2
CH22DBC141	W	2	U	U1l	TILL	M4	O.DBC	Ck	61	CL	10YR 5/4	1
								Ap	22	L	10YR 2/2	2
								Bm	16	SL	10YR 4/2	2
								BC	49	SL	10YR 4/1	1
CH22DBC105	MW	1	L	U1l	TILL	M4	DB.SO	Ck	13	CL	10YR 5/4	5
								Ah	10	L	10YR 2/2	4
								AB	6	L	10YR 3/2	4
								Bnt	8	CL	10YR 4/2	4
CH22DB201	W	2	L	U1l	TILL	M4	SZ.DBC	Ck	76	CL	10YR 5/3	5
								Ah	13	L	10YR 2/2	3
								AB	9	L	10YR 3/2	3
								Bnj	14	SCL	10YR 4/2	3
CH22DB200	W	0	V	U1l	TILL	M4	SZ.DBC	Ck	64	CL	10YR 5/4	4
								Ah	10	L	10YR 2/2	1
								AB	9	L	10YR 3/2	1
								Bnj	20	SCL	10YR 3/2	3
CH22DB017	W	4	M	U1h	TILL	M4	DB.SZ	Ck	61	CL	10YR 4/4	3
								Ah	14	L	10YR 2/2	5
								Bnt	20	CL	10YR 4/2	5
CH22DB150	I	0	D	L2	TILL	F4	DB.SZ	Ck	66	CL	10YR 5/4	5
								Ah	15	L	10YR 3/2	1
								Bnt	20	CL	10YR 2/1	1
								Ckgj	65	C	10YR 3/2	1
CH22DB202	W	2	M	U1l	TILL	M4	SZ.DBC	Ah	10	L	10YR 2/2	1
								Bnj	21	L	10YR 4/3	2
								Ck	64	CL	10YR 4/4	4
CH22SBC53	W	1	U	U1l	TILL	M4	DB.SS	Ap	14	L	10YR 3/2	2
								Ae	5	L	10YR 5/1	3
								Bnt	20	CL	10YR 3/2	3
CH22SB087	W	1	M	U1l	TILL	M4	DB.SZ	Ck	61	CL	10YR 5/3	3
								Ap	13	L	10YR 3/2	5
								Bnt	24	CL	10YR 3/3	5
CH22SB193	I	2	L	U1l	TILL	M4	GL.DBC	Ck	63	SCL	10YR 5/2	5
								Ap	16	L	10YR 3/2	5
								Bm	13	SCL	10YR 4/2	5
								Ckg	71	SCL	10YR 4/3	5

Site	Drainage	Slope %	Slope Position	Surface Expression	Parent Material	Parent Material Texture	Soil Subgroup Classification	Horizon	Thickness (cm)	Texture	Colour	Coarse Fragments (%)
CH22SB093	I	2	T	U1l	TILL	F4	GL.DBC	Ap	19	L	10YR 2/2	0
								Bm	25	CL	10YR 2/2	0
								Ckg	56	C	10YR 2/2	0
CH22SB194	W	1	M	U1l	TILL	M4	O.DBC	Ap	18	L	10YR 3/2	5
								Bm	22	L	10YR 4/3	3
								BC	28	L	10YR 6/4	0
								Ck	32	CL	10YR 5/4	5
CH22SB157	W	1	V	U1l	TILL	M4	DB.SS	Ap	14	L	10YR 3/2	3
								Ae	3	L	10YR 4/1	3
								Bnt	21	CL	10YR 3/2	3
CH22SB094	MW	1	M	U1l	TILL	F4	O.DBC	Ap	17	L	10YR 3/2	1
								AB	24	L	10YR 4/2	1
								Bm	9	L	10YR 3/2	2
CH22SB190	I	0	D	U1l	TILL	M4	GL.DBC	Ck	50	C	10YR 3/2	1
								Ap	16	L	10YR 3/2	2
								Bm	16	L	10YR 4/3	2
CH22SB095	W	1	M	IUI	TILL	M4	O.DBC	Ckg	68	SCL	10YR 6/2	2
								Ap	16	L	10YR 3/2	3
								Bm	15	L	10YR 4/3	3
CH22SB161	P	0	D	U1h	TILL	M4	O.HG	Ck	69	L	10YR 5/3	3
								Ap	15	L	10YR 3/2	2
								Bmgj	23	L	10YR 3/2	2
CH22SB110a	P	0	D	U1l	TILL	M4	HU.LG	Ckg	62	CL	10YR 3/1	2
								Ap	19	L	10YR 3/2	0
								Aeg	10	L	10YR 6/2	1
								Btgk	28	SCL	10YR 5/2	2
CH22SB214	W	2	M	U1h	TILL	M4	DB.SZ	Ckg	43	CL	10YR 4/2	5
								Ap	11	L	10YR 3/2	3
								Bnt	31	CL	10YR 2/2	3
CH22SB096	W	1	U	U1l	TILL	M4	DB.SZ	Ck	58	CL	10YR 4/3	5
								Ap	13	L	10YR 4/2	3
								Bnt	17		10YR 3/1	3
CH22SBC169	W	2	L	U1l	TILL	M4	SZ.DBC	Ap	11	L	10YR 3/2	3
								AB	7	L	10YR 4/2	3
								Bnjtj	14	CL	10YR 3/2	4
								Ck	68	CL	10YR 4/4	8
CH22SB017	W	3	L	U1h	TILL	M4	DB.SS	Ap	17	L	10YR 3/2	2
								Ae	5	L	10YR 5/2	2
								Bnt	20	CL	10YR 4/3	2
CH22SB108	W	0	V	U1l	TILL	M4	DB.SO	Ck	58	CL	10YR 4/4	2
								Ap	19	L	10YR 3/2	2
								Ae	11	L	10YR 5/2	2
CH22DBC165	W	1	V	U1l	TILL	M4	DB.SZ	Bnt	16	CL	10YR 2/2	2
								Ck	54	CL	10YR 5/3	2
								Ap	10	L	10YR 4/2	4
CH22SB037	W	10	M	U1h	TILL	M4	O.DBC	Bnt	26	CL	10YR 3/2	5
								Ck	26	CL	10YR 5/3	6
								Ap	17	L	10YR 3/2	5
								Bm	21	SL	10YR 4/2	5
CH22SB016	W	0	V	U1l	TILL	M4	DB.SZ	BC	30	CL	10YR 4/2	5
								Ck	32	LS	10YR 4/3	3
								Ap	11	L	10YR 3/2	2
CH22SB016	W	0	V	U1l	TILL	M4	DB.SZ	Bnt	24	CL	10YR 4/3	2
								Ck	65	CL	10YR 5/3	3

Site	Drainage	Slope %	Slope Position	Surface Expression	Parent Material	Parent Material Texture	Soil Subgroup Classification	Horizon	Thickness (cm)	Texture	Colour	Coarse Fragments (%)
CH22SB180	MW	0	V	U1l	TILL	M4	GLDB.SZ	Ap	16	L	10YR 3/2	3
								Bntji	26	CL	10YR 5/3	3
								Ckgj	58	CL	10YR 5/4	3
CH22SB015	W	0	V	U1l	TILL	M4	DB.SO	Ap	12	L	10YR 4/2	5
								AB	18	SL	10YR 5/3	5
								Bnt	19	SCL	10YR 4/3	5
								Ck	51	CL	10YR 5/3	3
CH22SB041	MW	3	L	U1h	TILL	M4	DB.SZ	Ap	13	L	10YR 2/2	3
								Bnt	19	CL	10YR 3/2	3
								Ck	14	CL	10YR 3/2	3
CH22SB052	W	1	M	U1l	TILL	M4	DB.SO	Ap	13	L	10YR 2/2	3
								AB	14	L	10YR 3/2	3
								Bnt	18	CL	10YR 4/3	3
								BC	9	CL	10YR 5/3	3
								Ck	46	CL	10YR 5/3	5
CH22SB051	W	1	M	U1l	TILL	M4	O.DBC	Ap	13	L	10YR 2/2	2
								Bm	20	L	10YR 4/3	2
								BC	19	CL	10YR 4/3	2
								Ck	67	CL	10YR 4/3	2
CH22SB049	W	2	M	U1l	TILL	C5	O.DBC	Ap	14	L	10YR 2/2	8
								Bm	17	L	10YR 4/3	20
								Ck	69	SL	10YR 4/3	5
CH22SB030	MW	0	D	U1l	TILL	F4	GL.DBC	Ap	14	CL	10YR 3/1	2
								Bmgj	18	C	10YR 3/2	0
								Ckgj	68	C	10YR 3/1	0
CH22SB021	W	2	M	U1l	TILL	M4	O.DBC	Ap	17	L	10YR 2/2	4
								Bm	21	CL	10YR 3/3	4
								BC	16	CL	10YR 4/2	4
								Ck	46	CL	10YR 4/2	4
CH22SBC61	W	2	U	U1l	TILL	M4	SZ.DBC	Ap	12	L	10YR 3/2	4
								Bnj	26	CL	10YR 5/3	4
								Ck	62	CL	10YR 5/2	4
CH22SBC153	W	0	V	U1l	TILL	M4	O.DBC	Ap	15	L	10YR 2/2	2
								Bm	19	L	10YR 3/3	2
								BC	19	L	10YR 4/3	2
								Ck	47	L	10YR 4/3	2
CH22SBC1	W	0	V	U1l	TILL	M4	SZ.DBC	Ap	11	L	10YR 3/2	4
								Btj	29	CL	10YR 3/3	10
								BC	26	CL	10YR 5/3	5
								Ck	60	CL	10YR 5/3	5
CH22DB053	W	1	L	U1l	TILL	M4	DB.SS	Ap	13	L	10YR 3/2	2
								Ae	9	SL	10YR 5/2	3
								Bnt	22	SCL	10YR 4/3	3
								Ck	56	SCL	10YR 5/3	5
CH22DB046	W	2	U	U1l	TILL	M4	SZ.DBC	Ap	15	L	10YR 3/2	2
								Bnj	24	SCL	10YR 4/3	6
								Ck	61	SCL	10YR 5/3	5
CH22DB047	W	2	M	U1l	TILL	M4	O.DBC	Ap	14	SL	10YR 3/2	6
								Bm	17	SL	10YR 2/2	6
								Ck	69	SCL	10YR 5/3	6
CH22DB044	MW	0	T	L1	TILL	F4	GL.DBC	Ap	10	L	10YR 3/2	1
								Bmgj	22	C	10YR 2/2	0
								Ckgj	68	C	10YR 5/3	4
CH22DB042	W	5	C	U1h	TILL	M4	O.DBC	Ap	15	L	10YR 3/2	10
								Bm	25	SL	10YR 4/3	8
								Ck	60	CL	10YR 5/2	6

Site	Drainage	Slope %	Slope Position	Surface Expression	Parent Material	Parent Material Texture	Soil Subgroup Classification	Horizon	Thickness (cm)	Texture	Colour	Coarse Fragments (%)
CH22DB031	W	4	M	U1h	TILL	M4	DB.SZ	Ap	10	SCL	10YR 3/2	3
								Bnt	16	CL	10YR 2/2	3
								Ck	74	CL	10YR 5/3	5
CH22DB036	W	4	L	U1h	TILL	M4	O.DBC	Ap	21	L	10YR 3/2	1
								Bm	22	L	10YR 3/3	2
								BC	12	L	10YR 4/3	1
								Ck	45	CL	10YR 5/3	5
CH22DB035	I	0	V	L1	TILL	M4	O.DBC	Ap	12	L	10YR 3/2	1
								Bmgj	23	C	10YR 2/2	0
								Ckgj	65	CL	10YR 5/2	5
CH22DB038	W	0	V	L1	TILL	M4	SZ.DBC	Ap	12	L	10YR 3/2	5
								Bnj	19	CL	10YR 4/3	5
								Ck	69	CL	10YR 5/2	5
CH22DB034	W	2	T	U1l	TILL	M4	SZ.DBC	Ap	14	L	10YR 3/2	5
								Btj	25	SCL	10YR 4/3	5
								BC	6	SCL	10YR 4/4	8
CH22SB019	W	0	V	U1l	TILL	M4	SZ.DBC	Ap	12	L	10YR 3/2	3
								Bnj	28	SCL	10YR 3/3	5
								Ck	60	CL	10YR 5/3	3
CH22SB022	MW	2	L	U1l	TILL	M4	GL.DBC	Ap	15	L	10YR 2/2	2
								Aegj	16	L	10YR 5/2	2
								Btgj	19	CL	10YR 4/3	2
								Ckg	69	CL	10YR 5/3	5
CH22SBC99	W	2	M	U1l	TILL	M4	DB.SZ	Ap	13	L	10YR 2/2	5
								Bntj	21	CL	10YR 4/3	5
								Ck	66	CL	10YR 5/3	5
CH22SBC98	W	1	U	U1l	TILL	M4	O.DBC	Ap	18	L	10YR 2/2	3
								Bm	20	L	10YR 4/3	3
								Ck	62	CL	10YR 4/3	5
CH22SB050	MW	2	D	U1l	GLLC	F1	GLSZ.DBC	Ap	10	L	10YR 2/2	0
								AB	8	L	10YR 2/2	0
								Bnjgj	24	C	10YR 2/2	0
								Ckgj	58	C	10YR 2/2	0
CH22SB179	W	0	V	U1l	TILL	M4	SZ.DBC	Ap	12	L	10YR 3/2	5
								Bntj	23	SCL	10YR 4/2	5
								Ck	65	CL	10YR 4/3	5
CH22SBC10	W	1	L	U1l	TILL	M4	DB.SO	Ap	10	L	10YR 3/2	3
								AB	9	L	10YR 3/2	3
								Ck	61	CL	10YR 5/3	3
CH22DB076	MW	1	M	U1l	TILL	M4	DB.SS	Ap	13	SiL	10YR 3/2	2
								Ar	7	L	10YR 4/1	3
								Bnt	11	CL	10YR 3/2	3
								Ck	69	CL	10YR 4/2	3
CH22DB082	W	0	V	U1l	TILL	M4	DB.SO	Ap	13	L	10YR 2/2	2
								AB	8	L	10YR 4/3	2
								Bnt	13	CL	10YR 4/3	2
								Ck	61	CL	10YR 5/3	5
CH22DB075	W	3	M	U1h	TILL	M4	SZ.DBC	Ap	10	L	10YR 2/2	5
								Bnj	23	CL	10YR 4/2	5
								Ck	67	CL	10YR 4/2	5
CH22DB073	W	2	U	U1l	TILL	M4	O.DBC	Ap	14	L	10YR 2/2	5
								Bm	23	SCL	10YR 4/3	5
								Ck	63	CL	10YR 5/3	5

Site	Drainage	Slope %	Slope Position	Surface Expression	Parent Material	Parent Material Texture	Soil Subgroup Classification	Horizon	Thickness (cm)	Texture	Colour	Coarse Fragments (%)
CH22DB113	W	1	V	U1l	TILL	M4	SZ.DBC	Ap	13	L	10YR 3/2	2
								AB	10	L	10YR 4/3	2
								Bnjtj	17	CL	10YR 3/2	2
								Ck	60	CL	10YR 5/3	2
CH22DBC181	I	0	V	U1l	TILL	MW	GLSZ.DBC	Ap	14	L	10YR 3/2	2
								Bnjtgj	20	C	10YR 3/3	2
								Ckgj	66	CL	10YR 5/3	4
CH22DB072	W	1	M	U1l	TILL	M4	SZ.DBC	Ap	15	L	10YR 2/2	5
								AB	5	L	10YR 4/2	5
								Bnjtj	19	L	10YR 3/2	5
								Ck	61	CL	10YR 4/3	5
CH22DB177	W	1	M	U1l	TILL	M4	SZ.DBC	Ap	14	L	10YR 2/2	3
								Bnj	25	SCL	10YR 4/3	3
								Ck	61	CL	10YR 5/2	3
CH22DB174	W	0	V	U1l	TILL	M4	DB.SZ	Ap	14	L	10YR 2/2	3
								Bnt	20	CL	10YR 3/2	4
								Ck	66	SCL	10YR 4/3	4
CH22DB081	W	2	M	U1l	TILL	M4	O.DBC	Ap	15	L	10YR 2/2	4
								Bm	21	L	10YR 4/2	4
								Ck	64	CL	10YR 5/2	5
CH22DB173	W	2	M	U1l	TILL	M4	DB.SO	Ap	13	L	10YR 3/1	3
								AB	10	L	10YR 5/2	3
								Bnt	13	CL	10YR 4/2	3
								Ck	64	C	10YR 4/3	1
CH22DBC210	W	0	V	L1	TILL	M4	O.DBC	Ap	10	L	10YR 3/1	5
								Bm	28	CL	10YR 4/3	5
								Ck	62	CL	10YR 4/4	5
CH22DB064	W	0	V	U1l	TILL	M4	DB.SS	Ap	12	L	10YR 3/2	3
								Ae	10	L	10YR 5/1	3
								Bnt	6	CL	10YR 4/3	3
								Ck	72	CL	10YR 5/4	3
CH22DB066	W	0	V	U1h	TILL	M4	O.DBC	Ap	20	L	10YR 3/2	1
								AB	10	L	10YR 4/2	1
								Bm	29	L	10YR 4/2	1
								BC	18	L	10YR 4/2	1
								Ck	40	CL	10YR 4/3	5
CH22DB185	W	1	C	U1l	TILL	M4	SZ.DBC	Ap	7	L	10YR 3/2	4
								Bnjtj	19	C	10YR 3/2	4
CH22SB039	W	3	M	U1h	TILL	M4	O.DBC	Ap	14	L	10YR 3/2	5
								Bm	19	L	10YR 4/3	5
								BC	17	CL	10YR 4/3	3
								Ck	50	CL	10YR 5/3	3
CH22SB178	W	1	V	U1l	TILL	M4	O.DBC	Ap	22	L	10YR 3/2	2
								Bm	14	L	10YR 4/3	2
								BC	64	SCL	10YR 4/3	2
								Ck	30	SC	10YR 5/2	5
CH22SB059	W	1	M	U1l	TILL	M4	O.DBC	Ap	19	L	10YR 2/2	2
								Bm	12	L	10YR 3/3	2
								Ck	69	L	10YR 5/3	1
CH22SB063	W	4	U	U1h	TILL	M4	SZ.DBC	Ap	12	L	10YR 2/2	5
								AB	7	L	10YR 2/2	5
								Bnk	17	SCL	10YR 5/3	5
								Ck	64	CL	10YR 5/3	5
CH22SBC188	W	3	M	U1h	TILL	M4	SZ.DBC	Ap	14	L	10YR 2/2	3
								Bnj	17	CL	10YR 4/2	3
								BC	14	CL	10YR 4/3	3
								Ck	55	CL	10YR 4/3	3

Site	Drainage	Slope %	Slope Position	Surface Expression	Parent Material	Parent Material Texture	Soil Subgroup Classification	Horizon	Thickness (cm)	Texture	Colour	Coarse Fragments (%)
CH22SB058	W	0	V	U1l	TILL	M4	O.DBC	Ap	17	L	10YR 2/2	2
								Bm	12	CL	10YR 4/2	3
								Ck	71	CL	10YR 4/3	3
CH22SB060	MW	2	L	U1l	TILL	M4	GL.DBC	Ap	16	L	10YR 2/2	5
								Bm	17	L	10YR 4/3	5
								Ck	17	CL	10YR 3/3	5
								Ckgj	50	CL	10YR 4/3	5
CH22SB055	W	2	M	U1l	TILL	M4	DB.SS	Ap	17	L	10YR 3/2	3
								Ae	9	L	10YR 6/3	3
								Bnt	17	CL	10YR 3/1	1
CH22SB186	W	1	M	U1l	TILL	M4	SZ.DBC	Ap	15	L	10YR 3/2	3
								Bnj	20	L	10YR 5/3	3
								Ck	65	CL	10YR 5/3	6
CH22SB061	W	1	L	U1l	TILL	M4	DB.SZ	Ap	15	L	10YR 3/2	5
								Bnt	24	CL	10YR 4/2	2
								Ck	65	CL	10YR 5/3	5
CH22SB205	W	4	M	H1l	TILL	M4	SZ.DBC	Ap	13	L	10YR 3/1	5
								Bnj	23	CL	10YR 4/2	5
								Ck	64	CL	10YR 5/2	5
CH22SB069	W	4	C	H1l	TILL	M4	O.DBC	Ap	12	L	10YR 3/2	8
								Bm	14	LS	7.5YR 4/3	15
								BC	13	CL	10YR 5/3	5
								Ck	61	LS	10YR 6/1	5
CH22SB067	P	2	D	H1l	TILL	M4	HU.LG	Ap	13	L	10YR 3/2	2
								Aegj	15	L	10YR 6/2	2
								Btg	17	CL	10YR 5/2	1
								Ckg	55	CL	10YR 5/3	4
CH22SB102	W	3	M	U1h	TILL	M4	O.DBC	Ap	24	L	10YR 2/2	4
								Bm	18	L	10YR 4/3	5
								Ck	58	CL	10YR 5/3	6
CH22SB101	W	2	U	U1l	TILL	M4	DB.SO	Ap	24	L	10YR 2/2	3
								AB	13	L	10YR 4/3	1
								Bnt	22	CL	10YR 3/2	2
								Ck	54	CL	10YR 5/3	5
CH22SB103	W	1	M	U1l	TILL	M4	O.DBC	Ap	14	L	10YR 3/1	3
								Bm	29	L	10YR 3/2	3
								Ck	57	L	10YR 3/3	3
CH22SB212	W	2	L	U1l	TILL	M4	SZ.DBC	Ap	17	L	10YR 3/2	5
								Bnj	19	CL	10YR 3/1	5
								Ck	64	CL	10YR 5/3	5
CH22SB104	W	1	M	U1l	TILL	M4	DB.SZ	Ap	16	L	10YR 2/2	3
								Bnt	18	CL	10YR 3/2	3
								Ck	66	CL	10YR 5/3	5
CH22SBC80	I	1	T	U1l	TILL	M4	GLSZ.DBC	Ap	14	L	10YR 2/2	4
								Bnjtgj	29	SCL	10YR 4/3	2
								Ckgj	57	CL	10YR 5/3	5
CH22SBC223	W	1	M	U1l	TILL	M4	DB.SS	Ah	12	L	10YR 2/2	2
								Ae	10	L	10YR 5/2	2
								Bnt	21	CL	10YR 5/2	2
								Ck	57	CL	10YR 6/3	6
CH22SBC83	W	0	V	U1l	TILL	M4	SZ.DBC	Ap	14	L	10YR 3/2	2
								Ae	12	L	10YR 5/2	2
								Bnjt	21	SCL	10YR 4/2	2
								Ck	53	CL	10YR 4/3	5

Site	Drainage	Slope %	Slope Position	Surface Expression	Parent Material	Parent Material Texture	Soil Subgroup Classification	Horizon	Thickness (cm)	Texture	Colour	Coarse Fragments (%)
CH22SB084	W	5	M	U1h	TILL	M4	SZ.DBC	Ap	18	L	10YR 3/2	2
								AB	17	L	10YR 3/2	2
								Bnj	20	L	10YR 5/3	2
CH22SB189	W	2	U	U1l	TILL	M4	O.DBC	Ap	18	L	10YR 2/2	2
								Bm	24	L	10YR 4/3	2
								Ck	58	CL	10YR 5/3	2
CH22SBC33	W	0	V	L1	TILL	M4	SZ.DBC	Ap	19	L	10YR 2/2	2
								Bnj	12	CL	10YR 4/2	2
								Ck	69	CL	10YR 4/3	2
CH22SB085	W	1	M	U1l	TILL	M4	DB.SO	Ap	15	L	10YR 2/2	2
								AB	14	L	10YR 5/2	2
								Bnt	12	CL	10YR 2/2	2
								Ck	58	CL	10YR 5/3	2
CH22SB188	W	1	V	U1l	TILL	M4	DB.SS	Ap	13	L	10YR 2/2	3
								Ae	4	L	10YR 6/2	3
								Bnt	24	CL	10YR 4/2	3
								Ck	59	CL	10YR 4/3	3
CH22SB083	MW	0	V	U1l	TILL	M4	GL.DBC	Ap	16	L	10YR 3/1	1
								Bm	22	L	10YR 3/1	1
								Ckgj	62	SCL	10YR 4/3	3
CH22SB079	W	4	M	IUI	TILL	M4	SZ.DBC	Ap	14	L	10YR 3/2	2
								AB	10	L	10YR 4/2	2
								Bnjt	18	CL	10YR 4/3	4
								Ck	68	CL	10YR 5/3	8
CH22SB187	W	1	M	U1l	TILL	M4	DB.SZ	Ap	11	SL	10YR 3/2	8
								Bnt	19	CL	10YR 4/3	5
								Ck	70	SCL	10YR 5/3	5
CH22SB070	I	0	T	U1l	TILL	M4	GL.DBC	Ap	10	L	10YR 2/2	3
								Bnjtj	10	CL	10YR 3/1	3
								Ckgj	80	CL	10YR 4/3	4
CH22SB183	I	1	T	U1h	TILL	F4	DB.SS	Ap	15	L	10YR 3/2	2
								Ae	8	L	10YR 5/1	2
								Bntgj	16	CL	10YR 3/3	2
								Ckgj	77	C	10YR 3/1	4
CH22SB068	W	1	M	U1l	TILL	M4	DB.SZ	Ap	15	L	10YR 3/2	5
								Bnt	25	CL	10YR 3/2	5
								Ck	60	CL	10YR 4/3	5
CH22SBC36	W	0	V	U1l	TILL	M4	DB.SS	Ap	23	L	10YR 3/2	2
								Ae	6	L	10YR 5/2	3
								Bnt	12	CL	10YR 4/3	2
								Ck	59	CL	10YR 5/3	5
CH22SBC39	W	2	M	U1l	TILL	M4	O.DBC	Ap	11	L	10YR 3/1	4
								Bm	15	L	10YR 4/3	4
								BC	34	CL	10YR 4/2	2
								Ck	40	CL	10YR 4/2	4
CH22SB054	W	1	U	U1l	TILL	M4	DB.SO	Ap	13	L	10YR 3/2	3
								AB	13	L	10YR 4/3	3
								Bnt	16	SCL	10YR 3/2	3
								Ck	58	CL	10YR 5/3	3
CH22SB213	W	0	V	L1	TILL	M4	SZ.DBC	Ap	12	L	10YR 3/2	2
								Bnj	26	CL	10YR 3/2	2
								Ck	62	CL	10YR 4/2	2
CH22SB074	MW	0	V	U1l	TILL	F4	SZ.DBC	Ap	15	L	10YR 3/2	2
								Bnjt	19	C	10YR 3/3	2
								Ck	66	C	10YR 3/3	1
CH22SB176	W	1	M	U1l	TILL	M4	SZ.DBC	Ap	13	L	10YR 3/2	2
								Bnj	17	CL	10YR 3/2	2
								Ck	70	CL	10YR 5/3	2

Site	Drainage	Slope %	Slope Position	Surface Expression	Parent Material	Parent Material Texture	Soil Subgroup Classification	Horizon	Thickness (cm)	Texture	Colour	Coarse Fragments (%)
CH22SB078	W	1	M	U1l	TILL	M4	SZ.DBC	Ap	14	L	10YR 2/2	2
								Ae	5	L	10YR 5/1	2
								Bnjt	15	C	10YR 3/2	2
								Ck	66	CL	10YR 4/3	2
CH22SBC4	W	1	M	U1l	TILL	M4	O.DBC	Ap	14	L	10YR 2/2	2
								Btj	23	SCL	10YR 3/2	2
								Ck	63	CL	10YR 4/3	2
CH22SB099	W	1	M	U1l	TILL	M4	DB.SS	Ap	13	L	10YR 3/2	2
								Bnt	17	CL	10YR 4/2	2
								Ck	70	CL	10YR 5/3	4
CH22SB098	W	1	L	U1l	TILL	M4	O.DBC	Ap	17	L	10YR 2/2	3
								Bm	23	L	10YR 3/2	3
								Ck	60	CL	10YR 4/2	3
CH22SBC119	W	3	M	U1h	TILL	M4	DB.SO	Ap	17	L	10YR 2/2	2
								AB	16	L	10YR 6/3	2
								Bnt	17	SCL	10YR 4/3	3
								Ck	50	CL	10YR 5/3	5
CH22SBC147	W	5	M	U1h	TILL	M4	DB.SZ	Ap	16	L	10YR 2/2	5
								Bnt	19	SCL	10YR 4/3	5
								Ck	65	CL	10YR 5/4	5
CH22SBC149	W	1	M	U1l	TILL	M4	DB.SZ	Ap	15	L	10YR 2/2	3
								Bntj	16	CL	10YR 3/2	3
								Ck	69	CL	10YR 5/3	5
CH22SBC206	W	1	U	U1l	TILL	M4	DB.SS	Ap	10	L	10YR 2/2	3
								Ae	6	L	10YR 6/2	3
								Bnt	11	CL	10YR 3/3	1
								Ck	67	CL	10YR 5/2	5
CH22SBC21	W	2	M	U1h	TILL	M4	SZ.DBC	Ap	23	L	10YR 2/2	2
								AB	12	L	10YR 4/3	2
								Bnjt	15	CL	10YR 4/3	2
								Ck	50	CL	10YR 5/3	5
CH22SBC18	W	4	M	U1h	TILL	M4	DB.SO	Ap	12	L	10YR 3/2	4
								AB	11	SL	10YR 4/2	4
								Bnt	15	SCL	10YR 4/3	4
								Ck	77	CL	10YR 5/2	4
CH22SBC198	MW	2	L	U1l	TILL	F4	GL.DBC	Ap	14	L	10YR 2/2	2
								Bmgj	20	C	10YR 2/1	1
								Ckgj1	18	C	10YR 3/2	1
								Ckgj2	48	CL	10YR 4/2	4
CH22SB092	W	2	M	U1l	TILL	M4	O.DBC	Ap	26	L	10YR 2/2	2
								Bm	22	L	10YR 5/3	2
								Ck	52	CL	10YR 5/3	5
CH22SB097	W	0	V	U1l	TILL	M4	DB.SS	Ap	17	L	10YR 3/1	2
								Ae	14	L	10YR 6/1	2
								Bnt	14	CL	10YR 3/1	2
								Ck	55	CL	10YR 4/3	2

APPENDIX F

Soil Laboratory Analysis Data



Your Project #: 21452763
 Site Location: CAPITAL POWER HALKIRK 2
 Your C.O.C. #: 1 of 1, 2 of 2

Attention: Claire Kisko
 GOLDER ASSOCIATES LTD
 16820-107 AVE
 EDMONTON, AB
 CANADA T5P 4C3

Report Date: 2022/10/01
 Report #: R3241983
 Version: 1 - Partial

CERTIFICATE OF ANALYSIS – PARTIAL RESULTS

BUREAU VERITAS JOB #: C272486

Received: 2022/09/20, 15:15

Sample Matrix: Soil
 # Samples Received: 12

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Cation/EC Ratio	12	N/A	2022/09/28		Auto Calc
Chloride (Soluble)	7	2022/09/27	2022/09/27	AB SOP-00033 / AB SOP-00020	SM 23-4500-Cl-E m
Chloride (Soluble)	5	2022/09/27	2022/09/28	AB SOP-00033 / AB SOP-00020	SM 23-4500-Cl-E m
Conductivity @25C (Soluble)	7	2022/09/27	2022/09/27	AB SOP-00033 / AB SOP-00004	SM 23 2510 B m
Conductivity @25C (Soluble)	1	2022/09/27	2022/09/28	AB SOP-00033 / AB SOP-00004	SM 23 2510 B m
Conductivity @25C (Soluble)	4	2022/09/28	2022/09/28	AB SOP-00033 / AB SOP-00004	SM 23 2510 B m
Sum of Cations, Anions	12	N/A	2022/09/28		Auto Calc
pH @25C (1:2 Calcium Chloride Extract)	11	2022/09/27	2022/09/27	AB SOP-00033 / AB SOP-00006	SM 23 4500 H+B m
pH @25C (1:2 Calcium Chloride Extract)	1	2022/09/28	2022/09/28	AB SOP-00033 / AB SOP-00006	SM 23 4500 H+B m
Sodium Adsorption Ratio	12	N/A	2022/09/28		Auto Calc
Soluble Ions	7	2022/09/27	2022/09/27	AB SOP-00033 / AB SOP-00042	EPA 6010d R5 m
Soluble Ions	5	2022/09/27	2022/09/28	AB SOP-00033 / AB SOP-00042	EPA 6010d R5 m
Soluble Paste	12	2022/09/27	2022/09/27	AB SOP-00033	Carter 2nd ed 15.2 m
Soluble Ions Calculation	12	N/A	2022/09/27		Auto Calc
Texture by Hydrometer	12	N/A	2022/10/01	AB SOP-00030	Carter 2nd ed 55.3 m
Texture Class	12	N/A	2022/10/01		Auto Calc
Theoretical Gypsum Requirement (1)	12	N/A	2022/09/28		Auto Calc

Remarks:

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, MELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are

Bureau Veritas - Partial/Rush Results



Bureau Veritas - Partial/Rush Results

Your Project #: 21452763
Site Location: CAPITAL POWER HALKIRK 2
Your C.O.C. #: 1 of 1, 2 of 2

Attention: Claire Kisko
GOLDER ASSOCIATES LTD
16820-107 AVE
EDMONTON, AB
CANADA T5P 4C3

Report Date: 2022/10/01
Report #: R3241983
Version: 1 - Partial

CERTIFICATE OF ANALYSIS – PARTIAL RESULTS

BUREAU VERITAS JOB #: C272486

Received: 2022/09/20, 15:15

reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.

Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested. This Certificate shall not be reproduced except in full, without the written approval of the laboratory.

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

(1) TGR calculation is based on a theoretical SAR of 4. Salt Contamination and Assessment and remediation guideline 2001 recommended SAR is ranging 4-8. TGR is reported in tonnes/ha.

Encryption Key



**AUTHORIZED REPORT
RAPPORT AUTORISÉ**

Bureau Veritas

01 Oct 2022 16:27:35

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

Cynny Hagen, Key Account Specialist
Email: Cynny.HAGEN@bureauveritas.com
Phone# (403)735-2273

=====

This report has been generated and distributed using a secure automated process. Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation please refer to the Validation Signature Page.



BUREAU
VERITAS

Bureau Veritas Job #: C272486
Report Date: 2022/10/01

GOLDER ASSOCIATES LTD
Client Project #: 21452763
Site Location: CAPITAL POWER HALKIRK 2
Sampler Initials: DB

RESULTS OF CHEMICAL ANALYSES OF SOIL

Bureau Veritas ID		BCH625			BCH626		
Sampling Date		2022/08/25			2022/08/25		
COC Number		1 of 1			1 of 1		
	UNITS	CH22DB198-AH(0-17)	RDL	QC Batch	CH22DB198-BNJT(17-32)	RDL	QC Batch
Calculated Parameters							
Anion Sum	meq/L	1.4	N/A	A725442	25	N/A	A725442
Cation Sum	meq/L	3.2	N/A	A725442	27	N/A	A725442
Cation/EC Ratio	N/A	8.9	0.10	A725441	9.5	0.10	A725441
Calculated Calcium (Ca)	mg/kg	1.0	0.66	A725443	11	0.69	A725443
Calculated Magnesium (Mg)	mg/kg	0.93	0.44	A725443	7.8	0.46	A725443
Calculated Sodium (Na)	mg/kg	28	1.1	A725443	260	1.1	A725443
Calculated Potassium (K)	mg/kg	1.6	0.57	A725443	1.4	0.60	A725443
Calculated Chloride (Cl)	mg/kg	<4.4	4.4	A725443	<4.6	4.6	A725443
Calculated Sulphate (SO4)	mg/kg	29	2.2	A725443	560	2.3	A725443
Soluble Parameters							
Soluble Chloride (Cl)	mg/L	<10	10	A732521	<10	10	A734293
Soluble Conductivity	dS/m	0.36	0.020	A732604	2.9	0.020	A734160
Soluble (CaCl2) pH	pH	4.66	N/A	A731590	6.78	N/A	A731688
Sodium Adsorption Ratio	N/A	7.3	0.10	A725412	22	0.10	A725412
Soluble Calcium (Ca)	mg/L	2.3	1.5	A732555	24	1.5	A733677
Soluble Magnesium (Mg)	mg/L	2.1	1.0	A732555	17	1.0	A733677
Soluble Sodium (Na)	mg/L	64	2.5	A732555	570	2.5	A733677
Soluble Potassium (K)	mg/L	3.8	1.3	A732555	3.1	1.3	A733677
Saturation %	%	44	N/A	A731587	46	N/A	A731680
Soluble Sulphate (SO4)	mg/L	66	5.0	A732555	1200	5.0	A733677
Theoretical Gypsum Requirement	tonnes/ha	<0.20	0.20	A725444	5.6	0.20	A725444
RDL = Reportable Detection Limit N/A = Not Applicable							

Bureau Veritas - Partial/Rush Results



BUREAU
VERITAS

Bureau Veritas Job #: C272486
Report Date: 2022/10/01

GOLDER ASSOCIATES LTD
Client Project #: 21452763
Site Location: CAPITAL POWER HALKIRK 2
Sampler Initials: DB

RESULTS OF CHEMICAL ANALYSES OF SOIL

Bureau Veritas ID		BCH627			BCH628		
Sampling Date		2022/08/25			2022/08/27		
COC Number		1 of 1			1 of 1		
	UNITS	CH22DB198-CK(32-100)	RDL	QC Batch	CH22DB009-AP(0-10)	RDL	QC Batch
Calculated Parameters							
Anion Sum	meq/L	170	N/A	A725442	0.45	N/A	A725442
Cation Sum	meq/L	170	N/A	A725442	6.9	N/A	A725442
Cation/EC Ratio	N/A	12	0.10	A725441	8.8	0.10	A725441
Calculated Calcium (Ca)	mg/kg	210	0.79	A725443	46	0.90	A725443
Calculated Magnesium (Mg)	mg/kg	170	0.53	A725443	11	0.60	A725443
Calculated Sodium (Na)	mg/kg	1500	1.3	A725443	14	1.5	A725443
Calculated Potassium (K)	mg/kg	5.0	0.68	A725443	14	0.78	A725443
Calculated Chloride (Cl)	mg/kg	<5.3	5.3	A725443	<6.0	6.0	A725443
Calculated Sulphate (SO4)	mg/kg	4300	2.6	A725443	13	3.0	A725443
Soluble Parameters							
Soluble Chloride (Cl)	mg/L	<10	10	A732521	<10	10	A733776
Soluble Conductivity	dS/m	13	0.020	A732604	0.79	0.020	A733836
Soluble (CaCl2) pH	pH	8.28	N/A	A731590	6.17	N/A	A732076
Sodium Adsorption Ratio	N/A	25	0.10	A725412	0.62	0.10	A725412
Soluble Calcium (Ca)	mg/L	390	1.5	A732555	76	1.5	A732999
Soluble Magnesium (Mg)	mg/L	320	1.0	A732555	19	1.0	A732999
Soluble Sodium (Na)	mg/L	2800	2.5	A732555	23	2.5	A732999
Soluble Potassium (K)	mg/L	9.4	1.3	A732555	23	1.3	A732999
Saturation %	%	53	N/A	A731587	60	N/A	A732071
Soluble Sulphate (SO4)	mg/L	8100	5.0	A732555	22	5.0	A732999
Theoretical Gypsum Requirement	tonnes/ha	160	0.20	A725444	<0.20	0.20	A725444
RDL = Reportable Detection Limit N/A = Not Applicable							

Bureau Veritas - Partial/Rush Results



BUREAU
VERITAS

Bureau Veritas Job #: C272486
Report Date: 2022/10/01

GOLDER ASSOCIATES LTD
Client Project #: 21452763
Site Location: CAPITAL POWER HALKIRK 2
Sampler Initials: DB

RESULTS OF CHEMICAL ANALYSES OF SOIL

Bureau Veritas ID		BCH629			BCH630		
Sampling Date		2022/08/27			2022/08/27		
COC Number		1 of 1			1 of 1		
	UNITS	CH22DB009-AB(10-27)	RDL	QC Batch	CH22DB009-BNT(27-45)	RDL	QC Batch
Calculated Parameters							
Anion Sum	meq/L	0.49	N/A	A725442	0.79	N/A	A725442
Cation Sum	meq/L	1.8	N/A	A725442	2.8	N/A	A725442
Cation/EC Ratio	N/A	11	0.10	A725441	12	0.10	A725441
Calculated Calcium (Ca)	mg/kg	5.2	0.74	A725443	8.1	0.60	A725443
Calculated Magnesium (Mg)	mg/kg	1.7	0.49	A725443	2.8	0.40	A725443
Calculated Sodium (Na)	mg/kg	11	1.2	A725443	10	1.0	A725443
Calculated Potassium (K)	mg/kg	<0.64	0.64	A725443	0.95	0.52	A725443
Calculated Chloride (Cl)	mg/kg	<4.9	4.9	A725443	<4.0	4.0	A725443
Calculated Sulphate (SO4)	mg/kg	12	2.5	A725443	15	2.0	A725443
Soluble Parameters							
Soluble Chloride (Cl)	mg/L	<10	10	A732521	<10	10	A734293
Soluble Conductivity	dS/m	0.16	0.020	A732604	0.22	0.020	A734160
Soluble (CaCl2) pH	pH	6.35	N/A	A731590	6.75	N/A	A731688
Sodium Adsorption Ratio	N/A	1.6	0.10	A725412	1.3	0.10	A725412
Soluble Calcium (Ca)	mg/L	11	1.5	A732555	20	1.5	A733677
Soluble Magnesium (Mg)	mg/L	3.5	1.0	A732555	6.9	1.0	A733677
Soluble Sodium (Na)	mg/L	23	2.5	A732555	26	2.5	A733677
Soluble Potassium (K)	mg/L	<1.3	1.3	A732555	2.4	1.3	A733677
Saturation %	%	49	N/A	A731587	40	N/A	A731680
Soluble Sulphate (SO4)	mg/L	24	5.0	A732555	38	5.0	A733677
Theoretical Gypsum Requirement	tonnes/ha	<0.20	0.20	A725444	<0.20	0.20	A725444
RDL = Reportable Detection Limit N/A = Not Applicable							

Bureau Veritas - Partial/Rush Results



BUREAU
VERITAS

Bureau Veritas Job #: C272486
Report Date: 2022/10/01

GOLDER ASSOCIATES LTD
Client Project #: 21452763
Site Location: CAPITAL POWER HALKIRK 2
Sampler Initials: DB

RESULTS OF CHEMICAL ANALYSES OF SOIL

Bureau Veritas ID		BCH631		BCH632		BCH633		
Sampling Date		2022/08/27		2022/08/28		2022/08/28		
COC Number		1 of 1		1 of 1		1 of 1		
	UNITS	CH22DB009-CK(45-100)	RDL	CH22DB048-AP(0-45)	RDL	CH22DB048-AB(14-20)	RDL	QC Batch
Calculated Parameters								
Anion Sum	meq/L	45	N/A	0.76	N/A	0.64	N/A	A725442
Cation Sum	meq/L	48	N/A	4.2	N/A	2.5	N/A	A725442
Cation/EC Ratio	N/A	14	0.10	8.3	0.10	8.3	0.10	A725441
Calculated Calcium (Ca)	mg/kg	190	0.58	12	0.65	2.4	0.52	A725443
Calculated Magnesium (Mg)	mg/kg	94	0.39	4.3	0.43	1.4	0.35	A725443
Calculated Sodium (Na)	mg/kg	28	0.97	14	1.1	14	0.87	A725443
Calculated Potassium (K)	mg/kg	3.3	0.51	8.6	0.56	1.0	0.45	A725443
Calculated Chloride (Cl)	mg/kg	<3.9	3.9	<4.3	4.3	<3.5	3.5	A725443
Calculated Sulphate (SO4)	mg/kg	840	1.9	16	2.2	11	1.7	A725443
Soluble Parameters								
Soluble Chloride (Cl)	mg/L	<10	10	<10	10	<10	10	A732521
Soluble Conductivity	dS/m	3.4	0.020	0.50	0.020	0.30	0.020	A732604
Soluble (CaCl2) pH	pH	7.87	N/A	4.77	N/A	4.84	N/A	A731590
Sodium Adsorption Ratio	N/A	0.65	0.10	1.3	0.10	2.9	0.10	A725412
Soluble Calcium (Ca)	mg/L	490	1.5	28	1.5	6.9	1.5	A732555
Soluble Magnesium (Mg)	mg/L	240	1.0	10	1.0	4.0	1.0	A732555
Soluble Sodium (Na)	mg/L	71	2.5	32	2.5	39	2.5	A732555
Soluble Potassium (K)	mg/L	8.5	1.3	20	1.3	2.9	1.3	A732555
Saturation %	%	39	N/A	43	N/A	35	N/A	A731587
Soluble Sulphate (SO4)	mg/L	2200	5.0	37	5.0	31	5.0	A732555
Theoretical Gypsum Requirement	tonnes/ha	<0.20	0.20	<0.20	0.20	<0.20	0.20	A725444
RDL = Reportable Detection Limit N/A = Not Applicable								

Bureau Veritas - Partial/Rush Results



BUREAU
VERITAS

Bureau Veritas Job #: C272486
Report Date: 2022/10/01

GOLDER ASSOCIATES LTD
Client Project #: 21452763
Site Location: CAPITAL POWER HALKIRK 2
Sampler Initials: DB

RESULTS OF CHEMICAL ANALYSES OF SOIL

Bureau Veritas ID		BCH634			BCH640		
Sampling Date		2022/08/28			2022/08/28		
COC Number		1 of 1			2 of 2		
	UNITS	CH22DB048-BNT(20-27)	RDL	QC Batch	CH22DB048-CK(27-100)	RDL	QC Batch
Calculated Parameters							
Anion Sum	meq/L	1.1	N/A	A725442	48	N/A	A725442
Cation Sum	meq/L	2.8	N/A	A725442	51	N/A	A725442
Cation/EC Ratio	N/A	11	0.10	A725441	13	0.10	A725441
Calculated Calcium (Ca)	mg/kg	2.4	0.49	A725443	190	0.62	A725443
Calculated Magnesium (Mg)	mg/kg	1.2	0.33	A725443	86	0.41	A725443
Calculated Sodium (Na)	mg/kg	16	0.82	A725443	97	1.0	A725443
Calculated Potassium (K)	mg/kg	0.57	0.43	A725443	4.9	0.54	A725443
Calculated Chloride (Cl)	mg/kg	<3.3	3.3	A725443	<4.1	4.1	A725443
Calculated Sulphate (SO4)	mg/kg	17	1.6	A725443	960	2.1	A725443
Soluble Parameters							
Soluble Chloride (Cl)	mg/L	<10	10	A734293	<10	10	A732521
Soluble Conductivity	dS/m	0.25	0.020	A734160	3.9	0.020	A732604
Soluble (CaCl2) pH	pH	6.88	N/A	A731688	7.96	N/A	A731590
Sodium Adsorption Ratio	N/A	3.6	0.10	A725412	2.3	0.10	A725412
Soluble Calcium (Ca)	mg/L	7.4	1.5	A733677	470	1.5	A732555
Soluble Magnesium (Mg)	mg/L	3.6	1.0	A733677	210	1.0	A732555
Soluble Sodium (Na)	mg/L	48	2.5	A733677	240	2.5	A732555
Soluble Potassium (K)	mg/L	1.7	1.3	A733677	12	1.3	A732555
Saturation %	%	33	N/A	A731680	41	N/A	A731587
Soluble Sulphate (SO4)	mg/L	51	5.0	A733677	2300	5.0	A732555
Theoretical Gypsum Requirement	tonnes/ha	<0.20	0.20	A725444	<0.20	0.20	A725444
RDL = Reportable Detection Limit N/A = Not Applicable							

Bureau Veritas - Partial/Rush Results



RESULTS OF CHEMICAL ANALYSES OF SOIL

Bureau Veritas ID		BCH641		
Sampling Date		2022/08/29		
COC Number		2 of 2		
	UNITS	CH22DBC105-BNT(16-24)	RDL	QC Batch
Calculated Parameters				
Anion Sum	meq/L	1.7	N/A	A725442
Cation Sum	meq/L	3.0	N/A	A725442
Cation/EC Ratio	N/A	11	0.10	A725441
Calculated Calcium (Ca)	mg/kg	1.7	0.52	A725443
Calculated Magnesium (Mg)	mg/kg	0.86	0.35	A725443
Calculated Sodium (Na)	mg/kg	20	0.87	A725443
Calculated Potassium (K)	mg/kg	1.3	0.45	A725443
Calculated Chloride (Cl)	mg/kg	<3.5	3.5	A725443
Calculated Sulphate (SO4)	mg/kg	28	1.7	A725443
Soluble Parameters				
Soluble Chloride (Cl)	mg/L	<10	10	A734293
Soluble Conductivity	dS/m	0.29	0.020	A734160
Soluble (CaCl2) pH	pH	5.67	N/A	A731688
Sodium Adsorption Ratio	N/A	5.2	0.10	A725412
Soluble Calcium (Ca)	mg/L	5.0	1.5	A733677
Soluble Magnesium (Mg)	mg/L	2.5	1.0	A733677
Soluble Sodium (Na)	mg/L	57	2.5	A733677
Soluble Potassium (K)	mg/L	3.8	1.3	A733677
Saturation %	%	35	N/A	A731680
Soluble Sulphate (SO4)	mg/L	82	5.0	A733677
Theoretical Gypsum Requirement	tonnes/ha	<0.20	0.20	A725444
RDL = Reportable Detection Limit N/A = Not Applicable				

Bureau Veritas - Partial/Rush Results



BUREAU
VERITAS

Bureau Veritas Job #: C272486
Report Date: 2022/10/01

GOLDER ASSOCIATES LTD
Client Project #: 21452763
Site Location: CAPITAL POWER HALKIRK 2
Sampler Initials: DB

PHYSICAL TESTING (SOIL)

Bureau Veritas ID		BCH625	BCH626	BCH626		
Sampling Date		2022/08/25	2022/08/25	2022/08/25		
COC Number		1 of 1	1 of 1	1 of 1		
	UNITS	CH22DB198-AH(0-17)	CH22DB198-BNJT(17-32)	CH22DB198-BNJT(17-32) Lab-Dup	RDL	QC Batch
Physical Properties						
% sand by hydrometer	%	50	49	49	2.0	A737153
% silt by hydrometer	%	34	25	25	2.0	A737153
Clay Content	%	16	26	26	2.0	A737153
Texture	N/A	LOAM	SNDY CL LO	N/A	N/A	A724642
RDL = Reportable Detection Limit Lab-Dup = Laboratory Initiated Duplicate N/A = Not Applicable						

Bureau Veritas ID		BCH627	BCH628	BCH629	BCH630		
Sampling Date		2022/08/25	2022/08/27	2022/08/27	2022/08/27		
COC Number		1 of 1	1 of 1	1 of 1	1 of 1		
	UNITS	CH22DB198-CK(32-100)	CH22DB009-AP(0-10)	CH22DB009-AB(10-27)	CH22DB009-BNT(27-45)	RDL	QC Batch
Physical Properties							
% sand by hydrometer	%	45	45	41	44	2.0	A737153
% silt by hydrometer	%	19	37	38	27	2.0	A737153
Clay Content	%	36	18	21	30	2.0	A737153
Texture	N/A	CLAY LOAM	LOAM	LOAM	CLAY LOAM	N/A	A724642
RDL = Reportable Detection Limit N/A = Not Applicable							

Bureau Veritas ID		BCH631	BCH632	BCH633	BCH634		
Sampling Date		2022/08/27	2022/08/28	2022/08/28	2022/08/28		
COC Number		1 of 1	1 of 1	1 of 1	1 of 1		
	UNITS	CH22DB009-CK(45-100)	CH22DB048-AP(0-45)	CH22DB048-AB(14-20)	CH22DB048-BNT(20-27)	RDL	QC Batch
Physical Properties							
% sand by hydrometer	%	41	48	47	41	2.0	A737153
% silt by hydrometer	%	27	32	31	24	2.0	A737153
Clay Content	%	33	21	21	36	2.0	A737153
Texture	N/A	CLAY LOAM	LOAM	LOAM	CLAY LOAM	N/A	A731080
RDL = Reportable Detection Limit N/A = Not Applicable							



BUREAU
VERITAS

Bureau Veritas Job #: C272486
Report Date: 2022/10/01

GOLDER ASSOCIATES LTD
Client Project #: 21452763
Site Location: CAPITAL POWER HALKIRK 2
Sampler Initials: DB

PHYSICAL TESTING (SOIL)

Bureau Veritas ID		BCH640	BCH641		
Sampling Date		2022/08/28	2022/08/29		
COC Number		2 of 2	2 of 2		
	UNITS	CH22DB048-CK(27-100)	CH22DBC105-BNT(16-24)	RDL	QC Batch
Physical Properties					
% sand by hydrometer	%	47	43	2.0	A737153
% silt by hydrometer	%	21	23	2.0	A737153
Clay Content	%	32	34	2.0	A737153
Texture	N/A	SNDY CL LO	CLAY LOAM	N/A	A731080
RDL = Reportable Detection Limit N/A = Not Applicable					

Bureau Veritas - Partial/Rush Results



GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	18.7°C
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Sample BCH625 [CH22DB198-AH(0-17)] : Sample was analyzed past method specified hold time for pH @25C (1:2 Calcium Chloride Extract). Sample was analyzed past method specified hold time for Chloride (Soluble). Sample was analyzed past method specified hold time for Conductivity @25C (Soluble). Sample was analyzed past method specified hold time for Texture by Hydrometer.

Sample BCH626 [CH22DB198-BNJT(17-32)] : Sample was analyzed past method specified hold time for pH @25C (1:2 Calcium Chloride Extract). Sample was analyzed past method specified hold time for Conductivity @25C (Soluble). Sample was analyzed past method specified hold time for Chloride (Soluble). SANDY CL LO = SANDY CLAY LOAM Sample was analyzed past method specified hold time for Texture by Hydrometer.

Sample BCH627 [CH22DB198-CK(32-100)] : Sample was analyzed past method specified hold time for pH @25C (1:2 Calcium Chloride Extract). Sample was analyzed past method specified hold time for Chloride (Soluble). Sample was analyzed past method specified hold time for Conductivity @25C (Soluble). Sample was analyzed past method specified hold time for Texture by Hydrometer.

Sample BCH628 [CH22DB009-AP(0-10)] : Sample was analyzed past method specified hold time for Conductivity @25C (Soluble). Sample was analyzed past method specified hold time for pH @25C (1:2 Calcium Chloride Extract). Sample was analyzed past method specified hold time for Chloride (Soluble). Sample was analyzed past method specified hold time for Texture by Hydrometer.

Sample BCH629 [CH22DB009-AB(10-27)] : Sample was analyzed past method specified hold time for pH @25C (1:2 Calcium Chloride Extract). Sample was analyzed past method specified hold time for Chloride (Soluble). Sample was analyzed past method specified hold time for Conductivity @25C (Soluble). Sample was analyzed past method specified hold time for Texture by Hydrometer.

Sample BCH630 [CH22DB009-BNT(27-45)] : Sample was analyzed past method specified hold time for pH @25C (1:2 Calcium Chloride Extract). Sample was analyzed past method specified hold time for Conductivity @25C (Soluble). Sample was analyzed past method specified hold time for Chloride (Soluble). Sample was analyzed past method specified hold time for Texture by Hydrometer.

Sample BCH631 [CH22DB009-CK(45-100)] : Sample was analyzed past method specified hold time for pH @25C (1:2 Calcium Chloride Extract). Sample was analyzed past method specified hold time for Chloride (Soluble). Sample was analyzed past method specified hold time for Conductivity @25C (Soluble). Sample was analyzed past method specified hold time for Texture by Hydrometer.

Sample BCH640 [CH22DB048-CK(27-100)] : SANDY CL LO = SANDY CLAY LOAM

Results relate only to the items tested.

Bureau Veritas - Partial/Rush Results



BUREAU VERITAS

Bureau Veritas Job #: C272486
Report Date: 2022/10/01

GOLDER ASSOCIATES LTD
Client Project #: 21452763
Site Location: CAPITAL POWER HALKIRK 2
Sampler Initials: DB

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
A731587	JKV	QC Standard	Saturation %	2022/09/27		105	%	75 - 125
A731587	JKV	RPD	Saturation %	2022/09/27	6.2		%	12
A731590	STB	QC Standard	Soluble (CaCl2) pH	2022/09/27		100	%	97 - 103
A731590	STB	Spiked Blank	Soluble (CaCl2) pH	2022/09/27		100	%	97 - 103
A731590	STB	RPD	Soluble (CaCl2) pH	2022/09/27	0.26		%	N/A
A731680	JKV	QC Standard	Saturation %	2022/09/27		97	%	75 - 125
A731680	JKV	RPD	Saturation %	2022/09/27	1.9		%	12
			Saturation %	2022/09/27	1.4		%	12
A731688	LZO	QC Standard	Soluble (CaCl2) pH	2022/09/27		100	%	97 - 103
A731688	LZO	Spiked Blank	Soluble (CaCl2) pH	2022/09/27		100	%	97 - 103
A731688	LZO	RPD	Soluble (CaCl2) pH	2022/09/27	0		%	N/A
A732071	JKV	QC Standard	Saturation %	2022/09/27		100	%	75 - 125
A732071	JKV	RPD	Saturation %	2022/09/27	2.6		%	12
A732076	LZO	QC Standard	Soluble (CaCl2) pH	2022/09/28		100	%	97 - 103
A732076	LZO	Spiked Blank	Soluble (CaCl2) pH	2022/09/28		100	%	97 - 103
A732076	LZO	RPD	Soluble (CaCl2) pH	2022/09/28	0.065		%	N/A
A732521	ZI	Matrix Spike	Soluble Chloride (Cl)	2022/09/27		103	%	75 - 125
A732521	ZI	QC Standard	Soluble Chloride (Cl)	2022/09/27		91	%	75 - 125
A732521	ZI	Spiked Blank	Soluble Chloride (Cl)	2022/09/27		109	%	80 - 120
A732521	ZI	Method Blank	Soluble Chloride (Cl)	2022/09/27	<10		mg/L	
A732521	ZI	RPD	Soluble Chloride (Cl)	2022/09/27	NC		%	30
A732555	SJK	Matrix Spike	Soluble Calcium (Ca)	2022/09/27		98	%	75 - 125
			Soluble Magnesium (Mg)	2022/09/27		99	%	75 - 125
			Soluble Sodium (Na)	2022/09/27		95	%	75 - 125
			Soluble Potassium (K)	2022/09/27		94	%	75 - 125
A732555	SJK	QC Standard	Soluble Calcium (Ca)	2022/09/27		84	%	75 - 125
			Soluble Magnesium (Mg)	2022/09/27		88	%	75 - 125
			Soluble Sodium (Na)	2022/09/27		93	%	75 - 125
			Soluble Potassium (K)	2022/09/27		98	%	75 - 125
			Soluble Sulphate (SO4)	2022/09/27		86	%	75 - 125
A732555	SJK	Spiked Blank	Soluble Calcium (Ca)	2022/09/27		98	%	80 - 120
			Soluble Magnesium (Mg)	2022/09/27		98	%	80 - 120
			Soluble Sodium (Na)	2022/09/27		96	%	80 - 120
			Soluble Potassium (K)	2022/09/27		94	%	80 - 120
A732555	SJK	Method Blank	Soluble Calcium (Ca)	2022/09/27	<1.5		mg/L	
			Soluble Magnesium (Mg)	2022/09/27	<1.0		mg/L	
			Soluble Sodium (Na)	2022/09/27	<2.5		mg/L	
			Soluble Potassium (K)	2022/09/27	<1.3		mg/L	
			Soluble Sulphate (SO4)	2022/09/27	<5.0		mg/L	
A732555	SJK	RPD	Soluble Calcium (Ca)	2022/09/27	0.55		%	30
			Soluble Magnesium (Mg)	2022/09/27	0.0070		%	30
			Soluble Sodium (Na)	2022/09/27	0.58		%	30
			Soluble Potassium (K)	2022/09/27	0.77		%	30
			Soluble Sulphate (SO4)	2022/09/27	1.2		%	30
A732604	EBO	QC Standard	Soluble Conductivity	2022/09/27		102	%	75 - 125
A732604	EBO	Spiked Blank	Soluble Conductivity	2022/09/27		99	%	90 - 110
A732604	EBO	Method Blank	Soluble Conductivity	2022/09/27	<0.020		dS/m	
A732604	EBO	RPD	Soluble Conductivity	2022/09/27	1.6		%	20
A732999	SJK	Matrix Spike	Soluble Calcium (Ca)	2022/09/28		99	%	75 - 125
			Soluble Magnesium (Mg)	2022/09/28		97	%	75 - 125
			Soluble Sodium (Na)	2022/09/28		94	%	75 - 125
			Soluble Potassium (K)	2022/09/28		94	%	75 - 125
A732999	SJK	QC Standard	Soluble Calcium (Ca)	2022/09/28		88	%	75 - 125

Bureau Veritas - Partial/Rush Results



BUREAU VERITAS

Bureau Veritas Job #: C272486
Report Date: 2022/10/01

GOLDER ASSOCIATES LTD
Client Project #: 21452763
Site Location: CAPITAL POWER HALKIRK 2
Sampler Initials: DB

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC	Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
				Soluble Magnesium (Mg)	2022/09/28		89	%	75 - 125
				Soluble Sodium (Na)	2022/09/28		96	%	75 - 125
				Soluble Potassium (K)	2022/09/28		104	%	75 - 125
				Soluble Sulphate (SO4)	2022/09/28		84	%	75 - 125
A732999	SJK		Spiked Blank	Soluble Calcium (Ca)	2022/09/28		100	%	80 - 120
				Soluble Magnesium (Mg)	2022/09/28		97	%	80 - 120
				Soluble Sodium (Na)	2022/09/28		95	%	80 - 120
				Soluble Potassium (K)	2022/09/28		95	%	80 - 120
A732999	SJK		Method Blank	Soluble Calcium (Ca)	2022/09/28	<1.5		mg/L	
				Soluble Magnesium (Mg)	2022/09/28	<1.0		mg/L	
				Soluble Sodium (Na)	2022/09/28	<2.5		mg/L	
				Soluble Potassium (K)	2022/09/28	<1.3		mg/L	
				Soluble Sulphate (SO4)	2022/09/28	<5.0		mg/L	
A732999	SJK		RPD	Soluble Calcium (Ca)	2022/09/28	55 (1)		%	30
				Soluble Magnesium (Mg)	2022/09/28	46 (1)		%	30
				Soluble Sodium (Na)	2022/09/28	25		%	30
				Soluble Potassium (K)	2022/09/28	27		%	30
				Soluble Sulphate (SO4)	2022/09/28	29		%	30
A733677	SJK		Matrix Spike	Soluble Calcium (Ca)	2022/09/28		97	%	75 - 125
				Soluble Magnesium (Mg)	2022/09/28		97	%	75 - 125
				Soluble Sodium (Na)	2022/09/28		93	%	75 - 125
				Soluble Potassium (K)	2022/09/28		97	%	75 - 125
A733677	SJK		QC Standard	Soluble Calcium (Ca)	2022/09/28		82	%	75 - 125
				Soluble Magnesium (Mg)	2022/09/28		84	%	75 - 125
				Soluble Sodium (Na)	2022/09/28		87	%	75 - 125
				Soluble Potassium (K)	2022/09/28		86	%	75 - 125
				Soluble Sulphate (SO4)	2022/09/28		81	%	75 - 125
A733677	SJK		Spiked Blank	Soluble Calcium (Ca)	2022/09/28		98	%	80 - 120
				Soluble Magnesium (Mg)	2022/09/28		97	%	80 - 120
				Soluble Sodium (Na)	2022/09/28		94	%	80 - 120
				Soluble Potassium (K)	2022/09/28		97	%	80 - 120
A733677	SJK		Method Blank	Soluble Calcium (Ca)	2022/09/28	<1.5		mg/L	
				Soluble Magnesium (Mg)	2022/09/28	<1.0		mg/L	
				Soluble Sodium (Na)	2022/09/28	<2.5		mg/L	
				Soluble Potassium (K)	2022/09/28	<1.3		mg/L	
				Soluble Sulphate (SO4)	2022/09/28	<5.0		mg/L	
A733677	SJK		RPD	Soluble Calcium (Ca)	2022/09/28	6.7		%	30
				Soluble Magnesium (Mg)	2022/09/28	6.8		%	30
				Soluble Sodium (Na)	2022/09/28	0.33		%	30
				Soluble Potassium (K)	2022/09/28	0.0090		%	30
				Soluble Sulphate (SO4)	2022/09/28	2.8		%	30
A733776	ZI		Matrix Spike	Soluble Chloride (Cl)	2022/09/28		107	%	75 - 125
A733776	ZI		QC Standard	Soluble Chloride (Cl)	2022/09/28		97	%	75 - 125
A733776	ZI		Spiked Blank	Soluble Chloride (Cl)	2022/09/28		106	%	80 - 120
A733776	ZI		Method Blank	Soluble Chloride (Cl)	2022/09/28	<10		mg/L	
A733776	ZI		RPD	Soluble Chloride (Cl)	2022/09/28	23		%	30
A733836	EBO		QC Standard	Soluble Conductivity	2022/09/28		100	%	75 - 125
A733836	EBO		Spiked Blank	Soluble Conductivity	2022/09/28		99	%	90 - 110
A733836	EBO		Method Blank	Soluble Conductivity	2022/09/28	<0.020		dS/m	
A733836	EBO		RPD	Soluble Conductivity	2022/09/28	15		%	20
A734160	EBO		QC Standard	Soluble Conductivity	2022/09/28		101	%	75 - 125
A734160	EBO		Spiked Blank	Soluble Conductivity	2022/09/28		99	%	90 - 110
A734160	EBO		Method Blank	Soluble Conductivity	2022/09/28	<0.020		dS/m	

Bureau Veritas - Partial/Rush Results



BUREAU
VERITAS

Bureau Veritas Job #: C272486
Report Date: 2022/10/01

GOLDER ASSOCIATES LTD
Client Project #: 21452763
Site Location: CAPITAL POWER HALKIRK 2
Sampler Initials: DB

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
A734160	EBO	RPD	Soluble Conductivity	2022/09/28	6.7		%	20
A734293	ZI	Matrix Spike	Soluble Chloride (Cl)	2022/09/28		106	%	75 - 125
A734293	ZI	QC Standard	Soluble Chloride (Cl)	2022/09/28		91	%	75 - 125
A734293	ZI	Spiked Blank	Soluble Chloride (Cl)	2022/09/28		100	%	80 - 120
A734293	ZI	Method Blank	Soluble Chloride (Cl)	2022/09/28	<10		mg/L	
A734293	ZI	RPD	Soluble Chloride (Cl)	2022/09/28	NC		%	30
A737153	SJA	QC Standard	% sand by hydrometer	2022/10/01		106	%	75 - 125
			% silt by hydrometer	2022/10/01		107	%	75 - 125
			Clay Content	2022/10/01		87	%	75 - 125
A737153	SJA	RPD [BCH626-01]	% sand by hydrometer	2022/10/01	0.91		%	30
			% silt by hydrometer	2022/10/01	1.2		%	30
			Clay Content	2022/10/01	0.51		%	30

N/A = Not Applicable

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference <= 2x RDL).

(1) Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.

Bureau Veritas - Partial/Rush Results



BUREAU
VERITAS

Bureau Veritas Job #: C272486
Report Date: 2022/10/01

GOLDER ASSOCIATES LTD
Client Project #: 21452763
Site Location: CAPITAL POWER HALKIRK 2
Sampler Initials: DB

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:

Ghayasuddin Khan, M.Sc., P.Chem., QP, Scientific Specialist, Inorganics



Bureau Veritas Proprietary Software
Logiciel Propriétaire de Bureau Veritas

Automated Statchk

Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Bureau Veritas - Partial/Rush Results



Calgary: 4000 19th St. NE, T2E 6P8. Toll Free (800) 386-7247
 Edmonton: 9331-48 St. T6B 2R4. Toll Free (800) 386-7247
 bvlab.com

CHAIN OF CUSTODY RECORD

Report Information		Comments				Analysis Requested														Same as CoC	
Company: <u>Golder Associates LTD.</u>						# of containers	BTEX F1 <input type="checkbox"/>	BTEX F1-F2 <input type="checkbox"/>	BTEX F1-F4 <input type="checkbox"/>	Routine Water <input type="checkbox"/>	Regulated Metals Tot. <input type="checkbox"/>	Mercury <input type="checkbox"/>	Salinity 4 <input type="checkbox"/>	Sieve (75 micron) <input type="checkbox"/>	Texture (% Sand, Silt, Clay) <input type="checkbox"/>	Basic Class II Landfill <input type="checkbox"/>	CEC - exchangeable Ca/Na <input type="checkbox"/>	TDC <input type="checkbox"/>	Dissolved <input type="checkbox"/>	HOLD - DO NOT ANALYZE	Project/LSD
Contact: <u>Claire Kisko</u>																					Special Instructions
Phone: _____																					
Email: <u>claire.kisko@wsp.com</u>																					
Sampled by: _____																					
Sample Identification	Depth (Unit)	Date Sampled (YYYY/MM/DD)	Time Sampled (HH:MM)	Matrix																	
11	CH22DB048-Ck(27-100)	27-100	2022-08-28	SOIL																	X
12	CH22DBC105-Bnt(16-24)	16-24	2022-08-29	SOIL																	X
13																					
14																					
15																					
16																					
17																					
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Please indicate Filtered, Preserved or Both (F, P, F/P)

Relinquished by: (Signature/Print)	DATE (YYYY/MM/DD)	Time (HH:MM)	Received by: (Signature/Print)	DATE (YYYY/MM/DD)	Time (HH:MM)	BV Job #
David Brown	2022-09-20	12:00	JASON SIV	2022 09 20	1515	C272486

Unless otherwise agreed to in writing, work submitted on this Chain of Custody is subject to Bureau Veritas Laboratories' standard Terms and Conditions. Signing of this Chain of Custody document is acknowledgment and acceptance of our terms which are available for viewing at <http://www.bvlab.com/terms-and-conditions>



Your Project #: 21452763
 Site Location: CAPITAL POWER HALKIRK 2
 Your C.O.C. #: 1 of 1, 2 of 2

Attention: Claire Kisko
 GOLDR ASSOCIATES LTD
 16820-107 AVE
 EDMONTON, AB
 CANADA T5P 4C3

Report Date: 2022/10/04
 Report #: R3242840
 Version: 3 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C272486

Received: 2022/09/20, 15:15

Sample Matrix: Soil
 # Samples Received: 12

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Cation/EC Ratio	12	N/A	2022/09/28		Auto Calc
Cation Exchange Capacity (1)	4	2022/09/21	2022/09/27		Auto Calc
Chloride (Soluble)	7	2022/09/27	2022/09/27	AB SOP-00033 / AB SOP-00020	SM 23-4500-Cl-E m
Chloride (Soluble)	5	2022/09/27	2022/09/28	AB SOP-00033 / AB SOP-00020	SM 23-4500-Cl-E m
Conductivity @25C (Soluble)	7	2022/09/27	2022/09/27	AB SOP-00033 / AB SOP-00004	SM 23 2510 B m
Conductivity @25C (Soluble)	1	2022/09/27	2022/09/28	AB SOP-00033 / AB SOP-00004	SM 23 2510 B m
Conductivity @25C (Soluble)	4	2022/09/28	2022/09/28	AB SOP-00033 / AB SOP-00004	SM 23 2510 B m
Sum of Cations, Anions	12	N/A	2022/09/28		Auto Calc
pH @25C (1:2 Calcium Chloride Extract)	11	2022/09/27	2022/09/27	AB SOP-00033 / AB SOP-00006	SM 23 4500 H+B m
pH @25C (1:2 Calcium Chloride Extract)	1	2022/09/28	2022/09/28	AB SOP-00033 / AB SOP-00006	SM 23 4500 H+B m
Sodium Adsorption Ratio	12	N/A	2022/09/28		Auto Calc
Soluble Ions	7	2022/09/27	2022/09/27	AB SOP-00033 / AB SOP-00042	EPA 6010d R5 m
Soluble Ions	5	2022/09/27	2022/09/28	AB SOP-00033 / AB SOP-00042	EPA 6010d R5 m
Soluble Paste	12	2022/09/27	2022/09/27	AB SOP-00033	Carter 2nd ed 15.2 m
Soluble Ions Calculation	12	N/A	2022/09/27		Auto Calc
Total Organic Carbon LECO Method	3	N/A	2022/10/04	CAL SOP-00243	LECO 203-821-498 m
Texture by Hydrometer	12	N/A	2022/10/01	AB SOP-00030	Carter 2nd ed 55.3 m
Texture Class	12	N/A	2022/10/01		Auto Calc
Theoretical Gypsum Requirement (2)	12	N/A	2022/09/28		Auto Calc

Remarks:

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, MELCC, EPA, APHA.



Your Project #: 21452763
Site Location: CAPITAL POWER HALKIRK 2
Your C.O.C. #: 1 of 1, 2 of 2

Attention: Claire Kisko

GOLDER ASSOCIATES LTD
16820-107 AVE
EDMONTON, AB
CANADA T5P 4C3

Report Date: 2022/10/04
Report #: R3242840
Version: 3 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C272486

Received: 2022/09/20, 15:15

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

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Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.

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Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

(1) Sample(s) analyzed using accredited methodologies and have been subjected to Bureau Veritas's standard validation process for the submitted matrix however this is not accredited for this matrix.

(2) TGR calculation is based on a theoretical SAR of 4. Salt Contamination and Assessment and remediation guideline 2001 recommended SAR is ranging 4-8. TGR is reported in tonnes/ha.

Encryption Key



**AUTHORIZED REPORT
RAPPORT AUTORISÉ**

Bureau Veritas
04 Oct 2022 10:58:45

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

Cynny Hagen, Key Account Specialist
Email: Cynny.HAGEN@bureauveritas.com
Phone# (403)735-2273

=====
Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation please refer to the Validation Signature Page.



RESULTS OF CHEMICAL ANALYSES OF SOIL

Bureau Veritas ID		BCH625			BCH626		
Sampling Date		2022/08/25			2022/08/25		
COC Number		1 of 1			1 of 1		
	UNITS	CH22DB198-AH(0-17)	RDL	QC Batch	CH22DB198-BNJT(17-32)	RDL	QC Batch
Calculated Parameters							
Anion Sum	meq/L	1.4	N/A	A725442	25	N/A	A725442
Cation Sum	meq/L	3.2	N/A	A725442	27	N/A	A725442
Cation/EC Ratio	N/A	8.9	0.10	A725441	9.5	0.10	A725441
Calculated Calcium (Ca)	mg/kg	1.0	0.66	A725443	11	0.69	A725443
Calculated Magnesium (Mg)	mg/kg	0.93	0.44	A725443	7.8	0.46	A725443
Calculated Sodium (Na)	mg/kg	28	1.1	A725443	260	1.1	A725443
Calculated Potassium (K)	mg/kg	1.6	0.57	A725443	1.4	0.60	A725443
Calculated Chloride (Cl)	mg/kg	<4.4	4.4	A725443	<4.6	4.6	A725443
Calculated Sulphate (SO4)	mg/kg	29	2.2	A725443	560	2.3	A725443
Elements							
Cation exchange capacity	cmol+/Kg				20	10	A731076
Soluble Parameters							
Soluble Chloride (Cl)	mg/L	<10	10	A732521	<10	10	A734293
Soluble Conductivity	dS/m	0.36	0.020	A732604	2.9	0.020	A734160
Soluble (CaCl2) pH	pH	4.66	N/A	A731590	6.78	N/A	A731688
Sodium Adsorption Ratio	N/A	7.3	0.10	A725412	22	0.10	A725412
Soluble Calcium (Ca)	mg/L	2.3	1.5	A732555	24	1.5	A733677
Soluble Magnesium (Mg)	mg/L	2.1	1.0	A732555	17	1.0	A733677
Soluble Sodium (Na)	mg/L	64	2.5	A732555	570	2.5	A733677
Soluble Potassium (K)	mg/L	3.8	1.3	A732555	3.1	1.3	A733677
Saturation %	%	44	N/A	A731587	46	N/A	A731680
Soluble Sulphate (SO4)	mg/L	66	5.0	A732555	1200	5.0	A733677
Theoretical Gypsum Requirement	tonnes/ha	<0.20	0.20	A725444	5.6	0.20	A725444
RDL = Reportable Detection Limit N/A = Not Applicable							



BUREAU
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Bureau Veritas Job #: C272486
Report Date: 2022/10/04

GOLDER ASSOCIATES LTD
Client Project #: 21452763
Site Location: CAPITAL POWER HALKIRK 2
Sampler Initials: DB

RESULTS OF CHEMICAL ANALYSES OF SOIL

Bureau Veritas ID		BCH627			BCH628		
Sampling Date		2022/08/25			2022/08/27		
COC Number		1 of 1			1 of 1		
	UNITS	CH22DB198-CK(32-100)	RDL	QC Batch	CH22DB009-AP(0-10)	RDL	QC Batch
Calculated Parameters							
Anion Sum	meq/L	170	N/A	A725442	0.45	N/A	A725442
Cation Sum	meq/L	170	N/A	A725442	6.9	N/A	A725442
Cation/EC Ratio	N/A	12	0.10	A725441	8.8	0.10	A725441
Calculated Calcium (Ca)	mg/kg	210	0.79	A725443	46	0.90	A725443
Calculated Magnesium (Mg)	mg/kg	170	0.53	A725443	11	0.60	A725443
Calculated Sodium (Na)	mg/kg	1500	1.3	A725443	14	1.5	A725443
Calculated Potassium (K)	mg/kg	5.0	0.68	A725443	14	0.78	A725443
Calculated Chloride (Cl)	mg/kg	<5.3	5.3	A725443	<6.0	6.0	A725443
Calculated Sulphate (SO4)	mg/kg	4300	2.6	A725443	13	3.0	A725443
Soluble Parameters							
Soluble Chloride (Cl)	mg/L	<10	10	A732521	<10	10	A733776
Soluble Conductivity	dS/m	13	0.020	A732604	0.79	0.020	A733836
Soluble (CaCl2) pH	pH	8.28	N/A	A731590	6.17	N/A	A732076
Sodium Adsorption Ratio	N/A	25	0.10	A725412	0.62	0.10	A725412
Soluble Calcium (Ca)	mg/L	390	1.5	A732555	76	1.5	A732999
Soluble Magnesium (Mg)	mg/L	320	1.0	A732555	19	1.0	A732999
Soluble Sodium (Na)	mg/L	2800	2.5	A732555	23	2.5	A732999
Soluble Potassium (K)	mg/L	9.4	1.3	A732555	23	1.3	A732999
Saturation %	%	53	N/A	A731587	60	N/A	A732071
Soluble Sulphate (SO4)	mg/L	8100	5.0	A732555	22	5.0	A732999
Theoretical Gypsum Requirement	tonnes/ha	160	0.20	A725444	<0.20	0.20	A725444
RDL = Reportable Detection Limit N/A = Not Applicable							



RESULTS OF CHEMICAL ANALYSES OF SOIL

Bureau Veritas ID		BCH629			BCH630		
Sampling Date		2022/08/27			2022/08/27		
COC Number		1 of 1			1 of 1		
	UNITS	CH22DB009-AB(10-27)	RDL	QC Batch	CH22DB009-BNT(27-45)	RDL	QC Batch
Calculated Parameters							
Anion Sum	meq/L	0.49	N/A	A725442	0.79	N/A	A725442
Cation Sum	meq/L	1.8	N/A	A725442	2.8	N/A	A725442
Cation/EC Ratio	N/A	11	0.10	A725441	12	0.10	A725441
Calculated Calcium (Ca)	mg/kg	5.2	0.74	A725443	8.1	0.60	A725443
Calculated Magnesium (Mg)	mg/kg	1.7	0.49	A725443	2.8	0.40	A725443
Calculated Sodium (Na)	mg/kg	11	1.2	A725443	10	1.0	A725443
Calculated Potassium (K)	mg/kg	<0.64	0.64	A725443	0.95	0.52	A725443
Calculated Chloride (Cl)	mg/kg	<4.9	4.9	A725443	<4.0	4.0	A725443
Calculated Sulphate (SO4)	mg/kg	12	2.5	A725443	15	2.0	A725443
Elements							
Cation exchange capacity	cmol+/Kg				18	10	A731076
Soluble Parameters							
Soluble Chloride (Cl)	mg/L	<10	10	A732521	<10	10	A734293
Soluble Conductivity	dS/m	0.16	0.020	A732604	0.22	0.020	A734160
Soluble (CaCl2) pH	pH	6.35	N/A	A731590	6.75	N/A	A731688
Sodium Adsorption Ratio	N/A	1.6	0.10	A725412	1.3	0.10	A725412
Soluble Calcium (Ca)	mg/L	11	1.5	A732555	20	1.5	A733677
Soluble Magnesium (Mg)	mg/L	3.5	1.0	A732555	6.9	1.0	A733677
Soluble Sodium (Na)	mg/L	23	2.5	A732555	26	2.5	A733677
Soluble Potassium (K)	mg/L	<1.3	1.3	A732555	2.4	1.3	A733677
Saturation %	%	49	N/A	A731587	40	N/A	A731680
Soluble Sulphate (SO4)	mg/L	24	5.0	A732555	38	5.0	A733677
Theoretical Gypsum Requirement	tonnes/ha	<0.20	0.20	A725444	<0.20	0.20	A725444
RDL = Reportable Detection Limit N/A = Not Applicable							



RESULTS OF CHEMICAL ANALYSES OF SOIL

Bureau Veritas ID		BCH631		BCH632		BCH633		
Sampling Date		2022/08/27		2022/08/28		2022/08/28		
COC Number		1 of 1		1 of 1		1 of 1		
	UNITS	CH22DB009-CK(45-100)	RDL	CH22DB048-AP(0-45)	RDL	CH22DB048-AB(14-20)	RDL	QC Batch
Calculated Parameters								
Anion Sum	meq/L	45	N/A	0.76	N/A	0.64	N/A	A725442
Cation Sum	meq/L	48	N/A	4.2	N/A	2.5	N/A	A725442
Cation/EC Ratio	N/A	14	0.10	8.3	0.10	8.3	0.10	A725441
Calculated Calcium (Ca)	mg/kg	190	0.58	12	0.65	2.4	0.52	A725443
Calculated Magnesium (Mg)	mg/kg	94	0.39	4.3	0.43	1.4	0.35	A725443
Calculated Sodium (Na)	mg/kg	28	0.97	14	1.1	14	0.87	A725443
Calculated Potassium (K)	mg/kg	3.3	0.51	8.6	0.56	1.0	0.45	A725443
Calculated Chloride (Cl)	mg/kg	<3.9	3.9	<4.3	4.3	<3.5	3.5	A725443
Calculated Sulphate (SO4)	mg/kg	840	1.9	16	2.2	11	1.7	A725443
Soluble Parameters								
Soluble Chloride (Cl)	mg/L	<10	10	<10	10	<10	10	A732521
Soluble Conductivity	dS/m	3.4	0.020	0.50	0.020	0.30	0.020	A732604
Soluble (CaCl2) pH	pH	7.87	N/A	4.77	N/A	4.84	N/A	A731590
Sodium Adsorption Ratio	N/A	0.65	0.10	1.3	0.10	2.9	0.10	A725412
Soluble Calcium (Ca)	mg/L	490	1.5	28	1.5	6.9	1.5	A732555
Soluble Magnesium (Mg)	mg/L	240	1.0	10	1.0	4.0	1.0	A732555
Soluble Sodium (Na)	mg/L	71	2.5	32	2.5	39	2.5	A732555
Soluble Potassium (K)	mg/L	8.5	1.3	20	1.3	2.9	1.3	A732555
Saturation %	%	39	N/A	43	N/A	35	N/A	A731587
Soluble Sulphate (SO4)	mg/L	2200	5.0	37	5.0	31	5.0	A732555
Theoretical Gypsum Requirement	tonnes/ha	<0.20	0.20	<0.20	0.20	<0.20	0.20	A725444
RDL = Reportable Detection Limit N/A = Not Applicable								



BUREAU
VERITAS

Bureau Veritas Job #: C272486
Report Date: 2022/10/04

GOLDER ASSOCIATES LTD
Client Project #: 21452763
Site Location: CAPITAL POWER HALKIRK 2
Sampler Initials: DB

RESULTS OF CHEMICAL ANALYSES OF SOIL

Bureau Veritas ID		BCH634			BCH640		
Sampling Date		2022/08/28			2022/08/28		
COC Number		1 of 1			2 of 2		
	UNITS	CH22DB048-BNT(20-27)	RDL	QC Batch	CH22DB048-CK(27-100)	RDL	QC Batch
Calculated Parameters							
Anion Sum	meq/L	1.1	N/A	A725442	48	N/A	A725442
Cation Sum	meq/L	2.8	N/A	A725442	51	N/A	A725442
Cation/EC Ratio	N/A	11	0.10	A725441	13	0.10	A725441
Calculated Calcium (Ca)	mg/kg	2.4	0.49	A725443	190	0.62	A725443
Calculated Magnesium (Mg)	mg/kg	1.2	0.33	A725443	86	0.41	A725443
Calculated Sodium (Na)	mg/kg	16	0.82	A725443	97	1.0	A725443
Calculated Potassium (K)	mg/kg	0.57	0.43	A725443	4.9	0.54	A725443
Calculated Chloride (Cl)	mg/kg	<3.3	3.3	A725443	<4.1	4.1	A725443
Calculated Sulphate (SO4)	mg/kg	17	1.6	A725443	960	2.1	A725443
Elements							
Cation exchange capacity	cmol+/Kg	21	10	A731076			
Soluble Parameters							
Soluble Chloride (Cl)	mg/L	<10	10	A734293	<10	10	A732521
Soluble Conductivity	dS/m	0.25	0.020	A734160	3.9	0.020	A732604
Soluble (CaCl2) pH	pH	6.88	N/A	A731688	7.96	N/A	A731590
Sodium Adsorption Ratio	N/A	3.6	0.10	A725412	2.3	0.10	A725412
Soluble Calcium (Ca)	mg/L	7.4	1.5	A733677	470	1.5	A732555
Soluble Magnesium (Mg)	mg/L	3.6	1.0	A733677	210	1.0	A732555
Soluble Sodium (Na)	mg/L	48	2.5	A733677	240	2.5	A732555
Soluble Potassium (K)	mg/L	1.7	1.3	A733677	12	1.3	A732555
Saturation %	%	33	N/A	A731680	41	N/A	A731587
Soluble Sulphate (SO4)	mg/L	51	5.0	A733677	2300	5.0	A732555
Theoretical Gypsum Requirement	tonnes/ha	<0.20	0.20	A725444	<0.20	0.20	A725444
RDL = Reportable Detection Limit N/A = Not Applicable							



RESULTS OF CHEMICAL ANALYSES OF SOIL

Bureau Veritas ID		BCH641		
Sampling Date		2022/08/29		
COC Number		2 of 2		
	UNITS	CH22DBC105-BNT(16-24)	RDL	QC Batch
Calculated Parameters				
Anion Sum	meq/L	1.7	N/A	A725442
Cation Sum	meq/L	3.0	N/A	A725442
Cation/EC Ratio	N/A	11	0.10	A725441
Calculated Calcium (Ca)	mg/kg	1.7	0.52	A725443
Calculated Magnesium (Mg)	mg/kg	0.86	0.35	A725443
Calculated Sodium (Na)	mg/kg	20	0.87	A725443
Calculated Potassium (K)	mg/kg	1.3	0.45	A725443
Calculated Chloride (Cl)	mg/kg	<3.5	3.5	A725443
Calculated Sulphate (SO4)	mg/kg	28	1.7	A725443
Elements				
Cation exchange capacity	cmol+/Kg	17	10	A731076
Soluble Parameters				
Soluble Chloride (Cl)	mg/L	<10	10	A734293
Soluble Conductivity	dS/m	0.29	0.020	A734160
Soluble (CaCl2) pH	pH	5.67	N/A	A731688
Sodium Adsorption Ratio	N/A	5.2	0.10	A725412
Soluble Calcium (Ca)	mg/L	5.0	1.5	A733677
Soluble Magnesium (Mg)	mg/L	2.5	1.0	A733677
Soluble Sodium (Na)	mg/L	57	2.5	A733677
Soluble Potassium (K)	mg/L	3.8	1.3	A733677
Saturation %	%	35	N/A	A731680
Soluble Sulphate (SO4)	mg/L	82	5.0	A733677
Theoretical Gypsum Requirement	tonnes/ha	<0.20	0.20	A725444
RDL = Reportable Detection Limit N/A = Not Applicable				



BUREAU
VERITAS

Bureau Veritas Job #: C272486
Report Date: 2022/10/04

GOLDER ASSOCIATES LTD
Client Project #: 21452763
Site Location: CAPITAL POWER HALKIRK 2
Sampler Initials: DB

PHYSICAL TESTING (SOIL)

Bureau Veritas ID		BCH625	BCH626	BCH627	BCH628		
Sampling Date		2022/08/25	2022/08/25	2022/08/25	2022/08/27		
COC Number		1 of 1	1 of 1	1 of 1	1 of 1		
	UNITS	CH22DB198-AH(0-17)	CH22DB198-BNJT(17-32)	CH22DB198-CK(32-100)	CH22DB009-AP(0-10)	RDL	QC Batch

Physical Properties							
% sand by hydrometer	%	50	49	45	45	2.0	A737153
% silt by hydrometer	%	34	25	19	37	2.0	A737153
Clay Content	%	16	26	36	18	2.0	A737153
Texture	N/A	LOAM	SNDY CL LO	CLAY LOAM	LOAM	N/A	A724642

RDL = Reportable Detection Limit
N/A = Not Applicable

Bureau Veritas ID		BCH629	BCH630		BCH631		
Sampling Date		2022/08/27	2022/08/27		2022/08/27		
COC Number		1 of 1	1 of 1		1 of 1		
	UNITS	CH22DB009-AB(10-27)	CH22DB009-BNT(27-45)	QC Batch	CH22DB009-CK(45-100)	RDL	QC Batch

Physical Properties							
% sand by hydrometer	%	41	44	A737153	41	2.0	A737153
% silt by hydrometer	%	38	27	A737153	27	2.0	A737153
Clay Content	%	21	30	A737153	33	2.0	A737153
Texture	N/A	LOAM	CLAY LOAM	A724642	CLAY LOAM	N/A	A731080

RDL = Reportable Detection Limit
N/A = Not Applicable

Bureau Veritas ID		BCH632	BCH633	BCH634	BCH640		
Sampling Date		2022/08/28	2022/08/28	2022/08/28	2022/08/28		
COC Number		1 of 1	1 of 1	1 of 1	2 of 2		
	UNITS	CH22DB048-AP(0-45)	CH22DB048-AB(14-20)	CH22DB048-BNT(20-27)	CH22DB048-CK(27-100)	RDL	QC Batch

Physical Properties							
% sand by hydrometer	%	48	47	41	47	2.0	A737153
% silt by hydrometer	%	32	31	24	21	2.0	A737153
Clay Content	%	21	21	36	32	2.0	A737153
Texture	N/A	LOAM	LOAM	CLAY LOAM	SNDY CL LO	N/A	A731080

RDL = Reportable Detection Limit
N/A = Not Applicable



BUREAU
VERITAS

Bureau Veritas Job #: C272486
Report Date: 2022/10/04

GOLDER ASSOCIATES LTD
Client Project #: 21452763
Site Location: CAPITAL POWER HALKIRK 2
Sampler Initials: DB

PHYSICAL TESTING (SOIL)

Bureau Veritas ID		BCH641		
Sampling Date		2022/08/29		
COC Number		2 of 2		
	UNITS	CH22DBC105-BNT(16-24)	RDL	QC Batch
Physical Properties				
% sand by hydrometer	%	43	2.0	A737153
% silt by hydrometer	%	23	2.0	A737153
Clay Content	%	34	2.0	A737153
Texture	N/A	CLAY LOAM	N/A	A731080
RDL = Reportable Detection Limit N/A = Not Applicable				



BUREAU
VERITAS

Bureau Veritas Job #: C272486
Report Date: 2022/10/04

GOLDER ASSOCIATES LTD
Client Project #: 21452763
Site Location: CAPITAL POWER HALKIRK 2
Sampler Initials: DB

MISCELLANEOUS (SOIL)

Bureau Veritas ID		BCH625	BCH628	BCH632		
Sampling Date		2022/08/25	2022/08/27	2022/08/28		
COC Number		1 of 1	1 of 1	1 of 1		
	UNITS	CH22DB198-AH(0-17)	CH22DB009-AP(0-10)	CH22DB048-AP(0-45)	RDL	QC Batch
Misc. Inorganics						
Total Organic Carbon (C)	%	2.8	4.1	3.4	0.050	A740338
RDL = Reportable Detection Limit						



GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	18.7°C
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Sample BCH625 [CH22DB198-AH(0-17)] : Sample was analyzed past method specified hold time for pH @25C (1:2 Calcium Chloride Extract). Sample was analyzed past method specified hold time for Chloride (Soluble). Sample was analyzed past method specified hold time for Conductivity @25C (Soluble). Sample was analyzed past method specified hold time for Texture by Hydrometer. Sample was analyzed past method specified hold time for Total Organic Carbon LECO Method.

Sample BCH626 [CH22DB198-BNJT(17-32)] : Sample was analyzed past method specified hold time for pH @25C (1:2 Calcium Chloride Extract). Sample was analyzed past method specified hold time for Conductivity @25C (Soluble). Sample was analyzed past method specified hold time for Chloride (Soluble). SANDY CL LO = SANDY CLAY LOAM Sample was analyzed past method specified hold time for Texture by Hydrometer.

Sample BCH627 [CH22DB198-CK(32-100)] : Sample was analyzed past method specified hold time for pH @25C (1:2 Calcium Chloride Extract). Sample was analyzed past method specified hold time for Chloride (Soluble). Sample was analyzed past method specified hold time for Conductivity @25C (Soluble). Sample was analyzed past method specified hold time for Texture by Hydrometer.

Sample BCH628 [CH22DB009-AP(0-10)] : Sample was analyzed past method specified hold time for Conductivity @25C (Soluble). Sample was analyzed past method specified hold time for pH @25C (1:2 Calcium Chloride Extract). Sample was analyzed past method specified hold time for Chloride (Soluble). Sample was analyzed past method specified hold time for Texture by Hydrometer. Sample was analyzed past method specified hold time for Total Organic Carbon LECO Method.

Sample BCH629 [CH22DB009-AB(10-27)] : Sample was analyzed past method specified hold time for pH @25C (1:2 Calcium Chloride Extract). Sample was analyzed past method specified hold time for Chloride (Soluble). Sample was analyzed past method specified hold time for Conductivity @25C (Soluble). Sample was analyzed past method specified hold time for Texture by Hydrometer.

Sample BCH630 [CH22DB009-BNT(27-45)] : Sample was analyzed past method specified hold time for pH @25C (1:2 Calcium Chloride Extract). Sample was analyzed past method specified hold time for Conductivity @25C (Soluble). Sample was analyzed past method specified hold time for Chloride (Soluble). Sample was analyzed past method specified hold time for Texture by Hydrometer.

Sample BCH631 [CH22DB009-CK(45-100)] : Sample was analyzed past method specified hold time for pH @25C (1:2 Calcium Chloride Extract). Sample was analyzed past method specified hold time for Chloride (Soluble). Sample was analyzed past method specified hold time for Conductivity @25C (Soluble). Sample was analyzed past method specified hold time for Texture by Hydrometer.

Sample BCH632 [CH22DB048-AP(0-45)] : Sample was analyzed past method specified hold time for Total Organic Carbon LECO Method.

Sample BCH640 [CH22DB048-CK(27-100)] : SANDY CL LO = SANDY CLAY LOAM

Results relate only to the items tested.



BUREAU
VERITAS

Bureau Veritas Job #: C272486
Report Date: 2022/10/04

GOLDER ASSOCIATES LTD
Client Project #: 21452763
Site Location: CAPITAL POWER HALKIRK 2
Sampler Initials: DB

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
A731587	JKV	QC Standard	Saturation %	2022/09/27		105	%	75 - 125
A731587	JKV	RPD	Saturation %	2022/09/27	6.2		%	12
A731590	STB	QC Standard	Soluble (CaCl2) pH	2022/09/27		100	%	97 - 103
A731590	STB	Spiked Blank	Soluble (CaCl2) pH	2022/09/27		100	%	97 - 103
A731590	STB	RPD	Soluble (CaCl2) pH	2022/09/27	0.26		%	N/A
A731680	JKV	QC Standard	Saturation %	2022/09/27		97	%	75 - 125
A731680	JKV	RPD	Saturation %	2022/09/27	1.9		%	12
			Saturation %	2022/09/27	1.4		%	12
A731688	LZO	QC Standard	Soluble (CaCl2) pH	2022/09/27		100	%	97 - 103
A731688	LZO	Spiked Blank	Soluble (CaCl2) pH	2022/09/27		100	%	97 - 103
A731688	LZO	RPD	Soluble (CaCl2) pH	2022/09/27	0		%	N/A
A732071	JKV	QC Standard	Saturation %	2022/09/27		100	%	75 - 125
A732071	JKV	RPD	Saturation %	2022/09/27	2.6		%	12
A732076	LZO	QC Standard	Soluble (CaCl2) pH	2022/09/28		100	%	97 - 103
A732076	LZO	Spiked Blank	Soluble (CaCl2) pH	2022/09/28		100	%	97 - 103
A732076	LZO	RPD	Soluble (CaCl2) pH	2022/09/28	0.065		%	N/A
A732521	ZI	Matrix Spike	Soluble Chloride (Cl)	2022/09/27		103	%	75 - 125
A732521	ZI	QC Standard	Soluble Chloride (Cl)	2022/09/27		91	%	75 - 125
A732521	ZI	Spiked Blank	Soluble Chloride (Cl)	2022/09/27		109	%	80 - 120
A732521	ZI	Method Blank	Soluble Chloride (Cl)	2022/09/27	<10		mg/L	
A732521	ZI	RPD	Soluble Chloride (Cl)	2022/09/27	NC		%	30
A732555	SJK	Matrix Spike	Soluble Calcium (Ca)	2022/09/27		98	%	75 - 125
			Soluble Magnesium (Mg)	2022/09/27		99	%	75 - 125
			Soluble Sodium (Na)	2022/09/27		95	%	75 - 125
			Soluble Potassium (K)	2022/09/27		94	%	75 - 125
A732555	SJK	QC Standard	Soluble Calcium (Ca)	2022/09/27		84	%	75 - 125
			Soluble Magnesium (Mg)	2022/09/27		88	%	75 - 125
			Soluble Sodium (Na)	2022/09/27		93	%	75 - 125
			Soluble Potassium (K)	2022/09/27		98	%	75 - 125
			Soluble Sulphate (SO4)	2022/09/27		86	%	75 - 125
A732555	SJK	Spiked Blank	Soluble Calcium (Ca)	2022/09/27		98	%	80 - 120
			Soluble Magnesium (Mg)	2022/09/27		98	%	80 - 120
			Soluble Sodium (Na)	2022/09/27		96	%	80 - 120
			Soluble Potassium (K)	2022/09/27		94	%	80 - 120
A732555	SJK	Method Blank	Soluble Calcium (Ca)	2022/09/27	<1.5		mg/L	
			Soluble Magnesium (Mg)	2022/09/27	<1.0		mg/L	
			Soluble Sodium (Na)	2022/09/27	<2.5		mg/L	
			Soluble Potassium (K)	2022/09/27	<1.3		mg/L	
			Soluble Sulphate (SO4)	2022/09/27	<5.0		mg/L	
A732555	SJK	RPD	Soluble Calcium (Ca)	2022/09/27	0.55		%	30
			Soluble Magnesium (Mg)	2022/09/27	0.0070		%	30
			Soluble Sodium (Na)	2022/09/27	0.58		%	30
			Soluble Potassium (K)	2022/09/27	0.77		%	30
			Soluble Sulphate (SO4)	2022/09/27	1.2		%	30
A732604	EBO	QC Standard	Soluble Conductivity	2022/09/27		102	%	75 - 125
A732604	EBO	Spiked Blank	Soluble Conductivity	2022/09/27		99	%	90 - 110
A732604	EBO	Method Blank	Soluble Conductivity	2022/09/27	<0.020		dS/m	
A732604	EBO	RPD	Soluble Conductivity	2022/09/27	1.6		%	20
A732999	SJK	Matrix Spike	Soluble Calcium (Ca)	2022/09/28		99	%	75 - 125
			Soluble Magnesium (Mg)	2022/09/28		97	%	75 - 125
			Soluble Sodium (Na)	2022/09/28		94	%	75 - 125
			Soluble Potassium (K)	2022/09/28		94	%	75 - 125
A732999	SJK	QC Standard	Soluble Calcium (Ca)	2022/09/28		88	%	75 - 125



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Bureau Veritas Job #: C272486
Report Date: 2022/10/04

GOLDER ASSOCIATES LTD
Client Project #: 21452763
Site Location: CAPITAL POWER HALKIRK 2
Sampler Initials: DB

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
A732999	SJK	Spiked Blank	Soluble Magnesium (Mg)	2022/09/28		89	%	75 - 125
			Soluble Sodium (Na)	2022/09/28		96	%	75 - 125
			Soluble Potassium (K)	2022/09/28		104	%	75 - 125
			Soluble Sulphate (SO4)	2022/09/28		84	%	75 - 125
			Soluble Calcium (Ca)	2022/09/28		100	%	80 - 120
			Soluble Magnesium (Mg)	2022/09/28		97	%	80 - 120
			Soluble Sodium (Na)	2022/09/28		95	%	80 - 120
A732999	SJK	Method Blank	Soluble Potassium (K)	2022/09/28		95	%	80 - 120
			Soluble Calcium (Ca)	2022/09/28	<1.5		mg/L	
			Soluble Magnesium (Mg)	2022/09/28	<1.0		mg/L	
			Soluble Sodium (Na)	2022/09/28	<2.5		mg/L	
			Soluble Potassium (K)	2022/09/28	<1.3		mg/L	
A732999	SJK	RPD	Soluble Sulphate (SO4)	2022/09/28	<5.0		mg/L	
			Soluble Calcium (Ca)	2022/09/28	55 (1)	%	30	
			Soluble Magnesium (Mg)	2022/09/28	46 (1)	%	30	
			Soluble Sodium (Na)	2022/09/28	25	%	30	
			Soluble Potassium (K)	2022/09/28	27	%	30	
A733677	SJK	Matrix Spike	Soluble Sulphate (SO4)	2022/09/28	29	%	30	
			Soluble Calcium (Ca)	2022/09/28		97	%	75 - 125
			Soluble Magnesium (Mg)	2022/09/28		97	%	75 - 125
			Soluble Sodium (Na)	2022/09/28		93	%	75 - 125
A733677	SJK	QC Standard	Soluble Potassium (K)	2022/09/28		97	%	75 - 125
			Soluble Calcium (Ca)	2022/09/28		82	%	75 - 125
			Soluble Magnesium (Mg)	2022/09/28		84	%	75 - 125
			Soluble Sodium (Na)	2022/09/28		87	%	75 - 125
			Soluble Potassium (K)	2022/09/28		86	%	75 - 125
A733677	SJK	Spiked Blank	Soluble Sulphate (SO4)	2022/09/28		81	%	75 - 125
			Soluble Calcium (Ca)	2022/09/28		98	%	80 - 120
			Soluble Magnesium (Mg)	2022/09/28		97	%	80 - 120
			Soluble Sodium (Na)	2022/09/28		94	%	80 - 120
A733677	SJK	Method Blank	Soluble Potassium (K)	2022/09/28		97	%	80 - 120
			Soluble Calcium (Ca)	2022/09/28	<1.5		mg/L	
			Soluble Magnesium (Mg)	2022/09/28	<1.0		mg/L	
			Soluble Sodium (Na)	2022/09/28	<2.5		mg/L	
			Soluble Potassium (K)	2022/09/28	<1.3		mg/L	
A733677	SJK	RPD	Soluble Sulphate (SO4)	2022/09/28	<5.0		mg/L	
			Soluble Calcium (Ca)	2022/09/28	6.7	%	30	
			Soluble Magnesium (Mg)	2022/09/28	6.8	%	30	
			Soluble Sodium (Na)	2022/09/28	0.33	%	30	
			Soluble Potassium (K)	2022/09/28	0.0090	%	30	
A733776	ZI	Matrix Spike	Soluble Sulphate (SO4)	2022/09/28	2.8	%	30	
			Soluble Chloride (Cl)	2022/09/28		107	%	75 - 125
A733776	ZI	QC Standard	Soluble Chloride (Cl)	2022/09/28		97	%	75 - 125
A733776	ZI	Spiked Blank	Soluble Chloride (Cl)	2022/09/28		106	%	80 - 120
A733776	ZI	Method Blank	Soluble Chloride (Cl)	2022/09/28	<10		mg/L	
A733776	ZI	RPD	Soluble Chloride (Cl)	2022/09/28	23	%	30	
A733836	EBO	QC Standard	Soluble Conductivity	2022/09/28		100	%	75 - 125
A733836	EBO	Spiked Blank	Soluble Conductivity	2022/09/28		99	%	90 - 110
A733836	EBO	Method Blank	Soluble Conductivity	2022/09/28	<0.020		dS/m	
A733836	EBO	RPD	Soluble Conductivity	2022/09/28	15	%	20	
A734160	EBO	QC Standard	Soluble Conductivity	2022/09/28		101	%	75 - 125
A734160	EBO	Spiked Blank	Soluble Conductivity	2022/09/28		99	%	90 - 110
A734160	EBO	Method Blank	Soluble Conductivity	2022/09/28	<0.020		dS/m	



BUREAU
VERITAS

Bureau Veritas Job #: C272486
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GOLDER ASSOCIATES LTD
Client Project #: 21452763
Site Location: CAPITAL POWER HALKIRK 2
Sampler Initials: DB

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
A734160	EBO	RPD	Soluble Conductivity	2022/09/28	6.7		%	20
A734293	ZI	Matrix Spike	Soluble Chloride (Cl)	2022/09/28		106	%	75 - 125
A734293	ZI	QC Standard	Soluble Chloride (Cl)	2022/09/28		91	%	75 - 125
A734293	ZI	Spiked Blank	Soluble Chloride (Cl)	2022/09/28		100	%	80 - 120
A734293	ZI	Method Blank	Soluble Chloride (Cl)	2022/09/28	<10		mg/L	
A734293	ZI	RPD	Soluble Chloride (Cl)	2022/09/28	NC		%	30
A737153	SJA	QC Standard	% sand by hydrometer	2022/10/01		106	%	75 - 125
			% silt by hydrometer	2022/10/01		107	%	75 - 125
			Clay Content	2022/10/01		87	%	75 - 125
A737153	SJA	RPD [BCH626-01]	% sand by hydrometer	2022/10/01	0.91		%	30
			% silt by hydrometer	2022/10/01	1.2		%	30
			Clay Content	2022/10/01	0.51		%	30
A740338	PL	QC Standard	Total Organic Carbon (C)	2022/10/04		119	%	75 - 125
A740338	PL	Spiked Blank	Total Organic Carbon (C)	2022/10/04		96	%	80 - 120
A740338	PL	Method Blank	Total Organic Carbon (C)	2022/10/04	<0.050		%	
A740338	PL	RPD	Total Organic Carbon (C)	2022/10/04	3.3		%	35

N/A = Not Applicable

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference <= 2x RDL).

(1) Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.



BUREAU
VERITAS

Bureau Veritas Job #: C272486
Report Date: 2022/10/04

GOLDER ASSOCIATES LTD
Client Project #: 21452763
Site Location: CAPITAL POWER HALKIRK 2
Sampler Initials: DB

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:

Ghayasuddin Khan, M.Sc., P.Chem., QP, Scientific Specialist, Inorganics



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Logiciel Propriétaire de Bureau Veritas

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Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

908



Calgary: 4000 19th St. NE, T2E 6P8. Toll Free (800) 386-7247
 Edmonton: 9331-48 St. T6B 2R4. Toll Free (800) 386-7247
 bvlab.com

CHAIN OF CUSTODY RECORD

Invoice Information		Report Information (if differs from invoice)				Project Information				Turnaround Time (TAT) Required																																																														
Company: WSP Golder		Company:				Quotation #:				<input checked="" type="checkbox"/> 5 - 7 Days Regular (Most analyses)																																																														
Contact Name: Claire Kisko		Contact Name:				P.O. #/ AFE#:				PLEASE PROVIDE ADVANCE NOTICE FOR RUSH PROJECTS																																																														
Address: 106820 107 Ave NW Edmonton, AB, T5P 4C3		Address:				Project #: 21452763				Rush TAT (Surcharges will be applied)																																																														
Phone: 587-336-4040		Phone:				Site Location: Capital Power Halkirk 2				<input type="checkbox"/> Same Day <input type="checkbox"/> 2 Days <input type="checkbox"/> 1 Day <input type="checkbox"/> 3-4 Days																																																														
Email: claire.kisko@wsp.com		Email:				Site #:				Date Required:																																																														
Copies: sarah.clark@wsp.com		Copies:				Sampled By: David Brown				Rush Confirmation #:																																																														
Laboratory Use Only					Analysis Requested										Regulatory Criteria																																																									
<table border="1"> <tr> <th>Seal Present</th> <th>YES</th> <th>NO</th> <th>Cooler ID</th> <th>Temp</th> </tr> <tr> <td>Seal Present</td> <td><input checked="" type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> <td></td> <td>22 16 18</td> </tr> <tr> <td>Seal Intact</td> <td><input checked="" type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> <td></td> <td></td> </tr> <tr> <td>Cooling Media</td> <td><input checked="" type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> <td></td> <td></td> </tr> </table>					Seal Present	YES	NO	Cooler ID	Temp	Seal Present	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		22 16 18	Seal Intact	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			Cooling Media	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			<table border="1"> <tr> <th>Depot Reception</th> <th># of containers</th> <th>BTEX F1</th> <th>VOC</th> <th>BTEX F1-F2</th> <th>BTEX F1-F4</th> <th>Routine Water</th> <th>Regulated Metals Tot</th> <th>Diss</th> <th>Mercury Total</th> <th>Dissolved</th> <th>Salinity 4</th> <th>Stieve (75 micron)</th> <th>Texture (% Sand, Silt, Clay)</th> <th>Basic Class II Landfill</th> <th>CEC - exchangeable Ca/Na</th> <th>TOC</th> <th>HOLD - DO NOT ANALYZE</th> </tr> <tr> <td></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> </table>										Depot Reception	# of containers	BTEX F1	VOC	BTEX F1-F2	BTEX F1-F4	Routine Water	Regulated Metals Tot	Diss	Mercury Total	Dissolved	Salinity 4	Stieve (75 micron)	Texture (% Sand, Silt, Clay)	Basic Class II Landfill	CEC - exchangeable Ca/Na	TOC	HOLD - DO NOT ANALYZE		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> AT1 <input checked="" type="checkbox"/> CCME <input type="checkbox"/> Drinking Water <input type="checkbox"/> D50 (Drilling Waste) <input type="checkbox"/> Saskatchewan <input type="checkbox"/> Other:	
Seal Present	YES	NO	Cooler ID	Temp																																																																				
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Sample Identification					Depth (Unit)	Date Sampled (YYYY/MM/DD)	Time Sampled (HH:MM)	Matrix											Special Instructions																																																					
1	CH22DB198-Ah(0-17)				0-17	2022-08-25	-	soil	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>								<input checked="" type="checkbox"/>																																																						
2	CH22DB198-Bnjt(17-32)				17-32	2022-08-25	-	soil	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>					<input checked="" type="checkbox"/>																																																						
3	CH22DB198-Ck(32-100)				32-100	2022-08-25	-	soil	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>								<input checked="" type="checkbox"/>																																																						
4	CH22DB009-Ap(0-10)				0-10	2022-08-27	-	soil	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>							<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>																																																						
5	CH22DB009-AB(10-27)				10-27	2022-08-27	-	soil	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>								<input checked="" type="checkbox"/>																																																						
6	CH22DB009-Bnt(27-45)				27-45	2022-08-27	-	soil	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>					<input checked="" type="checkbox"/>																																																						
7	CH22DB009-Ck(45-100)				45-100	2022-08-27	-	soil	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>								<input checked="" type="checkbox"/>																																																						
8	CH22DB048-Ap(0-14)				0-14	2022-08-28	-	soil	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>							<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>																																																						
9	CH22DB048-AB(14-20)				14-20	2022-08-28	-	soil	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>								<input checked="" type="checkbox"/>																																																						
10	CH22DB048-Bnt(20-27)				20-27	2022-08-28	-	soil	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>					<input checked="" type="checkbox"/>																																																						
Please indicate Filtered, Preserved or Both (F, P, F/P)																																																																								
Relinquished by: (Signature/ Print)					DATE (YYYY/MM/DD)		Time (HH:MM)		Received by: (Signature/ Print)				DATE (YYYY/MM/DD)		Time (HH:MM)		BV Job #																																																							
David Brown					2022-09-20		12:00		JASON BIL				2022/09/20		15:15		C272486																																																							
<small>Unless otherwise agreed to in writing, work submitted on this Chain of Custody is subject to Bureau Veritas Laboratories' standard Terms and Conditions. Signing of this Chain of Custody document is acknowledgment and acceptance of our terms which are available for viewing at http://www.bvlab.com/terms-and-conditions</small>																																																																								



Bureau Veritas - Partial/Rush Results

Your Project #: 21452763
Site Location: CAPITAL POWER HALKIRK 2
Your C.O.C. #: 1 of 1, 2 of 2

Attention: Claire Kisko
GOLDER ASSOCIATES LTD
16820-107 AVE
EDMONTON, AB
CANADA T5P 4C3

Report Date: 2022/10/04
Report #: R3242839
Version: 2 - Partial

CERTIFICATE OF ANALYSIS – PARTIAL RESULTS

BUREAU VERITAS JOB #: C272486

Received: 2022/09/20, 15:15

Sample Matrix: Soil
Samples Received: 7

Analyses	Quantity	Date	Date	Laboratory Method	Analytical Method
		Extracted	Analyzed		
Cation Exchange Capacity (1)	4	2022/09/21	2022/09/27		Auto Calc
Total Organic Carbon LECO Method	3	N/A	2022/10/04	CAL SOP-00243	LECO 203-821-498 m

Remarks:

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, MELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.

Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.

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Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

(1) Sample(s) analyzed using accredited methodologies and have been subjected to Bureau Veritas's standard validation process for the submitted matrix however this is not accredited for this matrix.



Bureau Veritas - Partial/Rush Results

Your Project #: 21452763
Site Location: CAPITAL POWER HALKIRK 2
Your C.O.C. #: 1 of 1, 2 of 2

Attention: Claire Kisko
GOLDER ASSOCIATES LTD
16820-107 AVE
EDMONTON, AB
CANADA T5P 4C3

Report Date: 2022/10/04
Report #: R3242839
Version: 2 - Partial

CERTIFICATE OF ANALYSIS – PARTIAL RESULTS

BUREAU VERITAS JOB #: C272486

Received: 2022/09/20, 15:15

Encryption Key



**AUTHORIZED REPORT
RAPPORT AUTORISÉ**

Bureau Veritas
04 Oct 2022 10:55:08

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Cynny Hagen, Key Account Soecialist
Email: Cynny.HAGEN@bureauveritas.com
Phone# (403)735-2273

=====

Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports.
For Service Group specific validation please refer to the Validation Signature Page.



RESULTS OF CHEMICAL ANALYSES OF SOIL

Bureau Veritas ID		BCH626	BCH630	BCH634		
Sampling Date		2022/08/25	2022/08/27	2022/08/28		
COC Number		1 of 1	1 of 1	1 of 1		
	UNITS	CH22DB198-BNJT(17-32)	CH22DB009-BNT(27-45)	CH22DB048-BNT(20-27)	RDL	QC Batch

Elements						
Cation exchange capacity	cmol+/Kg	20	18	21	10	A731076

RDL = Reportable Detection Limit

Bureau Veritas ID		BCH641		
Sampling Date		2022/08/29		
COC Number		2 of 2		
	UNITS	CH22DBC105-BNT(16-24)	RDL	QC Batch

Elements				
Cation exchange capacity	cmol+/Kg	17	10	A731076

RDL = Reportable Detection Limit

Bureau Veritas - Partial/Rush Results



BUREAU
VERITAS

Bureau Veritas Job #: C272486
Report Date: 2022/10/04

GOLDER ASSOCIATES LTD
Client Project #: 21452763
Site Location: CAPITAL POWER HALKIRK 2
Sampler Initials: DB

MISCELLANEOUS (SOIL)

Bureau Veritas ID		BCH625	BCH628	BCH632		
Sampling Date		2022/08/25	2022/08/27	2022/08/28		
COC Number		1 of 1	1 of 1	1 of 1		
	UNITS	CH22DB198-AH(0-17)	CH22DB009-AP(0-10)	CH22DB048-AP(0-45)	RDL	QC Batch
Misc. Inorganics						
Total Organic Carbon (C)	%	2.8	4.1	3.4	0.050	A740338
RDL = Reportable Detection Limit						

Bureau Veritas - Partial/Rush Results



BUREAU
VERITAS

Bureau Veritas Job #: C272486
Report Date: 2022/10/04

GOLDER ASSOCIATES LTD
Client Project #: 21452763
Site Location: CAPITAL POWER HALKIRK 2
Sampler Initials: DB

GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	18.7°C
-----------	--------

Sample BCH625 [CH22DB198-AH(0-17)] : Sample was analyzed past method specified hold time for pH @25C (1:2 Calcium Chloride Extract). Sample was analyzed past method specified hold time for Chloride (Soluble). Sample was analyzed past method specified hold time for Conductivity @25C (Soluble). Sample was analyzed past method specified hold time for Texture by Hydrometer. Sample was analyzed past method specified hold time for Total Organic Carbon LECO Method.

Sample BCH626 [CH22DB198-BNJT(17-32)] : Sample was analyzed past method specified hold time for pH @25C (1:2 Calcium Chloride Extract). Sample was analyzed past method specified hold time for Conductivity @25C (Soluble). Sample was analyzed past method specified hold time for Chloride (Soluble). SANDY CL LO = SANDY CLAY LOAM Sample was analyzed past method specified hold time for Texture by Hydrometer.

Sample BCH628 [CH22DB009-AP(0-10)] : Sample was analyzed past method specified hold time for Conductivity @25C (Soluble). Sample was analyzed past method specified hold time for pH @25C (1:2 Calcium Chloride Extract). Sample was analyzed past method specified hold time for Chloride (Soluble). Sample was analyzed past method specified hold time for Texture by Hydrometer. Sample was analyzed past method specified hold time for Total Organic Carbon LECO Method.

Sample BCH630 [CH22DB009-BNT(27-45)] : Sample was analyzed past method specified hold time for pH @25C (1:2 Calcium Chloride Extract). Sample was analyzed past method specified hold time for Conductivity @25C (Soluble). Sample was analyzed past method specified hold time for Chloride (Soluble). Sample was analyzed past method specified hold time for Texture by Hydrometer.

Sample BCH632 [CH22DB048-AP(0-45)] : Sample was analyzed past method specified hold time for Total Organic Carbon LECO Method.

Results relate only to the items tested.

Bureau Veritas - Partial/Rush Results



BUREAU
VERITAS

Bureau Veritas Job #: C272486
Report Date: 2022/10/04

GOLDER ASSOCIATES LTD
Client Project #: 21452763
Site Location: CAPITAL POWER HALKIRK 2
Sampler Initials: DB

QUALITY ASSURANCE REPORT

QA/QC									
Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits	
A740338	PL	QC Standard	Total Organic Carbon (C)	2022/10/04		119	%	75 - 125	
A740338	PL	Spiked Blank	Total Organic Carbon (C)	2022/10/04		96	%	80 - 120	
A740338	PL	Method Blank	Total Organic Carbon (C)	2022/10/04	<0.050		%		
A740338	PL	RPD	Total Organic Carbon (C)	2022/10/04	3.3		%	35	

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

Bureau Veritas - Partial/Rush Results



BUREAU
VERITAS

Bureau Veritas Job #: C272486
Report Date: 2022/10/04

GOLDER ASSOCIATES LTD
Client Project #: 21452763
Site Location: CAPITAL POWER HALKIRK 2
Sampler Initials: DB

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:

Ghayasuddin Khan, M.Sc., P.Chem., QP, Scientific Specialist, Inorganics



Bureau Veritas Proprietary Software
Logiciel Propriétaire de Bureau Veritas

Automated Statchk

Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Bureau Veritas - Partial/Rush Results

908



Calgary: 4000 19th St. NE, T2E 6P8. Toll Free (800) 386-7247
 Edmonton: 9331-48 St. T6B 2R4. Toll Free (800) 386-7247
 bvlab.com

CHAIN OF CUSTODY RECORD

Invoice Information		Report Information (if differs from invoice)				Project Information				Turnaround Time (TAT) Required																																												
Company: WSP Golder		Company:				Quotation #:				<input checked="" type="checkbox"/> 5 - 7 Days Regular (Most analyses)																																												
Contact Name: Claire Kisko		Contact Name:				P.O. #/ AFE#:				PLEASE PROVIDE ADVANCE NOTICE FOR RUSH PROJECTS																																												
Address: 106820 107 Ave NW Edmonton, AB, T5P 4C3		Address:				Project #: 21452763				Rush TAT (Surcharges will be applied)																																												
Phone: 587-336-4040		Phone:				Site Location: Capital Power Halkirk 2				<input type="checkbox"/> Same Day <input type="checkbox"/> 2 Days <input type="checkbox"/> 1 Day <input type="checkbox"/> 3-4 Days																																												
Email: claire.kisko@wsp.com		Email:				Site #:				Date Required: _____																																												
Copies: sarah.clark@wsp.com		Copies:				Sampled By: David Brown				Rush Confirmation #: _____																																												
Laboratory Use Only						Analysis Requested										Regulatory Criteria																																						
<table border="1" style="width:100%; border-collapse: collapse;"> <tr><td>Seal Present</td><td>YES</td><td>NO</td><td>Cooler ID</td></tr> <tr><td>Seal Intact</td><td></td><td></td><td>Temp 22 16 18</td></tr> <tr><td>Cooling Media</td><td></td><td></td><td></td></tr> <tr><td>Seal Present</td><td>YES</td><td>NO</td><td>Cooler ID</td></tr> <tr><td>Seal Intact</td><td></td><td></td><td>Temp</td></tr> <tr><td>Cooling Media</td><td></td><td></td><td></td></tr> <tr><td>Seal Present</td><td>YES</td><td>NO</td><td>Cooler ID</td></tr> <tr><td>Seal Intact</td><td></td><td></td><td>Temp</td></tr> <tr><td>Cooling Media</td><td></td><td></td><td></td></tr> </table>		Seal Present	YES	NO	Cooler ID	Seal Intact			Temp 22 16 18	Cooling Media				Seal Present	YES	NO	Cooler ID	Seal Intact			Temp	Cooling Media				Seal Present	YES	NO	Cooler ID	Seal Intact			Temp	Cooling Media				Depot Reception				# of containers <input type="checkbox"/> VOC <input type="checkbox"/> BTEX F1-F2 <input type="checkbox"/> BTEX F1-F4 Routine Water Regulated Metals Tot <input type="checkbox"/> Diss <input type="checkbox"/> Mercury Total <input type="checkbox"/> Dissolved Salinity 4 Sieve (75 micron) Texture (% Sand, Silt, Clay) Basic Class II Landfill CEC - exchangeable Ca/Na TOC											<input type="checkbox"/> AT1 <input checked="" type="checkbox"/> CCME <input type="checkbox"/> Drinking Water <input type="checkbox"/> D50 (Drilling Waste) <input type="checkbox"/> Saskatchewan <input type="checkbox"/> Other:	
Seal Present	YES	NO	Cooler ID																																																			
Seal Intact			Temp 22 16 18																																																			
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Seal Present	YES	NO	Cooler ID																																																			
Seal Intact			Temp																																																			
Cooling Media																																																						
Sample Identification						Depth (Unit)	Date Sampled (YYYY/MM/DD)	Time Sampled (HH:MM)	Matrix											Special Instructions																																		
1	CH22DB198-Ah(0-17)					0-17	2022-08-25	-	soil											X																																		
2	CH22DB198-Bnjt(17-32)					17-32	2022-08-25	-	soil											X																																		
3	CH22DB198-Ck(32-100)					32-100	2022-08-25	-	soil											X																																		
4	CH22DB009-Ap(0-10)					0-10	2022-08-27	-	soil											X																																		
5	CH22DB009-AB(10-27)					10-27	2022-08-27	-	soil											X																																		
6	CH22DB009-Bnt(27-45)					27-45	2022-08-27	-	soil											X																																		
7	CH22DB009-Ck(45-100)					45-100	2022-08-27	-	soil											X																																		
8	CH22DB048-Ap(0-14)					0-14	2022-08-28	-	soil											X																																		
9	CH22DB048-AB(14-20)					14-20	2022-08-28	-	soil											X																																		
10	CH22DB048-Bnt(20-27)					20-27	2022-08-28	-	soil											X																																		
Please indicate Filtered, Preserved or Both (F, P, F/P)																																																						
Relinquished by: (Signature/ Print)			DATE (YYYY/MM/DD)		Time (HH:MM)		Received by: (Signature/ Print)				DATE (YYYY/MM/DD)		Time (HH:MM)		BV Job #																																							
David Brown <i>[Signature]</i>			2022-09-20		12:00		<i>[Signature]</i> JASON BIL				2022/09/20		1515		C272486																																							
Unless otherwise agreed to in writing, work submitted on this Chain of Custody is subject to Bureau Veritas Laboratories' standard Terms and Conditions. Signing of this Chain of Custody document is acknowledgment and acceptance of our terms which are available for viewing at http://www.bvlab.com/terms-and-conditions																																																						



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 Edmonton: 9331-48 St. T6B 2R4. Toll Free (800) 386-7247
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CHAIN OF CUSTODY RECORD

Report Information		Comments				Analysis Requested														Same as CoC	
Company: <u>Golder Associates LTD.</u>						# of containers	BTEX F1 <input type="checkbox"/>	BTEX F1-F2 <input type="checkbox"/>	BTEX F1-F4 <input type="checkbox"/>	Routine Water <input type="checkbox"/>	Regulated Metals Tot. <input type="checkbox"/>	Mercury <input type="checkbox"/>	Salinity 4 <input type="checkbox"/>	Sieve (75 micron) <input type="checkbox"/>	Texture (% Sand, Silt, Clay) <input type="checkbox"/>	Basic Class II Landfill <input type="checkbox"/>	CEC - exchangeable Ca/Na <input type="checkbox"/>	TDC <input type="checkbox"/>	HOLD - DO NOT ANALYZE	Project/LSD	
Contact: <u>Claire Kisko</u>																				Special Instructions	
Phone: _____																					
Email: <u>claire.kisko@wsp.com</u>																					
Sampled by: _____																					
Sample Identification		Depth (Unit)	Date Sampled (YYYY/MM/DD)	Time Sampled (HH:MM)	Matrix																
11	CH22DB048-Ck(27-100)	27-100	2022-08-28		SOIL																X
12	CH22DBC105-Bnt(16-24)	16-24	2022-08-29		SOIL								X	X	X						X
13																					
14																					
15																					
16																					
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Please indicate Filtered, Preserved or Both (F, P, F/P)																					
Relinquished by: (Signature/Print)		DATE (YYYY/MM/DD)	Time (HH:MM)	Received by: (Signature/Print)		DATE (YYYY/MM/DD)	Time (HH:MM)	BV Job #													
David Brown		2022-09-20	12:00	JASON SIV		2022 09 20	1515	C272486													
<small>Unless otherwise agreed to in writing, work submitted on this Chain of Custody is subject to Bureau Veritas Laboratories' standard Terms and Conditions. Signing of this Chain of Custody document is acknowledgment and acceptance of our terms which are available for viewing at http://www.bvlab.com/terms-and-conditions</small>																					



Your Project #: 21452763
 Site Location: CAPITAL POWER HALKIRK 2
 Your C.O.C. #: 1 of 2, 2 of 2

Attention: Claire Kisko

GOLDER ASSOCIATES LTD
 16820-107 AVE
 EDMONTON, AB
 CANADA T5P 4C3

Report Date: 2022/10/26
 Report #: R3254413
 Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C280078

Received: 2022/10/13, 10:00

Sample Matrix: Soil
 # Samples Received: 28

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Cation/EC Ratio	4	N/A	2022/10/21		Auto Calc
Cation/EC Ratio	4	N/A	2022/10/22		Auto Calc
Cation/EC Ratio	20	N/A	2022/10/23		Auto Calc
Cation Exchange Capacity (1) Chloride (Soluble)	9	2022/10/17	2022/10/23		Auto Calc
	28	2022/10/20	2022/10/21	AB SOP-00033 / AB SOP-00020	SM 23-4500-Cl-E m
Conductivity @25C (Soluble)	4	2022/10/20	2022/10/21	AB SOP-00033 / AB SOP-00004	SM 23 2510 B m
Conductivity @25C (Soluble)	4	2022/10/20	2022/10/22	AB SOP-00033 / AB SOP-00004	SM 23 2510 B m
Conductivity @25C (Soluble)	20	2022/10/21	2022/10/22	AB SOP-00033 / AB SOP-00004	SM 23 2510 B m
Sum of Cations, Anions	8	N/A	2022/10/21		Auto Calc
Sum of Cations, Anions	20	N/A	2022/10/23		Auto Calc
pH @25C (1:2 Calcium Chloride Extract)	28	2022/10/20	2022/10/20	AB SOP-00033 / AB SOP-00006	SM 23 4500 H+B m
Sodium Adsorption Ratio	8	N/A	2022/10/21		Auto Calc
Sodium Adsorption Ratio	20	N/A	2022/10/23		Auto Calc
Soluble Ions	16	2022/10/20	2022/10/21	AB SOP-00033 / AB SOP-00042	EPA 6010d R5 m
Soluble Ions	12	2022/10/20	2022/10/23	AB SOP-00033 / AB SOP-00042	EPA 6010d R5 m
Soluble Paste	28	2022/10/20	2022/10/20	AB SOP-00033	Carter 2nd ed 15.2 m
Soluble Ions Calculation	4	N/A	2022/10/20		Auto Calc
Soluble Ions Calculation	24	N/A	2022/10/21		Auto Calc
Total Organic Carbon LECO Method	3	N/A	2022/10/20	CAL SOP-00243	LECO 203-821-498 m
Total Organic Carbon LECO Method	6	N/A	2022/10/21	CAL SOP-00243	LECO 203-821-498 m
Texture by Hydrometer	22	N/A	2022/10/21	AB SOP-00030	Carter 2nd ed 55.3 m
Texture by Hydrometer	6	N/A	2022/10/22	AB SOP-00030	Carter 2nd ed 55.3 m
Texture Class	22	N/A	2022/10/21		Auto Calc
Texture Class	6	N/A	2022/10/22		Auto Calc
Theoretical Gypsum Requirement (2)	8	N/A	2022/10/21		Auto Calc
Theoretical Gypsum Requirement (2)	20	N/A	2022/10/23		Auto Calc



Your Project #: 21452763
 Site Location: CAPITAL POWER HALKIRK 2
 Your C.O.C. #: 1 of 2, 2 of 2

Attention: Claire Kisko
 GOLDER ASSOCIATES LTD
 16820-107 AVE
 EDMONTON, AB
 CANADA T5P 4C3

Report Date: 2022/10/26
 Report #: R3254413
 Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C280078

Received: 2022/10/13, 10:00

Sample Matrix: Soil
 # Samples Received: 28

Analyses	Date Quantity Extracted	Date Analyzed	Laboratory Method	Analytical Method
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Remarks:
 Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, MELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.

Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested. This Certificate shall not be reproduced except in full, without the written approval of the laboratory.

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

(1) Sample(s) analyzed using accredited methodologies and have been subjected to Bureau Veritas's standard validation process for the submitted matrix however this is not accredited for this matrix.

(2) TGR calculation is based on a theoretical SAR of 4. Salt Contamination and Assessment and remediation guideline 2001 recommended SAR is ranging 4-8. TGR is reported in tonnes/ha.



Your Project #: 21452763
Site Location: CAPITAL POWER HALKIRK 2
Your C.O.C. #: 1 of 2, 2 of 2

Attention: Claire Kisko
GOLDER ASSOCIATES LTD
16820-107 AVE
EDMONTON, AB
CANADA T5P 4C3

Report Date: 2022/10/26
Report #: R3254413
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C280078

Received: 2022/10/13, 10:00

Encryption Key



**AUTHORIZED REPORT
RAPPORT AUTORISÉ**

Bureau Veritas
26 Oct 2022 13:45:53

Please direct all questions regarding this Certificate of Analysis to:
Cynny Hagen, Key Account Specialist
Email: Cynny.HAGEN@bureauveritas.com
Phone# (403)735-2273

=====
This report has been generated and distributed using a secure automated process.
Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports.
For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by Scott Cantwell, General Manager responsible for Alberta Environmental laboratory operations.



BUREAU
VERITAS

Bureau Veritas Job #: C280078
Report Date: 2022/10/26

GOLDER ASSOCIATES LTD
Client Project #: 21452763
Site Location: CAPITAL POWER HALKIRK 2
Sampler Initials: DB

RESULTS OF CHEMICAL ANALYSES OF SOIL

Bureau Veritas ID		BEI303			BEI304		
Sampling Date		2022/08/28			2022/08/28		
COC Number		1 of 2			1 of 2		
	UNITS	CH22DB027-AP 0-20	RDL	QC Batch	CH22DB027-AE 20-25	RDL	QC Batch
Calculated Parameters							
Anion Sum	meq/L	1.3	N/A	A759515	0.57	N/A	A759515
Cation Sum	meq/L	2.5	N/A	A759515	1.9	N/A	A759515
Cation/EC Ratio	N/A	11	0.10	A759508	12	0.10	A759508
Calculated Calcium (Ca)	mg/kg	8.2	0.82	A760170	3.3	0.73	A760170
Calculated Magnesium (Mg)	mg/kg	2.2	0.55	A760170	1.4	0.48	A760170
Calculated Sodium (Na)	mg/kg	9.0	1.4	A760170	14	1.2	A760170
Calculated Potassium (K)	mg/kg	13	0.71	A760170	1.9	0.63	A760170
Calculated Chloride (Cl)	mg/kg	6.0	5.5	A760170	<4.8	4.8	A760170
Calculated Sulphate (SO4)	mg/kg	26	2.7	A760170	13	2.4	A760170
Soluble Parameters							
Soluble Chloride (Cl)	mg/L	11	10	A767198	<10	10	A766342
Soluble Conductivity	dS/m	0.23	0.020	A768297	0.16	0.020	A766641
Soluble (CaCl2) pH	pH	4.32	N/A	A764532	4.75	N/A	A763400
Sodium Adsorption Ratio	N/A	0.98	0.10	A760169	2.3	0.10	A760169
Soluble Calcium (Ca)	mg/L	15	1.5	A766820	6.9	1.5	A766254
Soluble Magnesium (Mg)	mg/L	3.9	1.0	A766820	2.9	1.0	A766254
Soluble Sodium (Na)	mg/L	17	2.5	A766820	28	2.5	A766254
Soluble Potassium (K)	mg/L	24	1.3	A766820	3.9	1.3	A766254
Saturation %	%	55	N/A	A764527	48	N/A	A763397
Soluble Sulphate (SO4)	mg/L	48	5.0	A766820	27	5.0	A766254
Theoretical Gypsum Requirement	tonnes/ha	<0.20	0.20	A759523	<0.20	0.20	A759523
RDL = Reportable Detection Limit N/A = Not Applicable							



BUREAU
VERITAS

Bureau Veritas Job #: C280078
Report Date: 2022/10/26

GOLDER ASSOCIATES LTD
Client Project #: 21452763
Site Location: CAPITAL POWER HALKIRK 2
Sampler Initials: DB

RESULTS OF CHEMICAL ANALYSES OF SOIL

Bureau Veritas ID		BEI305			BEI306		
Sampling Date		2022/08/28			2022/08/28		
COC Number		1 of 2			1 of 2		
	UNITS	CH22DB027-BNT 25-43	RDL	QC Batch	CH22DB027-CK 43-100	RDL	QC Batch
Calculated Parameters							
Anion Sum	meq/L	0.58	N/A	A759515	1.6	N/A	A759515
Cation Sum	meq/L	1.6	N/A	A759515	2.5	N/A	A759515
Cation/EC Ratio	N/A	11	0.10	A759508	10	0.10	A759508
Calculated Calcium (Ca)	mg/kg	4.0	0.74	A760170	3.0	0.60	A760170
Calculated Magnesium (Mg)	mg/kg	1.2	0.49	A760170	0.84	0.40	A760170
Calculated Sodium (Na)	mg/kg	9.9	1.2	A760170	18	1.0	A760170
Calculated Potassium (K)	mg/kg	1.2	0.64	A760170	0.76	0.52	A760170
Calculated Chloride (Cl)	mg/kg	<4.9	4.9	A760170	6.7	4.0	A760170
Calculated Sulphate (SO4)	mg/kg	14	2.5	A760170	21	2.0	A760170
Elements							
Cation exchange capacity	cmol+/Kg	14	10	A760744			
Soluble Parameters							
Soluble Chloride (Cl)	mg/L	<10	10	A767198	17	10	A766342
Soluble Conductivity	dS/m	0.14	0.020	A768297	0.24	0.020	A766641
Soluble (CaCl2) pH	pH	4.99	N/A	A764532	6.28	N/A	A763400
Sodium Adsorption Ratio	N/A	1.6	0.10	A760169	3.7	0.10	A760169
Soluble Calcium (Ca)	mg/L	8.1	1.5	A766820	7.4	1.5	A766254
Soluble Magnesium (Mg)	mg/L	2.5	1.0	A766820	2.1	1.0	A766254
Soluble Sodium (Na)	mg/L	20	2.5	A766820	44	2.5	A766254
Soluble Potassium (K)	mg/L	2.4	1.3	A766820	1.9	1.3	A766254
Saturation %	%	49	N/A	A764527	40	N/A	A763397
Soluble Sulphate (SO4)	mg/L	28	5.0	A766820	53	5.0	A766254
Theoretical Gypsum Requirement	tonnes/ha	<0.20	0.20	A759523	<0.20	0.20	A759523
RDL = Reportable Detection Limit N/A = Not Applicable							



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RESULTS OF CHEMICAL ANALYSES OF SOIL

Bureau Veritas ID		BEI307			BEI308		
Sampling Date		2022/10/03			2022/10/03		
COC Number		1 of 2			1 of 2		
	UNITS	CH22SB087-AP 0-13	RDL	QC Batch	CH22SB087-BNT 13-37	RDL	QC Batch
Calculated Parameters							
Anion Sum	meq/L	3.0	N/A	A759515	3.4	N/A	A759515
Cation Sum	meq/L	4.0	N/A	A759515	5.3	N/A	A759515
Cation/EC Ratio	N/A	10	0.10	A759508	11	0.10	A759508
Calculated Calcium (Ca)	mg/kg	6.1	0.69	A760170	5.3	0.70	A760170
Calculated Magnesium (Mg)	mg/kg	1.7	0.46	A760170	1.8	0.47	A760170
Calculated Sodium (Na)	mg/kg	29	1.2	A760170	47	1.2	A760170
Calculated Potassium (K)	mg/kg	5.0	0.60	A760170	1.3	0.61	A760170
Calculated Chloride (Cl)	mg/kg	8.8	4.6	A760170	10	4.7	A760170
Calculated Sulphate (SO4)	mg/kg	54	2.3	A760170	62	2.3	A760170
Elements							
Cation exchange capacity	cmol+/Kg				16	10	A760744
Soluble Parameters							
Soluble Chloride (Cl)	mg/L	19	10	A767198	22	10	A767082
Soluble Conductivity	dS/m	0.39	0.020	A768297	0.46	0.020	A767888
Soluble (CaCl2) pH	pH	4.73	N/A	A764532	5.91	N/A	A763357
Sodium Adsorption Ratio	N/A	4.0	0.10	A760169	6.6	0.10	A760169
Soluble Calcium (Ca)	mg/L	13	1.5	A766820	11	1.5	A767414
Soluble Magnesium (Mg)	mg/L	3.8	1.0	A766820	3.8	1.0	A767414
Soluble Sodium (Na)	mg/L	63	2.5	A766820	100	2.5	A767414
Soluble Potassium (K)	mg/L	11	1.3	A766820	2.9	1.3	A767414
Saturation %	%	46	N/A	A764527	47	N/A	A763353
Soluble Sulphate (SO4)	mg/L	120	5.0	A766820	130	5.0	A767414
Theoretical Gypsum Requirement	tonnes/ha	<0.20	0.20	A759523	<0.20	0.20	A759523
RDL = Reportable Detection Limit N/A = Not Applicable							



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RESULTS OF CHEMICAL ANALYSES OF SOIL

Bureau Veritas ID		BEI309		BEI310		
Sampling Date		2022/10/03		2022/10/03		
COC Number		1 of 2		1 of 2		
	UNITS	CH22SB087-CK 37-100	RDL	CH22SB096-AP 0-13	RDL	QC Batch
Calculated Parameters						
Anion Sum	meq/L	87	N/A	2.2	N/A	A759515
Cation Sum	meq/L	86	N/A	3.2	N/A	A759515
Cation/EC Ratio	N/A	12	0.10	9.9	0.10	A759508
Calculated Calcium (Ca)	mg/kg	230	0.81	7.1	0.71	A760170
Calculated Magnesium (Mg)	mg/kg	130	0.54	3.5	0.47	A760170
Calculated Sodium (Na)	mg/kg	550	1.3	17	1.2	A760170
Calculated Potassium (K)	mg/kg	13	0.70	4.9	0.61	A760170
Calculated Chloride (Cl)	mg/kg	<5.4	5.4	<4.7	4.7	A760170
Calculated Sulphate (SO4)	mg/kg	2200	2.7	50	2.4	A760170
Soluble Parameters						
Soluble Chloride (Cl)	mg/L	<10	10	<10	10	A767082
Soluble Conductivity	dS/m	7.0	0.020	0.33	0.020	A767888
Soluble (CaCl2) pH	pH	7.70	N/A	4.41	N/A	A763357
Sodium Adsorption Ratio	N/A	9.9	0.10	1.9	0.10	A760169
Soluble Calcium (Ca)	mg/L	430	1.5	15	1.5	A767414
Soluble Magnesium (Mg)	mg/L	240	1.0	7.5	1.0	A767414
Soluble Sodium (Na)	mg/L	1000	2.5	36	2.5	A767414
Soluble Potassium (K)	mg/L	24	1.3	10	1.3	A767414
Saturation %	%	54	N/A	47	N/A	A763353
Soluble Sulphate (SO4)	mg/L	4200	5.0	110	5.0	A767414
Theoretical Gypsum Requirement	tonnes/ha	19	0.20	<0.20	0.20	A759523
RDL = Reportable Detection Limit N/A = Not Applicable						



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RESULTS OF CHEMICAL ANALYSES OF SOIL

Bureau Veritas ID		BEI311			BEI312		
Sampling Date		2022/10/03			2022/10/03		
COC Number		1 of 2			1 of 2		
	UNITS	CH22SB096-BNT 13-30	RDL	QC Batch	CH22SB096-CK 30-100	RDL	QC Batch
Calculated Parameters							
Anion Sum	meq/L	1.5	N/A	A759515	14	N/A	A759515
Cation Sum	meq/L	2.1	N/A	A759515	17	N/A	A759515
Cation/EC Ratio	N/A	10	0.10	A759508	10	0.10	A759508
Calculated Calcium (Ca)	mg/kg	3.8	0.62	A760170	47	0.69	A760170
Calculated Magnesium (Mg)	mg/kg	2.1	0.41	A760170	19	0.46	A760170
Calculated Sodium (Na)	mg/kg	11	1.0	A760170	83	1.1	A760170
Calculated Potassium (K)	mg/kg	0.87	0.54	A760170	3.3	0.59	A760170
Calculated Chloride (Cl)	mg/kg	<4.1	4.1	A760170	<4.6	4.6	A760170
Calculated Sulphate (SO4)	mg/kg	30	2.1	A760170	310	2.3	A760170
Elements							
Cation exchange capacity	cmol+/Kg	13	10	A760744			
Soluble Parameters							
Soluble Chloride (Cl)	mg/L	<10	10	A767082	<10	10	A767082
Soluble Conductivity	dS/m	0.20	0.020	A767888	1.7	0.020	A767888
Soluble (CaCl2) pH	pH	5.10	N/A	A763357	7.63	N/A	A763357
Sodium Adsorption Ratio	N/A	1.7	0.10	A760169	3.8	0.10	A760169
Soluble Calcium (Ca)	mg/L	9.3	1.5	A767414	100	1.5	A767414
Soluble Magnesium (Mg)	mg/L	5.1	1.0	A767414	41	1.0	A767414
Soluble Sodium (Na)	mg/L	26	2.5	A767414	180	2.5	A767414
Soluble Potassium (K)	mg/L	2.1	1.3	A767414	7.3	1.3	A767414
Saturation %	%	41	N/A	A763353	46	N/A	A763353
Soluble Sulphate (SO4)	mg/L	72	5.0	A767414	680	5.0	A767414
Theoretical Gypsum Requirement	tonnes/ha	<0.20	0.20	A759523	<0.20	0.20	A759523
RDL = Reportable Detection Limit N/A = Not Applicable							



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RESULTS OF CHEMICAL ANALYSES OF SOIL

Bureau Veritas ID		BEI342		BEI343		
Sampling Date		2022/10/04		2022/10/04		
COC Number		2 of 2		2 of 2		
	UNITS	CH22SB015-AH 0-12	RDL	CH22SB015-AB 12-30	RDL	QC Batch
Calculated Parameters						
Anion Sum	meq/L	6.2	N/A	4.1	N/A	A759515
Cation Sum	meq/L	7.9	N/A	6.0	N/A	A759515
Cation/EC Ratio	N/A	11	0.10	11	0.10	A759508
Calculated Calcium (Ca)	mg/kg	23	1.1	3.6	0.60	A760170
Calculated Magnesium (Mg)	mg/kg	9.8	0.76	1.0	0.40	A760170
Calculated Sodium (Na)	mg/kg	90	1.9	49	1.0	A760170
Calculated Potassium (K)	mg/kg	2.0	0.98	1.0	0.52	A760170
Calculated Chloride (Cl)	mg/kg	10	7.6	7.5	4.0	A760170
Calculated Sulphate (SO4)	mg/kg	210	3.8	68	2.0	A760170
Soluble Parameters						
Soluble Chloride (Cl)	mg/L	14	10	19	10	A767082
Soluble Conductivity	dS/m	0.74	0.020	0.54	0.020	A767888
Soluble (CaCl2) pH	pH	4.36 (1)	N/A	5.29	N/A	A763357
Sodium Adsorption Ratio	N/A	4.6	0.10	9.2	0.10	A760169
Soluble Calcium (Ca)	mg/L	30	1.5	9.0	1.5	A767414
Soluble Magnesium (Mg)	mg/L	13	1.0	2.5	1.0	A767414
Soluble Sodium (Na)	mg/L	120	2.5	120	2.5	A767414
Soluble Potassium (K)	mg/L	2.6	1.3	2.5	1.3	A767414
Saturation %	%	76	N/A	40	N/A	A763353
Soluble Sulphate (SO4)	mg/L	280	5.0	170	5.0	A767414
Theoretical Gypsum Requirement	tonnes/ha	<0.20	0.20	<0.20	0.20	A759523
RDL = Reportable Detection Limit N/A = Not Applicable (1) pH was done on a 10:1 Calcium Chloride to soil ratio due to the matrix of the sample.						



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RESULTS OF CHEMICAL ANALYSES OF SOIL

Bureau Veritas ID		BEI344			BEI345		
Sampling Date		2022/10/04			2022/10/04		
COC Number		2 of 2			2 of 2		
	UNITS	CH22SB015-BNT 30-49	RDL	QC Batch	CH22SB015-CK 49-100	RDL	QC Batch
Calculated Parameters							
Anion Sum	meq/L	69	N/A	A759515	250	N/A	A759515
Cation Sum	meq/L	69	N/A	A759515	240	N/A	A759515
Cation/EC Ratio	N/A	10	0.10	A759508	14	0.10	A759508
Calculated Calcium (Ca)	mg/kg	13	0.68	A760170	250	0.90	A760170
Calculated Magnesium (Mg)	mg/kg	15	0.45	A760170	280	0.60	A760170
Calculated Sodium (Na)	mg/kg	670	1.1	A760170	2400	1.5	A760170
Calculated Potassium (K)	mg/kg	5.5	0.59	A760170	19	0.78	A760170
Calculated Chloride (Cl)	mg/kg	12	4.5	A760170	8.0	6.0	A760170
Calculated Sulphate (SO4)	mg/kg	1500	2.3	A760170	7100	3.0	A760170
Elements							
Cation exchange capacity	cmol+/Kg	16	10	A760744			
Soluble Parameters							
Soluble Chloride (Cl)	mg/L	27	10	A767082	13	10	A766342
Soluble Conductivity	dS/m	6.6	0.020	A767888	17	0.020	A766641
Soluble (CaCl2) pH	pH	7.80	N/A	A763357	8.48	N/A	A763400
Sodium Adsorption Ratio	N/A	45	0.10	A760169	33	0.10	A760169
Soluble Calcium (Ca)	mg/L	29	1.5	A767414	410	1.5	A766254
Soluble Magnesium (Mg)	mg/L	32	1.0	A767414	470	1.0	A766254
Soluble Sodium (Na)	mg/L	1500	2.5	A767414	4100	2.5	A766254
Soluble Potassium (K)	mg/L	12	1.3	A767414	31	1.3	A766254
Saturation %	%	45	N/A	A763353	60	N/A	A763397
Soluble Sulphate (SO4)	mg/L	3300	5.0	A767414	12000	5.0	A766254
Theoretical Gypsum Requirement	tonnes/ha	39	0.20	A759523	390	0.20	A759523
RDL = Reportable Detection Limit N/A = Not Applicable							



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RESULTS OF CHEMICAL ANALYSES OF SOIL

Bureau Veritas ID		BEI346			BEI347		
Sampling Date		2022/10/04			2022/10/04		
COC Number		2 of 2			2 of 2		
	UNITS	CH22SB031-AP 0-10	RDL	QC Batch	CH22SB031-BNT 10-26	RDL	QC Batch
Calculated Parameters							
Anion Sum	meq/L	7.2	N/A	A759515	58	N/A	A759515
Cation Sum	meq/L	8.3	N/A	A759515	56	N/A	A759515
Cation/EC Ratio	N/A	9.6	0.10	A759508	10	0.10	A759508
Calculated Calcium (Ca)	mg/kg	5.5	0.73	A760170	31	0.74	A760170
Calculated Magnesium (Mg)	mg/kg	3.3	0.49	A760170	56	0.49	A760170
Calculated Sodium (Na)	mg/kg	79	1.2	A760170	490	1.2	A760170
Calculated Potassium (K)	mg/kg	2.5	0.63	A760170	3.0	0.64	A760170
Calculated Chloride (Cl)	mg/kg	18	4.9	A760170	5.5	4.9	A760170
Calculated Sulphate (SO4)	mg/kg	140	2.4	A760170	1300	2.5	A760170
Elements							
Cation exchange capacity	cmol+/Kg				25	10	A760744
Soluble Parameters							
Soluble Chloride (Cl)	mg/L	36	10	A767198	11	10	A767082
Soluble Conductivity	dS/m	0.86	0.020	A768297	5.4	0.020	A767888
Soluble (CaCl2) pH	pH	4.77	N/A	A764532	7.87	N/A	A763357
Sodium Adsorption Ratio	N/A	9.4	0.10	A760169	17	0.10	A760169
Soluble Calcium (Ca)	mg/L	11	1.5	A766820	63	1.5	A767414
Soluble Magnesium (Mg)	mg/L	6.8	1.0	A766820	110	1.0	A767414
Soluble Sodium (Na)	mg/L	160	2.5	A766820	1000	2.5	A767414
Soluble Potassium (K)	mg/L	5.1	1.3	A766820	6.1	1.3	A767414
Saturation %	%	49	N/A	A764527	49	N/A	A763353
Soluble Sulphate (SO4)	mg/L	300	5.0	A766820	2800	5.0	A767414
Theoretical Gypsum Requirement	tonnes/ha	0.41	0.20	A759523	18	0.20	A759523
RDL = Reportable Detection Limit N/A = Not Applicable							



RESULTS OF CHEMICAL ANALYSES OF SOIL

Bureau Veritas ID		BEI348		BEI349		
Sampling Date		2022/10/04		2022/10/06		
COC Number		2 of 2		2 of 2		
	UNITS	CH22SB031-CK 26-100	RDL	CH22SB187-AP 0-11	RDL	QC Batch
Calculated Parameters						
Anion Sum	meq/L	170	N/A	9.4	N/A	A759515
Cation Sum	meq/L	170	N/A	10	N/A	A759515
Cation/EC Ratio	N/A	13	0.10	8.6	0.10	A759508
Calculated Calcium (Ca)	mg/kg	220	0.78	7.1	0.63	A760170
Calculated Magnesium (Mg)	mg/kg	320	0.52	3.7	0.42	A760170
Calculated Sodium (Na)	mg/kg	1100	1.3	81	1.1	A760170
Calculated Potassium (K)	mg/kg	11	0.67	4.7	0.55	A760170
Calculated Chloride (Cl)	mg/kg	31	5.2	5.8	4.2	A760170
Calculated Sulphate (SO4)	mg/kg	4200	2.6	180	2.1	A760170
Soluble Parameters						
Soluble Chloride (Cl)	mg/L	60	10	14	10	A767082
Soluble Conductivity	dS/m	12	0.020	1.2	0.020	A767888
Soluble (CaCl2) pH	pH	8.20	N/A	4.61	N/A	A763357
Sodium Adsorption Ratio	N/A	16	0.10	9.4	0.10	A760169
Soluble Calcium (Ca)	mg/L	430	1.5	17	1.5	A767414
Soluble Magnesium (Mg)	mg/L	610	1.0	8.8	1.0	A767414
Soluble Sodium (Na)	mg/L	2200	2.5	190	2.5	A767414
Soluble Potassium (K)	mg/L	21	1.3	11	1.3	A767414
Saturation %	%	52	N/A	42	N/A	A763353
Soluble Sulphate (SO4)	mg/L	8200	5.0	430	5.0	A767414
Theoretical Gypsum Requirement	tonnes/ha	90	0.20	0.50	0.20	A759523
RDL = Reportable Detection Limit N/A = Not Applicable						



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RESULTS OF CHEMICAL ANALYSES OF SOIL

Bureau Veritas ID		BEI350			BEI351		
Sampling Date		2022/10/06			2022/10/06		
COC Number		2 of 2			2 of 2		
	UNITS	CH22SB187-BNT 11-30	RDL	QC Batch	CH22SB187-CK 30-100	RDL	QC Batch
Calculated Parameters							
Anion Sum	meq/L	59	N/A	A759515	210	N/A	A759515
Cation Sum	meq/L	62	N/A	A759515	180	N/A	A759515
Cation/EC Ratio	N/A	11	0.10	A759508	13	0.10	A759508
Calculated Calcium (Ca)	mg/kg	27	0.76	A760170	270	0.92	A760170
Calculated Magnesium (Mg)	mg/kg	30	0.51	A760170	280	0.61	A760170
Calculated Sodium (Na)	mg/kg	640	1.3	A760170	1700	1.5	A760170
Calculated Potassium (K)	mg/kg	3.8	0.66	A760170	16	0.80	A760170
Calculated Chloride (Cl)	mg/kg	14	5.1	A760170	<6.1	6.1	A760170
Calculated Sulphate (SO4)	mg/kg	1400	2.5	A760170	6200	3.1	A760170
Elements							
Cation exchange capacity	cmol+/Kg	22	10	A760744			
Soluble Parameters							
Soluble Chloride (Cl)	mg/L	27	10	A767082	<10	10	A767082
Soluble Conductivity	dS/m	5.6	0.020	A767888	14	0.020	A767888
Soluble (CaCl2) pH	pH	7.86	N/A	A763357	8.23	N/A	A763357
Sodium Adsorption Ratio	N/A	28	0.10	A760169	22	0.10	A760169
Soluble Calcium (Ca)	mg/L	52	1.5	A767414	450	1.5	A767414
Soluble Magnesium (Mg)	mg/L	59	1.0	A767414	450	1.0	A767414
Soluble Sodium (Na)	mg/L	1300	2.5	A767414	2800	2.5	A767414
Soluble Potassium (K)	mg/L	7.4	1.3	A767414	27	1.3	A767414
Saturation %	%	51	N/A	A763353	61	N/A	A763353
Soluble Sulphate (SO4)	mg/L	2800	5.0	A767414	10000	5.0	A767414
Theoretical Gypsum Requirement	tonnes/ha	31	0.20	A759523	180	0.20	A759523
RDL = Reportable Detection Limit N/A = Not Applicable							



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Bureau Veritas ID		BEI352			BEI353		
Sampling Date		2022/10/06			2022/10/06		
COC Number		2 of 2			2 of 2		
	UNITS	CH22SB104-AP0-16	RDL	QC Batch	CH22S104-BNT 16-34	RDL	QC Batch
Calculated Parameters							
Anion Sum	meq/L	2.8	N/A	A759515	4.3	N/A	A760746
Cation Sum	meq/L	5.4	N/A	A759515	7.2	N/A	A760746
Cation/EC Ratio	N/A	9.5	0.10	A760743	12	0.10	A760743
Calculated Calcium (Ca)	mg/kg	12	0.81	A760170	5.3	0.63	A760170
Calculated Magnesium (Mg)	mg/kg	4.8	0.54	A760170	2.5	0.42	A760170
Calculated Sodium (Na)	mg/kg	41	1.3	A760170	58	1.0	A760170
Calculated Potassium (K)	mg/kg	2.4	0.70	A760170	0.67	0.54	A760170
Calculated Chloride (Cl)	mg/kg	<5.4	5.4	A760170	10	4.2	A760170
Calculated Sulphate (SO4)	mg/kg	71	2.7	A760170	72	2.1	A760170
Elements							
Cation exchange capacity	cmol+/Kg				21	10	A760744
Soluble Parameters							
Soluble Chloride (Cl)	mg/L	<10	10	A767082	25	10	A767082
Soluble Conductivity	dS/m	0.57	0.020	A767888	0.62	0.020	A767888
Soluble (CaCl2) pH	pH	4.14	N/A	A763357	6.80	N/A	A763357
Sodium Adsorption Ratio	N/A	3.5	0.10	A760169	8.0	0.10	A760169
Soluble Calcium (Ca)	mg/L	22	1.5	A767414	13	1.5	A767414
Soluble Magnesium (Mg)	mg/L	9.0	1.0	A767414	6.1	1.0	A767414
Soluble Sodium (Na)	mg/L	77	2.5	A767414	140	2.5	A767414
Soluble Potassium (K)	mg/L	4.4	1.3	A767414	1.6	1.3	A767414
Saturation %	%	54	N/A	A763353	42	N/A	A763353
Soluble Sulphate (SO4)	mg/L	130	5.0	A767414	170	5.0	A767414
Theoretical Gypsum Requirement	tonnes/ha	<0.20	0.20	A759523	0.23	0.20	A760752
RDL = Reportable Detection Limit N/A = Not Applicable							



RESULTS OF CHEMICAL ANALYSES OF SOIL

Bureau Veritas ID		BEI354			BEI355		
Sampling Date		2022/10/06			2022/10/07		
COC Number		2 of 2			2 of 2		
	UNITS	CH22SB104-CK 34-100	RDL	QC Batch	CH22DB076-AP 0-13	RDL	QC Batch
Calculated Parameters							
Anion Sum	meq/L	140	N/A	A760746	1.6	N/A	A760746
Cation Sum	meq/L	130	N/A	A760746	3.1	N/A	A760746
Cation/EC Ratio	N/A	13	0.10	A760743	10	0.10	A760743
Calculated Calcium (Ca)	mg/kg	250	0.88	A760170	5.0	0.84	A760750
Calculated Magnesium (Mg)	mg/kg	310	0.59	A760170	1.6	0.56	A760750
Calculated Sodium (Na)	mg/kg	900	1.5	A760170	28	1.4	A760750
Calculated Potassium (K)	mg/kg	10	0.76	A760170	5.2	0.73	A760750
Calculated Chloride (Cl)	mg/kg	8.4	5.9	A760170	<5.6	5.6	A760750
Calculated Sulphate (SO4)	mg/kg	4000	2.9	A760170	43	2.8	A760750
Soluble Parameters							
Soluble Chloride (Cl)	mg/L	14	10	A767082	<10	10	A766342
Soluble Conductivity	dS/m	10	0.020	A767888	0.31	0.020	A766641
Soluble (CaCl2) pH	pH	7.54	N/A	A763357	4.50	N/A	A763400
Sodium Adsorption Ratio	N/A	12	0.10	A760169	3.7	0.10	A760169
Soluble Calcium (Ca)	mg/L	430	1.5	A767414	8.9	1.5	A766254
Soluble Magnesium (Mg)	mg/L	530	1.0	A767414	2.8	1.0	A766254
Soluble Sodium (Na)	mg/L	1500	2.5	A767414	50	2.5	A766254
Soluble Potassium (K)	mg/L	17	1.3	A767414	9.3	1.3	A766254
Saturation %	%	59	N/A	A763353	56	N/A	A763397
Soluble Sulphate (SO4)	mg/L	6800	5.0	A767414	76	5.0	A766254
Theoretical Gypsum Requirement	tonnes/ha	48	0.20	A760752	<0.20	0.20	A760752
RDL = Reportable Detection Limit N/A = Not Applicable							



BUREAU
VERITAS

Bureau Veritas Job #: C280078
Report Date: 2022/10/26

GOLDER ASSOCIATES LTD
Client Project #: 21452763
Site Location: CAPITAL POWER HALKIRK 2
Sampler Initials: DB

RESULTS OF CHEMICAL ANALYSES OF SOIL

Bureau Veritas ID		BEI356			BEI357		
Sampling Date		2022/10/07			2022/10/07		
COC Number		2 of 2			2 of 2		
	UNITS	CH22DB076-AB 13-20	RDL	QC Batch	CH22DB076-BNT 20-31	RDL	QC Batch
Calculated Parameters							
Anion Sum	meq/L	5.0	N/A	A760746	23	N/A	A760746
Cation Sum	meq/L	7.5	N/A	A760746	24	N/A	A760746
Cation/EC Ratio	N/A	9.1	0.10	A760743	9.7	0.10	A760743
Calculated Calcium (Ca)	mg/kg	6.1	0.67	A760750	11	0.76	A760750
Calculated Magnesium (Mg)	mg/kg	2.9	0.45	A760750	7.6	0.51	A760750
Calculated Sodium (Na)	mg/kg	64	1.1	A760750	250	1.3	A760750
Calculated Potassium (K)	mg/kg	1.2	0.58	A760750	2.9	0.66	A760750
Calculated Chloride (Cl)	mg/kg	5.6	4.5	A760750	14	5.1	A760750
Calculated Sulphate (SO4)	mg/kg	100	2.2	A760750	540	2.5	A760750
Elements							
Cation exchange capacity	cmol+/Kg				25	10	A760744
Soluble Parameters							
Soluble Chloride (Cl)	mg/L	12	10	A767082	27	10	A767082
Soluble Conductivity	dS/m	0.82	0.020	A767888	2.5	0.020	A767888
Soluble (CaCl2) pH	pH	6.21 (1)	N/A	A763357	7.09	N/A	A763357
Sodium Adsorption Ratio	N/A	8.0	0.10	A760749	20	0.10	A760749
Soluble Calcium (Ca)	mg/L	14	1.5	A767414	21	1.5	A767414
Soluble Magnesium (Mg)	mg/L	6.4	1.0	A767414	15	1.0	A767414
Soluble Sodium (Na)	mg/L	140	2.5	A767414	490	2.5	A767414
Soluble Potassium (K)	mg/L	2.8	1.3	A767414	5.8	1.3	A767414
Saturation %	%	45	N/A	A763353	51	N/A	A763353
Soluble Sulphate (SO4)	mg/L	220	5.0	A767414	1100	5.0	A767414
Theoretical Gypsum Requirement	tonnes/ha	0.27	0.20	A760752	4.6	0.20	A760752
RDL = Reportable Detection Limit N/A = Not Applicable (1) pH was done on a 10:1 Calcium Chloride to soil ratio due to the matrix of the sample.							



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VERITAS

Bureau Veritas Job #: C280078
Report Date: 2022/10/26

GOLDER ASSOCIATES LTD
Client Project #: 21452763
Site Location: CAPITAL POWER HALKIRK 2
Sampler Initials: DB

RESULTS OF CHEMICAL ANALYSES OF SOIL

Bureau Veritas ID		BEI358			BEI359		
Sampling Date		2022/10/07			2022/10/08		
COC Number		2 of 2			2 of 2		
	UNITS	CH22DB076-CK 31-100	RDL	QC Batch	CH22SB097-BNT 31-45	RDL	QC Batch
Calculated Parameters							
Anion Sum	meq/L	150	N/A	A760746	1.5	N/A	A760746
Cation Sum	meq/L	160	N/A	A760746	2.1	N/A	A760746
Cation/EC Ratio	N/A	14	0.10	A760743	9.6	0.10	A760743
Calculated Calcium (Ca)	mg/kg	370	1.0	A760750	6.6	0.64	A760750
Calculated Magnesium (Mg)	mg/kg	310	0.69	A760750	2.5	0.42	A760750
Calculated Sodium (Na)	mg/kg	1500	1.7	A760750	7.9	1.1	A760750
Calculated Potassium (K)	mg/kg	23	0.90	A760750	0.91	0.55	A760750
Calculated Chloride (Cl)	mg/kg	9.9	6.9	A760750	<4.2	4.2	A760750
Calculated Sulphate (SO4)	mg/kg	5000	3.5	A760750	30	2.1	A760750
Elements							
Cation exchange capacity	cmol+/Kg				18	10	A760744
Soluble Parameters							
Soluble Chloride (Cl)	mg/L	14	10	A767082	<10	10	A767082
Soluble Conductivity	dS/m	12	0.020	A767888	0.22	0.020	A767888
Soluble (CaCl2) pH	pH	8.09	N/A	A763357	5.20	N/A	A763357
Sodium Adsorption Ratio	N/A	17	0.10	A760749	1.0	0.10	A760749
Soluble Calcium (Ca)	mg/L	540	1.5	A767414	16	1.5	A767414
Soluble Magnesium (Mg)	mg/L	460	1.0	A767414	6.0	1.0	A767414
Soluble Sodium (Na)	mg/L	2200	2.5	A767414	19	2.5	A767414
Soluble Potassium (K)	mg/L	34	1.3	A767414	2.1	1.3	A767414
Saturation %	%	69	N/A	A763353	42	N/A	A763353
Soluble Sulphate (SO4)	mg/L	7300	5.0	A767414	71	5.0	A767414
Theoretical Gypsum Requirement	tonnes/ha	130	0.20	A760752	<0.20	0.20	A760752
RDL = Reportable Detection Limit N/A = Not Applicable							



PHYSICAL TESTING (SOIL)

Bureau Veritas ID		BEI303	BEI304	BEI305		
Sampling Date		2022/08/28	2022/08/28	2022/08/28		
COC Number		1 of 2	1 of 2	1 of 2		
	UNITS	CH22DB027-AP 0-20	CH22DB027-AE 20-25	CH22DB027-BNT 25-43	RDL	QC Batch
Physical Properties						
% sand by hydrometer	%	42	41	40	2.0	A766764
% silt by hydrometer	%	42	35	30	2.0	A766764
Clay Content	%	16	24	31	2.0	A766764
Texture	N/A	LOAM	LOAM	CLAY LOAM	N/A	A758876
RDL = Reportable Detection Limit N/A = Not Applicable						

Bureau Veritas ID		BEI306	BEI307	BEI308				
Sampling Date		2022/08/28	2022/10/03	2022/10/03				
COC Number		1 of 2	1 of 2	1 of 2				
	UNITS	CH22DB027-CK 43-100	QC Batch	CH22SB087-AP 0-13	QC Batch	CH22SB087-BNT 13-37	RDL	QC Batch
Physical Properties								
% sand by hydrometer	%	50	A766431	45	A766764	36	2.0	A767083
% silt by hydrometer	%	21	A766431	32	A766764	26	2.0	A767083
Clay Content	%	30	A766431	23	A766764	38	2.0	A767083
Texture	N/A	SNDY CL LO	A758876	LOAM	A758876	CLAY LOAM	N/A	A758876
RDL = Reportable Detection Limit N/A = Not Applicable								

Bureau Veritas ID		BEI309	BEI310	BEI311			
Sampling Date		2022/10/03	2022/10/03	2022/10/03			
COC Number		1 of 2	1 of 2	1 of 2			
	UNITS	CH22SB087-CK 37-100	QC Batch	CH22SB096-AP 0-13	CH22SB096-BNT 13-30	RDL	QC Batch
Physical Properties							
% sand by hydrometer	%	45	A766764	47	46	2.0	A767083
% silt by hydrometer	%	23	A766764	30	24	2.0	A767083
Clay Content	%	32	A766764	23	30	2.0	A767083
Texture	N/A	SNDY CL LO	A758876	LOAM	SNDY CL LO	N/A	A758876
RDL = Reportable Detection Limit N/A = Not Applicable							



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GOLDER ASSOCIATES LTD
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Site Location: CAPITAL POWER HALKIRK 2
Sampler Initials: DB

PHYSICAL TESTING (SOIL)

Bureau Veritas ID		BEI312	BEI342	BEI343	BEI344		
Sampling Date		2022/10/03	2022/10/04	2022/10/04	2022/10/04		
COC Number		1 of 2	2 of 2	2 of 2	2 of 2		
	UNITS	CH22SB096-CK 30-100	CH22SB015-AH 0-12	CH22SB015-AB 12-30	CH22SB015-BNT 30-49	RDL	QC Batch

Physical Properties							
% sand by hydrometer	%	45	51	63	48	2.0	A766764
% silt by hydrometer	%	21	39	28	26	2.0	A766764
Clay Content	%	34	10	9.1	26	2.0	A766764
Texture	N/A	SNDY CL LO	LOAM	SANDY LOAM	SNDY CL LO	N/A	A758876

RDL = Reportable Detection Limit
N/A = Not Applicable

Bureau Veritas ID		BEI345		BEI346	BEI347		
Sampling Date		2022/10/04		2022/10/04	2022/10/04		
COC Number		2 of 2		2 of 2	2 of 2		
	UNITS	CH22SB015-CK 49-100	QC Batch	CH22SB031-AP 0-10	CH22SB031-BNT 10-26	RDL	QC Batch

Physical Properties							
% sand by hydrometer	%	43	A766431	53	43	2.0	A766764
% silt by hydrometer	%	25	A766431	26	23	2.0	A766764
Clay Content	%	32	A766431	20	34	2.0	A766764
Texture	N/A	CLAY LOAM	A758876	SNDY CL LO	CLAY LOAM	N/A	A758876

RDL = Reportable Detection Limit
N/A = Not Applicable

Bureau Veritas ID		BEI348		BEI349		BEI350		
Sampling Date		2022/10/04		2022/10/06		2022/10/06		
COC Number		2 of 2		2 of 2		2 of 2		
	UNITS	CH22SB031-CK 26-100	QC Batch	CH22SB187-AP 0-11	QC Batch	CH22SB187-BNT 11-30	RDL	QC Batch

Physical Properties								
% sand by hydrometer	%	42	A766764	60	A766764	39	2.0	A767083
% silt by hydrometer	%	25	A766764	25	A766764	26	2.0	A767083
Clay Content	%	33	A766764	16	A766764	35	2.0	A767083
Texture	N/A	CLAY LOAM	A758876	SANDY LOAM	A760751	CLAY LOAM	N/A	A760751

RDL = Reportable Detection Limit
N/A = Not Applicable



BUREAU
VERITAS

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GOLDER ASSOCIATES LTD
Client Project #: 21452763
Site Location: CAPITAL POWER HALKIRK 2
Sampler Initials: DB

PHYSICAL TESTING (SOIL)

Bureau Veritas ID		BEI351	BEI352	BEI353	BEI354		
Sampling Date		2022/10/06	2022/10/06	2022/10/06	2022/10/06		
COC Number		2 of 2	2 of 2	2 of 2	2 of 2		
	UNITS	CH22SB187-CK 30-100	CH22SB104-AP0-16	CH22S104-BNT 16-34	CH22SB104-CK 34-100	RDL	QC Batch

Physical Properties							
% sand by hydrometer	%	45	41	37	41	2.0	A766764
% silt by hydrometer	%	22	40	29	25	2.0	A766764
Clay Content	%	33	19	34	34	2.0	A766764
Texture	N/A	CLAY LOAM	LOAM	CLAY LOAM	CLAY LOAM	N/A	A760751

RDL = Reportable Detection Limit
N/A = Not Applicable

Bureau Veritas ID		BEI355		BEI356	BEI357		
Sampling Date		2022/10/07		2022/10/07	2022/10/07		
COC Number		2 of 2		2 of 2	2 of 2		
	UNITS	CH22DB076-AP 0-13	QC Batch	CH22DB076-AB 13-20	CH22DB076-BNT 20-31	RDL	QC Batch

Physical Properties							
% sand by hydrometer	%	30	A767083	31	21	2.0	A766764
% silt by hydrometer	%	43	A767083	52	40	2.0	A766764
Clay Content	%	27	A767083	17	39	2.0	A766764
Texture	N/A	LOAM	A760751	SILT LOAM	CLAY LOAM	N/A	A760751

RDL = Reportable Detection Limit
N/A = Not Applicable

Bureau Veritas ID		BEI358		BEI359		
Sampling Date		2022/10/07		2022/10/08		
COC Number		2 of 2		2 of 2		
	UNITS	CH22DB076-CK 31-100	QC Batch	CH22SB097-BNT 31-45	RDL	QC Batch

Physical Properties						
% sand by hydrometer	%	27	A767083	27	2.0	A766764
% silt by hydrometer	%	26	A767083	37	2.0	A766764
Clay Content	%	47	A767083	36	2.0	A766764
Texture	N/A	CLAY	A760751	CLAY LOAM	N/A	A760751

RDL = Reportable Detection Limit
N/A = Not Applicable



BUREAU
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GOLDER ASSOCIATES LTD
Client Project #: 21452763
Site Location: CAPITAL POWER HALKIRK 2
Sampler Initials: DB

MISCELLANEOUS (SOIL)

Bureau Veritas ID		BEI303		BEI304		BEI307		
Sampling Date		2022/08/28		2022/08/28		2022/10/03		
COC Number		1 of 2		1 of 2		1 of 2		
	UNITS	CH22DB027-AP 0-20	QC Batch	CH22DB027-AE 20-25	QC Batch	CH22SB087-AP 0-13	RDL	QC Batch

Misc. Inorganics								
Total Organic Carbon (C)	%	3.7	A765123	1.3	A764748	2.9	0.050	A765123
RDL = Reportable Detection Limit								

Bureau Veritas ID		BEI310		BEI342		BEI346		
Sampling Date		2022/10/03		2022/10/04		2022/10/04		
COC Number		1 of 2		2 of 2		2 of 2		
	UNITS	CH22SB096-AP 0-13	QC Batch	CH22SB015-AH 0-12	CH22SB031-AP 0-10	RDL	QC Batch	

Misc. Inorganics								
Total Organic Carbon (C)	%	2.8	A764748	5.0		2.5	0.050	A765123
RDL = Reportable Detection Limit								

Bureau Veritas ID		BEI349		BEI352		BEI355		
Sampling Date		2022/10/06		2022/10/06		2022/10/07		
COC Number		2 of 2		2 of 2		2 of 2		
	UNITS	CH22SB187-AP 0-11	QC Batch	CH22SB104-AP0-16	CH22DB076-AP 0-13	RDL	QC Batch	

Misc. Inorganics								
Total Organic Carbon (C)	%	2.1	A764748	3.7		1.7	0.050	A765123
RDL = Reportable Detection Limit								



GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	15.7°C
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Sample BEI303 [CH22DB027-AP 0-20] : Sample was analyzed past method specified hold time for pH @25C (1:2 Calcium Chloride Extract). Sample was analyzed past method specified hold time for Total Organic Carbon LECO Method. Sample was analyzed past method specified hold time for Texture by Hydrometer. Sample was analyzed past method specified hold time for Chloride (Soluble). Sample was analyzed past method specified hold time for Conductivity @25C (Soluble).

Sample BEI304 [CH22DB027-AE 20-25] : Sample was analyzed past method specified hold time for Chloride (Soluble). Sample was analyzed past method specified hold time for Total Organic Carbon LECO Method. Sample was analyzed past method specified hold time for Conductivity @25C (Soluble). Sample was analyzed past method specified hold time for pH @25C (1:2 Calcium Chloride Extract). Sample was analyzed past method specified hold time for Texture by Hydrometer.

Sample BEI305 [CH22DB027-BNT 25-43] : Sample was analyzed past method specified hold time for pH @25C (1:2 Calcium Chloride Extract). Sample was analyzed past method specified hold time for Texture by Hydrometer. Sample was analyzed past method specified hold time for Chloride (Soluble). Sample was analyzed past method specified hold time for Conductivity @25C (Soluble).

Sample BEI306 [CH22DB027-CK 43-100] : Sample was analyzed past method specified hold time for Chloride (Soluble). Sample was analyzed past method specified hold time for Conductivity @25C (Soluble). Sample was analyzed past method specified hold time for pH @25C (1:2 Calcium Chloride Extract). SANDY CL LO = SANDY CLAY LOAM Sample was analyzed past method specified hold time for Texture by Hydrometer.

Sample BEI309 [CH22SB087-CK 37-100] : SANDY CL LO = SANDY CLAY LOAM

Sample BEI311 [CH22SB096-BNT 13-30] : SANDY CL LO = SANDY CLAY LOAM

Sample BEI312 [CH22SB096-CK 30-100] : SANDY CL LO = SANDY CLAY LOAM

Sample BEI344 [CH22SB015-BNT 30-49] : SANDY CL LO = SANDY CLAY LOAM

Sample BEI346 [CH22SB031-AP 0-10] : SANDY CL LO = SANDY CLAY LOAM

Results relate only to the items tested.



BUREAU
VERITAS

Bureau Veritas Job #: C280078
Report Date: 2022/10/26

GOLDER ASSOCIATES LTD
Client Project #: 21452763
Site Location: CAPITAL POWER HALKIRK 2
Sampler Initials: DB

QUALITY ASSURANCE REPORT

QA/QC	Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
A763353	SWK		QC Standard	Saturation %	2022/10/20		100	%	75 - 125
A763353	SWK		RPD [BEI344-01]	Saturation %	2022/10/20	6.8		%	12
A763357	SFU		QC Standard	Soluble (CaCl2) pH	2022/10/20		98	%	97 - 103
A763357	SFU		Spiked Blank	Soluble (CaCl2) pH	2022/10/20		100	%	97 - 103
A763357	SFU		RPD [BEI344-01]	Soluble (CaCl2) pH	2022/10/20	0.79		%	N/A
A763397	ABQ		QC Standard	Saturation %	2022/10/20		105	%	75 - 125
A763397	ABQ		RPD	Saturation %	2022/10/20	5.8		%	12
A763400	SFU		QC Standard	Soluble (CaCl2) pH	2022/10/20		98	%	97 - 103
A763400	SFU		Spiked Blank	Soluble (CaCl2) pH	2022/10/20		100	%	97 - 103
A763400	SFU		RPD	Soluble (CaCl2) pH	2022/10/20	0.029		%	N/A
A764527	SWK		QC Standard	Saturation %	2022/10/20		103	%	75 - 125
A764527	SWK		RPD	Saturation %	2022/10/20	0.82		%	12
A764532	SFU		QC Standard	Soluble (CaCl2) pH	2022/10/20		100	%	97 - 103
A764532	SFU		Spiked Blank	Soluble (CaCl2) pH	2022/10/20		100	%	97 - 103
A764532	SFU		RPD	Soluble (CaCl2) pH	2022/10/20	0.11		%	N/A
A764748	PL		QC Standard	Total Organic Carbon (C)	2022/10/20		104	%	75 - 125
A764748	PL		Spiked Blank	Total Organic Carbon (C)	2022/10/20		101	%	80 - 120
A764748	PL		Method Blank	Total Organic Carbon (C)	2022/10/20	<0.050		%	
A764748	PL		RPD	Total Organic Carbon (C)	2022/10/20	0.45		%	35
A765123	PL		QC Standard	Total Organic Carbon (C)	2022/10/21		105	%	75 - 125
A765123	PL		Spiked Blank	Total Organic Carbon (C)	2022/10/21		97	%	80 - 120
A765123	PL		Method Blank	Total Organic Carbon (C)	2022/10/21	<0.050		%	
A765123	PL		RPD [BEI342-01]	Total Organic Carbon (C)	2022/10/21	0.88		%	35
A766254	MPU		Matrix Spike	Soluble Calcium (Ca)	2022/10/21		112	%	75 - 125
				Soluble Magnesium (Mg)	2022/10/21		116	%	75 - 125
				Soluble Sodium (Na)	2022/10/21		106	%	75 - 125
				Soluble Potassium (K)	2022/10/21		113	%	75 - 125
A766254	MPU		QC Standard	Soluble Calcium (Ca)	2022/10/21		83	%	75 - 125
				Soluble Magnesium (Mg)	2022/10/21		91	%	75 - 125
				Soluble Sodium (Na)	2022/10/21		88	%	75 - 125
				Soluble Potassium (K)	2022/10/21		105	%	75 - 125
				Soluble Sulphate (SO4)	2022/10/21		86	%	75 - 125
A766254	MPU		Spiked Blank	Soluble Calcium (Ca)	2022/10/21		105	%	80 - 120
				Soluble Magnesium (Mg)	2022/10/21		109	%	80 - 120
				Soluble Sodium (Na)	2022/10/21		101	%	80 - 120
				Soluble Potassium (K)	2022/10/21		106	%	80 - 120
A766254	MPU		Method Blank	Soluble Calcium (Ca)	2022/10/21	<1.5		mg/L	
				Soluble Magnesium (Mg)	2022/10/21	<1.0		mg/L	
				Soluble Sodium (Na)	2022/10/21	<2.5		mg/L	
				Soluble Potassium (K)	2022/10/21	<1.3		mg/L	
				Soluble Sulphate (SO4)	2022/10/21	<5.0		mg/L	
A766254	MPU		RPD	Soluble Calcium (Ca)	2022/10/21	10		%	30
				Soluble Magnesium (Mg)	2022/10/21	8.7		%	30
				Soluble Sodium (Na)	2022/10/21	5.3		%	30
				Soluble Potassium (K)	2022/10/21	5.6		%	30
				Soluble Sulphate (SO4)	2022/10/21	4.5		%	30
A766342	ZI		Matrix Spike	Soluble Chloride (Cl)	2022/10/21		105	%	75 - 125
A766342	ZI		QC Standard	Soluble Chloride (Cl)	2022/10/21		95	%	75 - 125
A766342	ZI		Spiked Blank	Soluble Chloride (Cl)	2022/10/21		106	%	80 - 120
A766342	ZI		Method Blank	Soluble Chloride (Cl)	2022/10/21	<10		mg/L	
A766342	ZI		RPD	Soluble Chloride (Cl)	2022/10/21	6.9		%	30
A766431	SJA		QC Standard	% sand by hydrometer	2022/10/21		103	%	75 - 125
				% silt by hydrometer	2022/10/21		100	%	75 - 125



BUREAU
VERITAS

Bureau Veritas Job #: C280078
Report Date: 2022/10/26

GOLDER ASSOCIATES LTD
Client Project #: 21452763
Site Location: CAPITAL POWER HALKIRK 2
Sampler Initials: DB

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
A766431	SJA	RPD	Clay Content	2022/10/21		97	%	75 - 125
			% sand by hydrometer	2022/10/21	3.1		%	30
			% silt by hydrometer	2022/10/21	10		%	30
			Clay Content	2022/10/21	1.5		%	30
A766641	LZO	QC Standard	Soluble Conductivity	2022/10/21		97	%	75 - 125
A766641	LZO	Spiked Blank	Soluble Conductivity	2022/10/21		100	%	90 - 110
A766641	LZO	Method Blank	Soluble Conductivity	2022/10/21	<0.020		dS/m	
A766641	LZO	RPD	Soluble Conductivity	2022/10/21	5.3		%	20
A766764	SJA	QC Standard	% sand by hydrometer	2022/10/21		103	%	75 - 125
			% silt by hydrometer	2022/10/21		97	%	75 - 125
			Clay Content	2022/10/21		99	%	75 - 125
			% sand by hydrometer	2022/10/21	6.4		%	30
A766764	SJA	RPD [BEI344-01]	% silt by hydrometer	2022/10/21	6.2		%	30
			Clay Content	2022/10/21	5.2		%	30
			Soluble Calcium (Ca)	2022/10/21		98	%	75 - 125
A766820	SJK	Matrix Spike	Soluble Magnesium (Mg)	2022/10/21		100	%	75 - 125
			Soluble Sodium (Na)	2022/10/21		96	%	75 - 125
			Soluble Potassium (K)	2022/10/21		95	%	75 - 125
			Soluble Sulphate (SO4)	2022/10/21		104	%	75 - 125
A766820	SJK	QC Standard	Soluble Calcium (Ca)	2022/10/21		103	%	75 - 125
			Soluble Magnesium (Mg)	2022/10/21		109	%	75 - 125
			Soluble Sodium (Na)	2022/10/21		110	%	75 - 125
			Soluble Potassium (K)	2022/10/21		107	%	75 - 125
A766820	SJK	Spiked Blank	Soluble Calcium (Ca)	2022/10/21		99	%	80 - 120
			Soluble Magnesium (Mg)	2022/10/21		100	%	80 - 120
			Soluble Sodium (Na)	2022/10/21		96	%	80 - 120
			Soluble Potassium (K)	2022/10/21		96	%	80 - 120
A766820	SJK	Method Blank	Soluble Calcium (Ca)	2022/10/21	<1.5		mg/L	
			Soluble Magnesium (Mg)	2022/10/21	<1.0		mg/L	
			Soluble Sodium (Na)	2022/10/21	<2.5		mg/L	
			Soluble Potassium (K)	2022/10/21	<1.3		mg/L	
			Soluble Sulphate (SO4)	2022/10/21	<5.0		mg/L	
A766820	SJK	RPD	Soluble Calcium (Ca)	2022/10/21	2.5		%	30
			Soluble Magnesium (Mg)	2022/10/21	3.2		%	30
			Soluble Sodium (Na)	2022/10/21	1.5		%	30
			Soluble Potassium (K)	2022/10/21	2.5		%	30
			Soluble Sulphate (SO4)	2022/10/21	0.71		%	30
A767082	ZI	Matrix Spike [BEI358-01]	Soluble Chloride (Cl)	2022/10/21		96	%	75 - 125
A767082	ZI	QC Standard	Soluble Chloride (Cl)	2022/10/21		104	%	75 - 125
A767082	ZI	Spiked Blank	Soluble Chloride (Cl)	2022/10/21		96	%	80 - 120
A767082	ZI	Method Blank	Soluble Chloride (Cl)	2022/10/21	<10		mg/L	
A767082	ZI	RPD [BEI344-01]	Soluble Chloride (Cl)	2022/10/21	2.0		%	30
A767083	SJA	QC Standard	% sand by hydrometer	2022/10/22		103	%	75 - 125
			% silt by hydrometer	2022/10/22		99	%	75 - 125
			Clay Content	2022/10/22		96	%	75 - 125
			% sand by hydrometer	2022/10/22	10		%	30
A767083	SJA	RPD [BEI355-01]	% silt by hydrometer	2022/10/22	0.43		%	30
			Clay Content	2022/10/22	14		%	30
			Soluble Chloride (Cl)	2022/10/21		98	%	75 - 125
A767198	ZI	QC Standard	Soluble Chloride (Cl)	2022/10/21		92	%	75 - 125
A767198	ZI	Spiked Blank	Soluble Chloride (Cl)	2022/10/21		97	%	80 - 120
A767198	ZI	Method Blank	Soluble Chloride (Cl)	2022/10/21	<10		mg/L	
A767198	ZI	RPD	Soluble Chloride (Cl)	2022/10/21	8.6		%	30



QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
A767414	JAB	Matrix Spike [BEI359-01]	Soluble Calcium (Ca)	2022/10/21		93	%	75 - 125
			Soluble Magnesium (Mg)	2022/10/21		98	%	75 - 125
			Soluble Sodium (Na)	2022/10/21		88	%	75 - 125
			Soluble Potassium (K)	2022/10/21		95	%	75 - 125
A767414	JAB	QC Standard	Soluble Calcium (Ca)	2022/10/21		91	%	75 - 125
			Soluble Magnesium (Mg)	2022/10/21		103	%	75 - 125
			Soluble Sodium (Na)	2022/10/21		101	%	75 - 125
			Soluble Potassium (K)	2022/10/21		110	%	75 - 125
A767414	JAB	Spiked Blank	Soluble Sulphate (SO4)	2022/10/21		98	%	75 - 125
			Soluble Calcium (Ca)	2022/10/21		93	%	80 - 120
			Soluble Magnesium (Mg)	2022/10/21		97	%	80 - 120
			Soluble Sodium (Na)	2022/10/21		87	%	80 - 120
A767414	JAB	Method Blank	Soluble Potassium (K)	2022/10/21		94	%	80 - 120
			Soluble Calcium (Ca)	2022/10/23	<1.5		mg/L	
			Soluble Magnesium (Mg)	2022/10/23	<1.0		mg/L	
			Soluble Sodium (Na)	2022/10/23	<2.5		mg/L	
A767414	JAB	RPD [BEI344-01]	Soluble Potassium (K)	2022/10/23	<1.3		mg/L	
			Soluble Sulphate (SO4)	2022/10/23	<5.0		mg/L	
			Soluble Calcium (Ca)	2022/10/23	24	%	30	
			Soluble Magnesium (Mg)	2022/10/23	20	%	30	
			Soluble Sodium (Na)	2022/10/23	16	%	30	
A767888	ZI	QC Standard	Soluble Potassium (K)	2022/10/23	6.3	%	30	
A767888	ZI	QC Standard	Soluble Sulphate (SO4)	2022/10/23	19	%	30	
A767888	ZI	Spiked Blank	Soluble Conductivity	2022/10/22		116	%	75 - 125
A767888	ZI	Method Blank	Soluble Conductivity	2022/10/22		100	%	90 - 110
A767888	ZI	Method Blank	Soluble Conductivity	2022/10/22	<0.020		dS/m	
A767888	ZI	RPD [BEI344-01]	Soluble Conductivity	2022/10/22	19		%	20
A768297	STB	QC Standard	Soluble Conductivity	2022/10/22		105	%	75 - 125
A768297	STB	Spiked Blank	Soluble Conductivity	2022/10/22		99	%	90 - 110
A768297	STB	Method Blank	Soluble Conductivity	2022/10/22	<0.020		dS/m	
A768297	STB	RPD	Soluble Conductivity	2022/10/22	3.2		%	20

N/A = Not Applicable

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.



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Bureau Veritas Job #: C280078
Report Date: 2022/10/26

GOLDER ASSOCIATES LTD
Client Project #: 21452763
Site Location: CAPITAL POWER HALKIRK 2
Sampler Initials: DB

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:

Maria Magdalena Florescu, Ph.D., P.Chem., QP, Inorganics Manager



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0235



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 Edmonton: 9331-48 St. T6B 2R4. Toll Free (800) 386-7247
 bvlab.com

CHAIN OF CUSTODY RECORD

Invoice Information		Report Information (if differs from invoice)				Project Information										Turnaround Time (TAT) Required																					
Company: WSP Golder		Company:				Quotation #:										<input checked="" type="checkbox"/> 5 - 7 Days Regular (Most analyses)																					
Contact Name: Claire Kisko		Contact Name:				P.O. #/ AFE#:										PLEASE PROVIDE ADVANCE NOTICE FOR RUSH PROJECTS																					
Address: 106820 107 Ave NW Edmonton, AB, T5P 4C3		Address:				Project #: 21452763										Rush TAT (Surcharges will be applied)																					
Phone: 587-336-4040		Phone:				Site Location: Capital Power Halkirk 2										<input type="checkbox"/> Same Day <input type="checkbox"/> 2 Days <input type="checkbox"/> 1 Day <input type="checkbox"/> 3-4 Days																					
Email: claire.kisko@wsp.com		Email:				Site #:										Date Required:																					
Copies: sarah.clark@wsp.com		Copies:				Sampled By: David Brown										Rush Confirmation #:																					
Laboratory Use Only						Analysis Requested										Regulatory Criteria																					
<table border="1"> <tr><td>Seal Present</td><td>YES</td><td>NO</td><td>Cooler ID</td></tr> <tr><td>Seal Intact</td><td><input checked="" type="checkbox"/></td><td><input checked="" type="checkbox"/></td><td>Temp 16 15 16</td></tr> <tr><td>Cooling Media</td><td><input checked="" type="checkbox"/></td><td><input checked="" type="checkbox"/></td><td></td></tr> </table>		Seal Present	YES	NO	Cooler ID	Seal Intact	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Temp 16 15 16	Cooling Media	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		Depot Reception				# of containers	<input type="checkbox"/> VOC	<input type="checkbox"/> BTEX F1-F2	<input type="checkbox"/> BTEX F1-F4	<input type="checkbox"/> Routine Water	<input type="checkbox"/> Regulated Metals Tot	<input type="checkbox"/> Diss	<input type="checkbox"/> Dissolved	<input type="checkbox"/> Mercury Total	<input type="checkbox"/> Salinity 4	<input type="checkbox"/> Sieve (75 micron)	<input type="checkbox"/> Texture (% Sand, Silt, Clay)	<input type="checkbox"/> Basic Class II Landfill	<input type="checkbox"/> CEC - exchangeable Ca/Na	<input type="checkbox"/> TOC	HOLD - DO NOT ANALYZE	<input type="checkbox"/> AT1 <input checked="" type="checkbox"/> CCME <input type="checkbox"/> Drinking Water <input type="checkbox"/> D50 (Drilling Waste) <input type="checkbox"/> Saskatchewan <input type="checkbox"/> Other:			
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Seal Present	YES	NO	Cooler ID																																		
Seal Intact			Temp																																		
Cooling Media																																					
Sample Identification		Depth (Unit)	Date Sampled (YYYY/MM/DD)	Time Sampled (HH:MM)	Matrix																																
1	CH22DB027-Ap(0-20)	-	2022-08-28	-	soil								X	X					X	X																	
2	CH22DB027-Ae(20-25)	-	2022-08-28	-	soil								X	X					X	X																	
3	CH22DB027-Bnt(25-43)	-	2022-08-28	-	soil								X	X	X				X	X																	
4	CH22DB027-Ck(43-100)	-	2022-08-28	-	soil								X	X					X	X																	
5	CH22SB087-Ap(0-13)	-	2022-10-03	-	soil								X	X					X	X																	
6	CH22SB087-Bnt(13-37)	-	2022-10-03	-	soil								X	X	X				X	X																	
7	CH22SB087-Ck(37-100)	-	2022-10-03	-	soil								X	X					X	X																	
8	CH22SB096-Ap(0-13)	-	2022-10-03	-	soil								X	X					X	X																	
9	CH22SB096-Bnt(13-30)	-	2022-10-03		soil								X	X	X				X	X																	
10	CH22SB096-Ck(30-100)	-	2022-10-03		soil								X	X					X	X																	
Please indicate Filtered, Preserved or Both (F, P, F/P)																																					
Relinquished by: (Signature/Print)		DATE (YYYY/MM/DD)	Time (HH:MM)	Received by: (Signature/Print)		DATE (YYYY/MM/DD)	Time (HH:MM)	BV Job #																													
David Brown		2022-10-11	12:00			2022/10/13	10:00	C280078																													
<small>Unless otherwise agreed to in writing, work submitted on this Chain of Custody is subject to Bureau Veritas Laboratories' standard Terms and Conditions. Signing of this Chain of Custody document is acknowledgment and acceptance of our terms which are available for viewing at http://www.bvlab.com/terms-and-conditions</small>																																					

APPENDIX G

**Vegetation Field Inspection
Data and Species Inventory**

Table G-1: Dominant Species Observed Within the Halkirk Limit of Disturbance (LOD)

Strata	Common Name	Scientific Name	Native or Exotic ^(a)	Provincial Rank ^(b)
Forb	Canada (creeping) thistle	<i>Cirsium arvense</i>	Exotic	SNA
	carpet vervain	<i>Verbena bracteata</i>	Native	S3
	yellow sweet clover	<i>Melilotus officinalis</i>	Exotic	SNA
	pineapple weed	<i>Matricaria discoidea</i>	Exotic	SNA
Graminoid	awned sedge	<i>Carex atherodes</i>	Native	S5
	barley	<i>Hordeum vulgare</i>	Exotic	SNA
	Rapeseed (canola)	<i>Brassica napus</i>	Exotic	SNA
	crested wheatgrass	<i>Agropyron cristatum</i>	Exotic	SNA
	fowl bluegrass	<i>Poa palustris</i>	Native	S5
	foxtail barley	<i>Hordeum jubatum</i>	Native	S5
	Kentucky bluegrass	<i>Poa pratensis</i>	Native	S5
	large barnyard grass	<i>Echinochloa crusgalli</i>	Exotic	SNA
	wild oat	<i>Avena fatua</i>	Exotic	SNA
	pumpelly brome	<i>Bromus pumpellianus</i>	Native	S5
	reed canary grass	<i>Phalaris arundinacea</i>	Native	S5
	slender wildrye	<i>Elymus trachycaulus</i>	Native	S5
	smooth brome	<i>Bromus inermis</i>	Exotic	SNA
	tufted hairgrass	<i>Deschampsia cespitosa</i>	Native	S5
	common wheat	<i>Triticum aestivum</i>	Exotic	SNA
Moss	Limprichtia moss	<i>Limprichtia revolvens</i>	Native	S4

(a) Native or Exotic status is used to identify weed species (ACIMS 2022)

(b) Provincial conservation ranking definitions (ACIMS 2018):

S3: Known from 100 or fewer occurrences, or somewhat vulnerable due to other factors, such as restricted range, relatively small population sizes or other factors

S4: Apparently secure, taxon is uncommon but not rare, and potentially some cause for long term concern due to declines or other factors.

S5: Secure- taxon is common, widespread and abundant

SNA: Not applicable. A conservation status rank is not applicable because the species or ecosystem is not a suitable target for conservation activities.

(c) Dominant species cover constitutes of cover greater than 5%

n/a= Not Applicable

REFERENCES

- ACIMS (Alberta Conservation Information Management System). 2018. Species Conservation Ranks. [Accessed February 2023]. <https://www.albertaparks.ca/albertaparksca/management-land-use/alberta-conservation-information-management-system-acims/tracking-watch-lists/species-conservation-ranks/>.
- ACIMS (Alberta Conservation Information Management System). 2022. Element Occurrence Data. [Accessed February 2023]. <https://www.albertaparks.ca/albertaparksca/management-land-use/alberta-conservation-information-management-system-acims/download-data/>.

APPENDIX H

Representative Soil and Landcover Field Photos

1.0 PLOT PHOTOGRAPHS

1.1 Soil Plots in the LOD



Photo H-1: Plot CH22DB048 showing undulating, low relief landscape.



Photo H-2: Plot CH22DB048 showing Dark Brown Solonetz soil pit.



Photo H-3: Plot CH22SB078 showing Solonetzic Dark Brown Chernozem soil pit.



Photo H-4: Plot CH22SB188 showing Dark Brown Solonchized Solonetz soil pit.



Photo H-5: Plot CH22DB109 showing Orthic Dark Brown Chernozem soil pit.



Photo H-6: Plot CH22SB190 showing Gleyed Dark Brown Chernozem soil pit. Note orange mottling toward the bottom of the visible soil pit.



Photo H-7: Plot CH22SB110a showing soil pit for a Humic Luvic Gleysol.



Photo H-8: Plot CH22SB061 showing soil pit for a Dark Brown Solonetz.

1.2 Examples of Landcover Types in the LOD

Note: Photos not available for road/trail, developed, and farmyard landcover types as these were desktop assessed



Photo H-9: Example of a cultivated landcover type in the LOD at Plot HAL22DW2286



Photo H-10: Example of an aspen/mixed forest landcover type in the LOD at Plot HAL22BR012



Photo H-11: Example of an ephemeral waterbody in the LOD at Plot W2539



PhotoH-12: Example of a natural drainage in the LOD at Plot W139



Photo H-13: Example of a modified grassland landcover type in the LOD at Plot HAL22DDL14



Photo H-14: Example a tame pasture landcover type in the LOD near W2505



Photo H-15: Example of a wetland (temporary graminoid marsh, M-G [II]) at Plot HAL22BW021 (W2107A)



Photo H-16: Example of a modified pasture landcover type in the LOD at Plot HAL22BL022

APPENDIX I

**ACIMS Species and Communities within
the Central Parkland Natural Subregion**

**Table I-1: 2022 Alberta Conservation Information Management System (ACIMS)
Tracked Plant Species and Ecological Communities in the Central Parkland Natural Subregion**

Common Name	Scientific Name	Provincial Rank ^(a)	COSEWIC ^(b)	SARA ^(b)
plains rough fescue - western porcupine grass grassland	<i>Festuca hallii</i> - <i>Hesperostipa curtisetata</i> grassland	S2S3	-	-
plains rough fescue - sand grass grassland	<i>Festuca hallii</i> - <i>Calamovilfa longifolia</i> grassland	S1	-	-
plains rough fescue - June grass / juniper / forb grassland	<i>Festuca hallii</i> - <i>Koeleria macrantha</i> / <i>Juniperus horizontalis</i> / forb grassland	S2	-	-
creeping juniper / (June grass) / green reindeer lichen stabilized dune community	<i>Juniperus horizontalis</i> / (<i>Koeleria macrantha</i>) / <i>Cladonia arbuscula</i> ssp. <i>mitis</i> stabilized dune community	S1S2	-	-
plains rough fescue grassland	<i>Festuca hallii</i> grassland	S1	-	-
Hobomok Skipper	<i>Poanes hobomok hobomok</i>	S2	-	-
Lorquin's Admiral	<i>Limenitis lorquini burrisoni</i>	S2	-	-
Common Green Darner	<i>Anax junius</i>	S3B,SNRN,SNRM	-	-
Crimson-ringed Whiteface	<i>Leucorrhinia glacialis</i>	S3S4	-	-
Western Red Damsel	<i>Amphiagrion abbreviatum</i>	S3	-	-
cat-tongue liverwort	<i>Conocephalum salebrosum</i>	S2S4	-	-
Fragrant Macewort	<i>Mannia fragrans</i>	SU	-	-
Small Macewort	<i>Mannia pilosa</i>	SU	-	-
Delicate Germanderwort	<i>Riccardia multifida</i>	SU	-	-
Purple-fringed Riccia	<i>Ricciocarpos natans</i>	SU	-	-

Common Name	Scientific Name	Provincial Rank ^(a)	COSEWIC ^(b)	SARA ^(b)
short-tooth hump moss	<i>Amblyodon dealbatus</i>	S3	-	-
Woodsy Ragged Moss	<i>Sciuro-hypnum hylotapetum</i>	S1S3	-	-
Swamp Bryum	<i>Ptychostomum cernuum</i>	S1S2	-	-
campylium moss	<i>Pseudocampylium radicale</i>	S3	-	-
narrow-leaved chain-teeth moss	<i>Tortula cernua</i>	S1	-	-
Heim's Chain-teeth Moss	<i>Henediella heimii</i>	S2S3	-	-
Ontario Broom Moss	<i>Dicranum ontariense</i>	S1S2	-	-
blunt-leaved hair moss	<i>Didymodon tophaceus</i>	S2S3	-	-
False Beard Moss	<i>Didymodon fallax</i>	S2S3	-	-
Long-leaved Hook Moss	<i>Drepanocladus longifolius</i>	SU	-	-
Lime Silk Moss	<i>Entodon concinnus</i>	S1S2	-	-
Schleicher's silk moss	<i>Entodon schleicheri</i>	S2S3	-	-
Common Leske's Moss	<i>Leskea gracilescens</i>	S2	-	-
Blunt Leske's Moss	<i>Leskea obscura</i>	S1	-	-
Many-fruited Leske's Moss	<i>Leskea polycarpa</i>	S1	-	-
bladder-cap moss	<i>Physcomitrium hookeri</i>	S2	-	-
Purple Nodding Moss	<i>Pohlia atropurpurea</i>	S2	-	-

Common Name	Scientific Name	Provincial Rank ^(a)	COSEWIC ^(b)	SARA ^(b)
Ontario Rhodobryum moss	<i>Rhodobryum ontariense</i>	S1S2	-	-
Philibert's Fern Moss	<i>Thuidium philibertii</i>	S1S2	-	-
Cosson's Hook Moss	<i>Limprichtia cossonii</i>	SU	-	-
Virginia Haplocladium Moss	<i>Haplocladium virginianum</i>	S1S2	-	-
bumpy rim-lichen	<i>Lecanora hybocarpa</i>	SU	-	-
dot lichen	<i>Micarea melaena</i>	S2S4	-	-
Six-celled Moss Dot Lichen	<i>Bilimbia sabuletorum</i>	S2S4	-	-
bottlebrush frost lichen	<i>Physconia isidiigera</i>	S2	-	-
common antler lichen	<i>Pseudevernia consocians</i>	S2	-	-
mottled-disk lichen	<i>Trapeliopsis flexuosa</i>	SU	-	-
black woodscript lichen	<i>Xylographa parallela</i>	SU	-	-
Small-footed Sunburst Lichen	<i>Xanthomendoza montana</i>	S3	-	-
Hairy shadow lichen	<i>Phaeophyscia hirsuta</i>	S2	-	-
Exuberant Rosette Lichen	<i>Physcia dimidiata</i>	S2	-	-
flat fruited pelt lichen	<i>Peltigera horizontalis</i>	S2S4	-	-
sand-loving Iceland lichen	<i>Cetraria arenaria</i>	S1S2	-	-
smooth sweet cicely	<i>Osmorhiza longistylis</i>	S3	-	-
tall blue lettuce	<i>Lactuca biennis</i>	S3	-	-
annual skeletonweed	<i>Shinnersoseris rostrata</i>	S3	-	-
flat-topped white aster	<i>Doellingeria umbellata</i> var. <i>pubens</i>	S3	-	-
Marsh Alkali Aster	<i>Almutaster pauciflorus</i>	S3	-	-
dark-green goosefoot	<i>Chenopodium atrovirens</i>	S1	-	-
marsh gentian	<i>Gentiana fremontii</i>	S3	-	-
shrubby evening-primrose	<i>Oenothera serrulata</i>	S3	-	-
lance-leaved loosestrife	<i>Lysimachia hybrida</i>	S3	-	-

Common Name	Scientific Name	Provincial Rank ^(a)	COSEWIC ^(b)	SARA ^(b)
sandhills cinquefoil	<i>Potentilla lasiodonta</i>	S3	-	-
long-leaved bluets	<i>Houstonia longifolia</i>	S3	-	-
clammy hedge-hyssop	<i>Gratiola neglecta</i>	S3	-	-
Geyer's yellow monkeyflower	<i>Erythranthe geyeri</i>	S1	-	-
crowfoot violet	<i>Viola pedatifida</i>	S3	-	-
Crawe's sedge	<i>Carex crawei</i>	S3	-	-
Fox Sedge	<i>Carex vulpinoidea</i>	S3	-	-
slender beak-rush	<i>Rhynchospora capillacea</i>	S2	-	-
river bulrush	<i>Bolboschoenus fluviatilis</i>	S1	-	-
Columbia watermeal	<i>Wolffia columbiana</i>	S2	-	-
slender naiad	<i>Najas flexilis</i>	S3	-	-
bog adder's-mouth	<i>Malaxis paludosa</i>	S2S3	-	-
Canada brome	<i>Bromus latiglumis</i>	S1	-	-
Leiberg's millet	<i>Dichanthelium leibergii</i>	S1	-	-
Wilcox's panicgrass	<i>Dichanthelium wilcoxianum</i>	S2	-	-
Canada rice grass	<i>Piptatheropsis canadensis</i>	S2	-	-
widgeon-grass	<i>Ruppia cirrhosa</i>	S3	-	-
field grape fern	<i>Botrychium campestre</i>	S3	-	-
spatulate moonwort	<i>Botrychium spathulatum</i>	S3	-	-
Kelsey's cat's eye	<i>Cryptantha kelseyana</i>	S3	-	-
samphire emergent marsh	<i>Salicornia rubra</i> Salt Flat	S2	-	-
Nevada bulrush - (seaside arrow-grass) emergent marsh	<i>Amphiscirpus nevadensis</i> - (<i>Triglochin maritima</i>) emergent marsh	S2S3	-	-
alkali cord grass - (western wheat grass) saline meadow	<i>Spartina gracilis</i> - (<i>Pascopyrum smithii</i>) saline meadow	S2S3	-	-
seaside arrow-grass emergent marsh	<i>Triglochin maritima</i> emergent marsh	S2?	-	-
Nuttall's salt-meadow grass community	<i>Puccinellia nuttalliana</i> Salt Marsh	S3?	-	-
Nevada Buck Moth	<i>Hemileuca nevadensis</i>	S1	-	-

Common Name	Scientific Name	Provincial Rank ^(a)	COSEWIC ^(b)	SARA ^(b)
sand grass - sand dropseed dune community	<i>Calamovilfa longifolia</i> - <i>Sporobolus cryptandrus</i> dune community	S2S3	-	-
aspen / creeping juniper / hay sedge woodland	<i>Populus tremuloides</i> / <i>Juniperus horizontalis</i> / <i>Carex siccata</i> woodland	S2S3	-	-
beautiful branch moss	<i>Callicladium haldanianum</i>	S2	-	-
black spruce / red-osier dogwood / feathermoss rich fen	<i>Picea mariana</i> / <i>Cornus stolonifera</i> / feathermoss rich fen	S1S2	-	-
tamarack - black spruce / red-osier dogwood - wild red raspberry rich fen	<i>Larix laricina</i> - <i>Picea mariana</i> / <i>Cornus stolonifera</i> - <i>Rubus idaeus</i> rich fen	S1S2	-	-
salt grass - western wheat grass meadow	<i>Distichlis stricta</i> - <i>Pascopyrum smithii</i> meadow	S2	-	-
Verna's Flower Moth	<i>Schinia verna</i>	S2	Threatened	Threatened
Pale Yellow Dune Moth	<i>Copablepharon grandis</i>	S3	Special Concern	Special Concern
Eastern Dun Skipper	<i>Euphyes vestris metacomet</i>	SU	-	-
balsam poplar / high-bush cranberry / ostrich fern forest	<i>Populus balsamifera</i> / <i>Viburnum opulus</i> / <i>Matteuccia struthiopteris</i> forest	S1S2	-	-
Floating Crystalwort	<i>Riccia fluitans</i>	SU	-	-
blunt-leaved watercress	<i>Rorippa curvipes</i>	S3	-	-
Nevada rush	<i>Juncus nevadensis</i>	S1	-	-
low cinquefoil	<i>Potentilla plattensis</i>	S2	-	-
Alaska birch - white spruce / pussy willow / common horsetail swamp forest	<i>Betula neoalaskana</i> - <i>Picea glauca</i> / <i>Salix discolor</i> / <i>Equisetum arvense</i> swamp forest	S1S2	-	-
dotted ramalina	<i>Ramalina farinacea</i>	S3	-	-
bean-spored rim-lichen	<i>Lecania dubitans</i>	SU	-	-
frosted rim-lichen	<i>Lecanora caesiorubella</i> ssp. <i>saximontana</i>	SU	-	-
hairy pepperwort	<i>Marsilea vestita</i>	S3	-	-
little bluestem - sand grass grassland	<i>Schizachyrium scoparium</i> - <i>Calamovilfa longifolia</i> grassland	S2	-	-
sand dropseed semi-active dune	<i>Sporobolus cryptandrus</i> semi-active dune	S2	-	-
sand grass - needle-and-thread grassland	<i>Calamovilfa longifolia</i> - <i>Hesperostipa comata</i> Grassland	S3	-	-

Common Name	Scientific Name	Provincial Rank ^(a)	COSEWIC ^(b)	SARA ^(b)
Umbilicate Sprite	<i>Promenetus umbilicatellus</i>	SU	-	-
Fragile Ancyloid	<i>Ferrissia fragilis</i>	SU	-	-
Creeping Ancyloid	<i>Ferrissia rivularis</i>	SU	-	-
Bellmouth Rams-horn	<i>Planorbella campanulata</i>	SU	-	-
Western Least Moonwort	<i>Botrychium simplex var. compositum</i>	S2	-	-
wild comfrey	<i>Andersonglossum boreale</i>	S1	-	-
ovate spikerush	<i>Eleocharis ovata</i>	S1	-	-
Pallas' bugseed	<i>Corispermum pallasii</i>	S2	-	-
rough barnyard grass	<i>Echinochloa muricata var. microstachya</i>	S1	-	-
Fremont's goosefoot	<i>Chenopodium fremontii</i>	S2	-	-
spiked lobelia	<i>Lobelia spicata</i>	S1	-	-
glaucous-headed liverwort	<i>Scapania glaucocephala var. glaucocephala</i>	S2S4	-	-
Cavernous Crystalwort	<i>Riccia cavernosa</i>	S2S4	-	-
ascending grape fern	<i>Botrychium ascendens</i>	S3	-	-
pale moonwort	<i>Botrychium pallidum</i>	S2	-	-
Narrow-leaved Moonwort	<i>Botrychium lineare</i>	S1	-	-
western moonwort	<i>Botrychium hesperium</i>	S3	-	-
Jagged Germanderwort	<i>Riccardia chamedryfolia</i>	SU	-	-
cobblestone lichen	<i>Acarospora veronensis</i>	SU	-	-
chiseled sunken disc lichen	<i>Circinaria contorta</i>	SU	-	-
firedot lichen	<i>Caloplaca ahtii</i>	SU	-	-
Donn's grimmia moss	<i>Grimmia donniana</i>	S1S2	-	-
	<i>Hygroamblystegium varium var. varium</i>	S1S2	-	-
rim-lichen	<i>Myriolecis crenulata</i>	SU	-	-
smooth cliffbrake	<i>Pellaea glabella ssp. simplex</i>	S2	-	-
Powder-headed Shadow Lichen	<i>Phaeophyscia nigricans</i>	S2S3	-	-
dark shadow lichen	<i>Phaeophyscia sciastra</i>	S3	-	-
cryptic rosette lichen	<i>Physciella chloantha</i>	SU	-	-
American bugseed	<i>Corispermum americanum var. americanum</i>	S2	-	-

Common Name	Scientific Name	Provincial Rank ^(a)	COSEWIC ^(b)	SARA ^(b)
fi redot lichen	<i>Xanthocarpia lactea</i>	SU	-	-
mortar rim-lichen	<i>Myriolecis dispersa</i>	SU	-	-
Black Rocklicorice Lichen	<i>Lichinella nigritella</i>	SU	-	-
Outward-looking Rosette Lichen	<i>Physcia alnophila</i>	SU	-	-
yellow-edged frost lichen	<i>Physconia enteroxantha</i>	S3	-	-
crescent frost lichen	<i>Physconia perisidiosa</i>	S3	-	-
brown-eyed scale lichen	<i>Psora tuckermanii</i>	S2S3	-	-
speck lichen	<i>Verrucaria muralis</i>	SU	-	-
bright cobblestone lichen	<i>Acarospora socialis</i>	SU	-	-
orange fi redot lichen	<i>Caloplaca decipiens</i>	SU	-	-
fi redot lichen	<i>Caloplaca pyracea</i>	SU	-	-
fi redot lichen	<i>Caloplaca subsoluta</i>	SU	-	-
variable orange lichen	<i>Caloplaca variabilis</i>	SU	-	-
goldspeck lichen	<i>Candelariella rosulans</i>	SU	-	-
Flowers' rim lichen	<i>Lecanora flowersiana</i>	SU	-	-
disk lichen	<i>Lecidella latypiza</i>	SU	-	-
pepper-spore lichen	<i>Rinodina castanomelodes</i>	SU	-	-
orange foliose lichen	<i>Xanthomendoza mendozae</i>	SU	-	-
Hooker's bugseed	<i>Corispermum hookeri</i> var. <i>hookeri</i>	S2	-	-
	<i>Porpidia zeoroides</i>	SU	-	-
alkaline wing-nerved moss	<i>Pterygoneurum kozlovii</i>	S2	-	-
silverberry / plains rough fescue	<i>Elaeagnus commutata</i> / <i>Festuca hallii</i>	S2S3	-	-
tumble grass	<i>Schedonnardus paniculatus</i>	S2	-	-
silverberry - chokecherry / hay sedge shrubland	<i>Elaeagnus commutata</i> - <i>Prunus virginiana</i> / <i>Carex siccata</i> shrubland	S2S3	-	-
narrow-winged water-starwort	<i>Callitriche stenoptera</i>	SU	-	-
scratch grass - Nevada bulrush - salt grass meadow	<i>Muhlenbergia asperifolia</i> - <i>Amphiscirpus nevadensis</i> - <i>Distichlis stricta</i> meadow	S1S2	-	-
giant bur-reed emergent aquatic vegetation	<i>Sparganium eurycarpum</i> emergent aquatic vegetation	S1S2	-	-

Common Name	Scientific Name	Provincial Rank ^(a)	COSEWIC ^(b)	SARA ^(b)
foxtail muhly	<i>Muhlenbergia andina</i>	S1S2	-	-
narrowleaf umbrellawort	<i>Mirabilis linearis</i>	S2	-	-
Twelve-spotted Skimmer	<i>Libellula pulchella</i>	S1S2	-	-
limp Pacific woodrush	<i>Luzula comosa var. laxa</i>	SU	-	-

(a) Provincial conservation ranking definitions (ACIMS 2018):

S1: Known from five or fewer occurrences or especially vulnerable to extirpation because of other factor(s).

S2: Known from twenty or fewer occurrences or vulnerable to extirpation because of other factors.

S3: Known from 100 or fewer occurrences, or somewhat vulnerable due to other factors, such as restricted range, relatively small population sizes or other factors.

S4: Apparently secure, taxon is uncommon but not rare and potentially some cause for long term concern due to decline or other factors.

S#S#: A numeric range rank is used to indicate any range of uncertainty about the status of the taxon

SU: Taxon is currently unrankable due to lack of information or substantially conflicting information.

(b) COSEWIC and SARA status designations (GC 2022):

Threatened: A species that is likely to become endangered if nothing is done to reserve the factors leading to its extirpation or extinction.

Special Concern: A species that may become threatened or endangered of a combination of biological characteristics and identified threats.

REFERENCES

- ACIMS (Alberta Conservation Information Management System). 2018. Species Conservation Ranks. [accessed February 2023]. <https://www.albertaparks.ca/albertaparksca/management-land-use/alberta-conservation-information-management-system-acims/tracking-watch-lists/species-conservation-ranks/>.
- GC (Government of Canada). 2022. Species at Risk Public Registry. [accessed March 2023]. <https://www.canada.ca/en/environment-climate-change/services/species-risk-public-registry.html>.

APPENDIX J

Representative Wetland Photographs



Photo 1: W139 – Example of a Natural Drainage in the LOD



Photo 2: W0024 – Example of an Ephemeral Waterbody in the LOD



Photo 3: W2283 – Example of a Temporary Graminoid Marsh (M-G [II]) in the LOD



Photo 4: W2142 – Example of a Seasonal Graminoid Marsh (M-G [III]) in the LOD



Photo 5: W1068 – Example of a Semi-Permanent Graminoid Marsh (M-G [IV]) in the LOD



Photo 6: W2045- Example of a Temporary Shrubby Swamp (S-S [II]) in the LOD



Photo 7: W2107A – Example of a Seasonal Shrubby Swamp (S-S [III]) in the LOD

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APPENDIX G

Water Act Approval –
Permanently Impacted Wetlands



APPROVAL
PROVINCE OF ALBERTA
Water Act, RSA 2000, c.W-3, as amended

APPROVAL NUMBER: DAUT0012446
EFFECTIVE DATE: 2023-06-06
EXPIRY DATE: 2028-07-01
ACTIVITY LOCATION: SW-25-39-14-W4, NW, S1/2-33-39-14-W4, NE-2-40-15-W4, W1/2-34-39-14-W4, NE-4-40-15-W4, SW-35-39-15-W4, SE-9-40-15-W4, ,
APPROVAL HOLDER: Capital Power Generation Services Inc

Pursuant to the Water Act, R.S.A. 2000, c. W-3, as amended, an Approval is issued to the Approval Holder to commence, continue, discontinue the following activities:

- placing, constructing, operating, maintaining, removing, disturbing works, in or on any land, water or water body;
- maintaining, removing or disturbing ground, vegetation or other material in or on any land, water or water body;

("the Activity")

Designated Director under the Water Act: *Todd Aasen*

Date Signed: 2023-06-06



TERMS AND CONDITIONS

1. DEFINITIONS

5050. All definitions from the Act and the Regulations apply except where expressly defined in this approval.

5060. In all parts of this Approval:

- a. "Act" means the Water Act, RSA 2000, c. W-3, as amended;
- b. "Application" means the written submissions to the Director in respect of application number DAPP0038741 and any subsequent applications for amendments of Approval Number DAUT0012446;
- c. "Director" means an employee of the Government of Alberta designated as a Director under the Act;
- d. "Maintenance" means the routine repair, upkeep and preservation of the activity authorized under this Approval;
- e. "Minimization of wetland impacts" means reducing negative impacts on wetlands as described in the Alberta Wetland Policy, Alberta Government, September 2013, as amended;
- f. "Regulations" means the regulations, as amended, enacted under the authority of the Act.

2. GENERAL

5200. The Approval Holder shall immediately report to the Director by telephone, any contravention of the terms and conditions of this approval at 1-780-422-4505.

5210. The terms and conditions of this Approval are severable. If any term or condition of this Approval is held invalid, the application of such term or condition to other circumstances and the remainder of this Approval shall not be affected thereby.

5220. The Approval Holder shall not deposit or cause to be deposited any substance in, on, or around the water body that has, or may have, the potential to adversely affect the water body.

5230. The Approval Holder shall retain a copy of this Approval at the site of the activity.

3. PARTICULARS

5240. This Approval is appurtenant to the placement and maintenance of fill in a wetland located in



SW-25-39-14-W4, NW, S1/2-33-39-14-W4, NE-2-40-15-W4, W1/2-34-39-14-W4, NE-4-40-15-W4, SW-35-39-15-W4, SE-9-40-15-W4, as specified in 5250.

5250. The Approval Holder shall only undertake the Activity in accordance with the application and the following plan(s) and report(s):

DAPP0038741-R001 Capital Power Halkirk 2 Project. Dated: March 2, 2023. Prepared by: WSP Canada Inc., specifically the following sections:

- Figures 2-A, 2-B, 2-C, 2-D, 2-E, 2-F Wetland and Waterbody Locations and Delineations in the Halkirk
2 Project (pgs. 8-13 of pdf)
- Section 4.3 Minimization Proposal

5260. The Approval Holder shall retain a copy of the report(s) and plan(s) referred to in 5250 at the site of the Activity at all times while conducting the Activity.

5270. The Approval Holder shall not undertake the Activity in any manner or use any material that causes or may cause an adverse effect on the aquatic environment, human health, property or public safety.

5341. The Approval Holder shall ensure a Qualified Wildlife Biologist:
(a) sweeps the area for wildlife presence, nesting sites, breeding grounds within 7 days prior to construction and;
(b) if nesting of migratory birds are observed, the Approval Holder shall undertake the actions recommended by a Qualified Wildlife Biologist.

5342. The Approval Holder shall ensure reclamation, including, but not limited to debris disposal, cleanup, slope/bank and topsoil stabilization or replacement and reseeding, shall be done in conjunction with the construction activities.

4. WETLAND MINIMIZATION

5550. The Approval Holder shall implement minimization of wetland impacts, as specified in 5250.

5. SILTATION AND EROSION CONTROL

5480. The Approval Holder shall not do or permit anything to be done, nor omit or permit any omissions, which causes or may cause an adverse effect related to:
(a) siltation; or
(b) erosion
as a result of the activity.

6. COMPLAINTS

6000. The Approval Holder shall:

(a) make reasonable efforts to obtain further information regarding complaints of surface water and groundwater interference as a result of the Activity; and

(b) prepare a written report describing the steps taken to comply with (a) including, at a minimum, each of the following:

(b)(i) a detailed description of the efforts taken by the Approval Holder to obtain further information regarding the complaints as required in (a);

(b)(ii) all of the information obtained by the Approval Holder as result of the efforts required in (a);

(b)(iii) recommendations for measures to remediate and mitigate the interference(s) with surface water and groundwater as a result of the Activity;

(b)(iv) detailed information describing how the Approval Holder will implement the measures recommended in (i);

(b)(v) a schedule of implementation for the measures recommended in (i); and

(b)(vi) any other information required in writing by the Director.

6010. Within 30 days of the receipt of the complaint, the Approval Holder shall submit the written report in 6000(b) to the Director.

6020. If the written report in 6000(b) is found deficient by the Director, the Approval Holder shall correct all the deficiencies identified by the Director by the date specified in writing by the Director.

6030. The Approval Holder shall implement the measures in 6000(b) as approved in writing by the Director.

7. CERTIFICATE OF COMPLETION

6040. A Certificate of Completion is not required for this activity.



REPORT

Capital Power Halkirk 2 Project
Wetland Assessment and Impact Report

Submitted to:

Alberta Environment and Protected Areas

9915 - 108 St. NW
Edmonton, AB T5K 2G6

Submitted by:

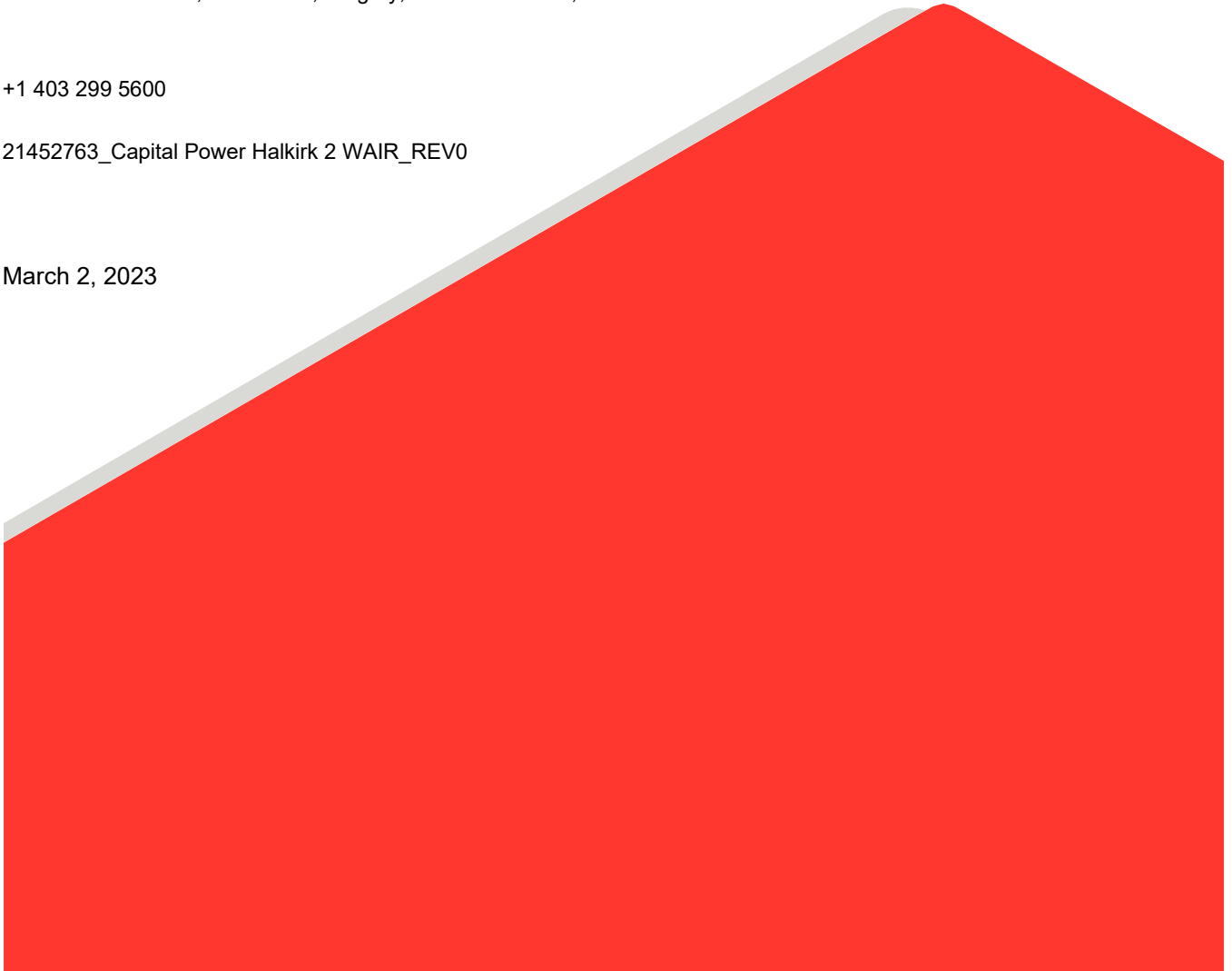
WSP Canada Inc.

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March 2, 2023



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1.0 INTRODUCTION

Capital Power (Halkirk 2) L.P. by its general partner Capital Power Generation Services Inc. (Capital Power), retained WSP Canada Inc. (WSP) to provide wetland assessment and permitting support for the proposed Halkirk 2 Wind Power Project (the Project) located in Alberta's Paintearth County (County), approximately 12 km northeast of Halkirk, Alberta (Figure 1).

The Project layout included in the Environmental Evaluation (WSP Golder 2022; AUC Proceeding 27691) was based on a total installed nameplate capacity of 151 megawatts (MW) for delivery to the Alberta Interconnected Electric System (AIES). The Project consists of both permanent and temporary footprints. The Project's temporary footprint (construction footprint) is required only during the construction period to install permanent infrastructure and includes the following:

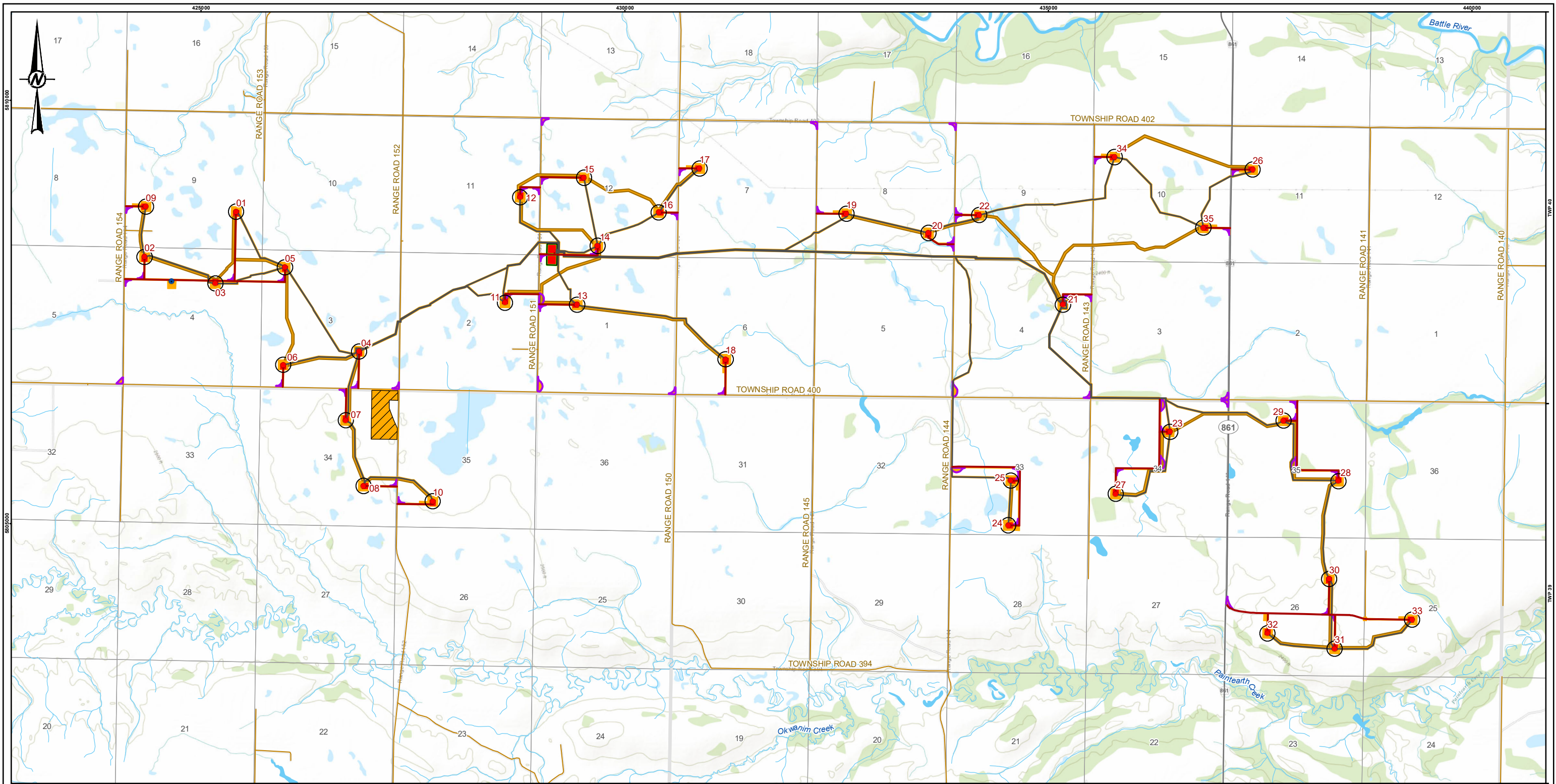
- temporary workspace for the storage of equipment or materials in a temporary laydown area;
- temporary work area around the turbine locations for the assembly and installation of turbines;
- temporary crane paths;
- temporary right-of-way (ROW) for the installation of underground collector lines; and
- temporary work areas adjacent to access roads and upgrades to existing public roads for construction access purposes.

The proposed permanent (i.e., 30 years) Project footprint, herein referred to as the Project Operational Footprint (POF) will include:

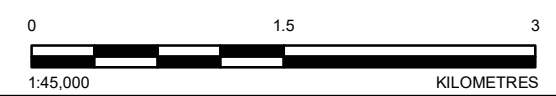
- wind turbine generators (turbines) and associated foundation or "pad" sites (turbine locations);
- access roads;
- a Project substation including an operation and maintenance (O&M) building; and
- one permanent meteorological (MET) tower.

The wetlands delineations intersecting the POF are provided in Figure 2-A:. The Project's POF has the potential to impact six ephemeral waterbodies (W2004, W2272, W2398, W2539, W2640, W2641), one drainage channel (W0139), six temporary graminoid marshes (M-G-II) (W0098, W1362a, W1362b, W139a, W2276, W2283), and four seasonal graminoid marshes (permanence-G-III) (W2142, W2245, W2343, W2348). The ephemeral and drainage waterbodies impacted by the Project's permanent infrastructure will be discussed in Appendix A of this report but are not subject to replacement costs under the *Alberta Wetland Policy* (GOA 2013). Separate *Water Act* notifications under a Wetland Assessment and Impact Form (WAIF) will be prepared for ephemeral waterbody crossings and wetland impacts from the temporary (construction) footprint.

This report presents the Wetland Assessment and Impact Report (WAIR) that will accompany an application for approval under section 37 of the *Water Act* (GOA 2000a) for the Project's permanent footprint activities that will impact wetlands. This WAIR was prepared in compliance with the *Alberta Water Act*, the *Alberta Wetland Policy* directives, guides, and assessment tools (GOA 2000a, 2013, 2015a, b, c, d; 2018) and the *Alberta Wetland Assessment and Impact Report Directive* (GOA 2017).



- LEGEND**
- SECONDARY HIGHWAY
 - LOCAL ROAD
 - WATERCOURSE
 - WATERBODY
 - ROTOR-SWEPT AREA
 - PROJECT FOOTPRINT**
 - METEOROLOGICAL TOWER
 - TURBINE
 - UNDERGROUND COLLECTOR SYSTEM
 - OPERATIONAL ROAD
 - CRANE PATH
 - INTERSECTION IMPROVEMENT
 - SUBSTATION
 - ▨ TEMPORARY LAYDOWN
 - OPERATION FOOTPRINT
 - CONSTRUCTION FOOTPRINT



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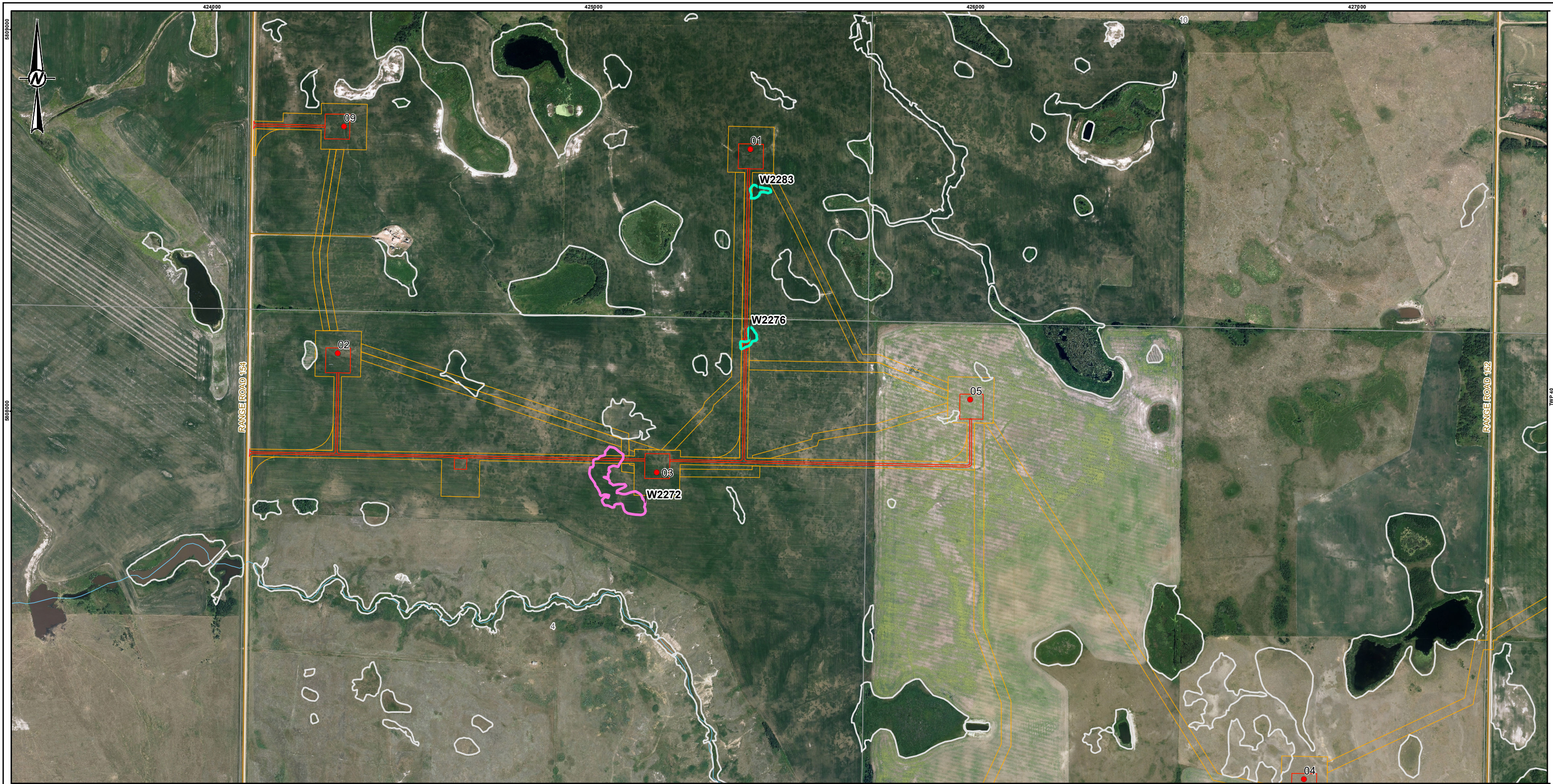
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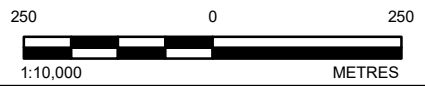
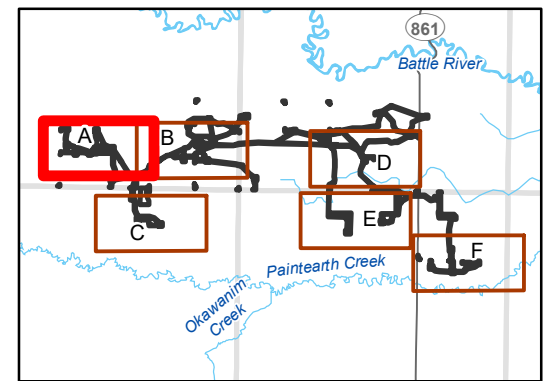
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 - SECONDARY HIGHWAY
 - LOCAL ROAD
 - RAILROAD
 - WATERCOURSE
- PROJECT LAYOUT**
- TURBINE
 - OPERATION FOOTPRINT (PERMANENT IMPACTS)
 - CONSTRUCTION FOOTPRINT (TEMPORARY IMPACTS)
- WETLAND**
- WETLAND CLASSES - PERMANENT IMPACT**
- EPHEMERAL WATERBODY
 - TEMPORARY GRAMINOID MARSH (M-G-II)
 - SEASONAL GRAMINOID MARSH (M-G-III)
 - NATURAL DRAINAGE



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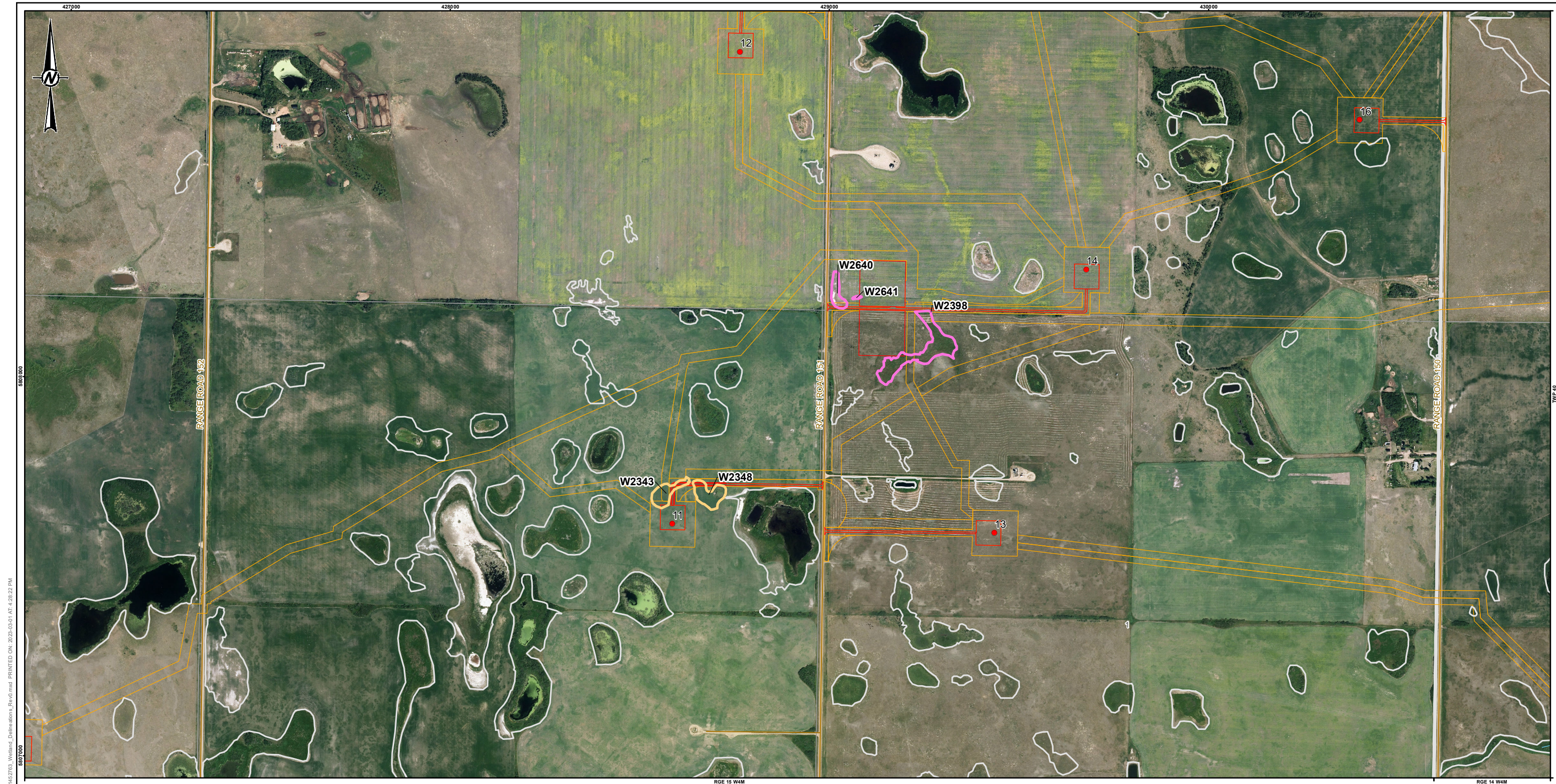
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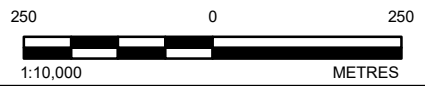
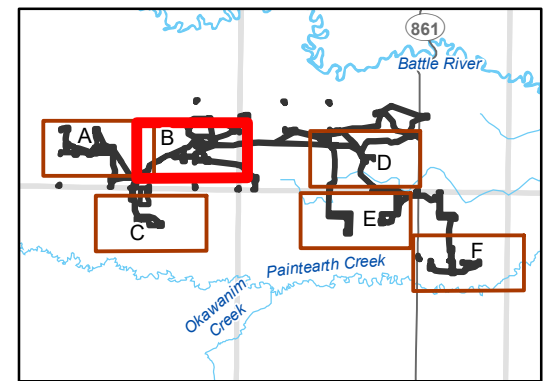


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 - ▭ CONSTRUCTION FOOTPRINT (TEMPORARY IMPACTS)

- WETLAND**
- ▭ WETLAND
 - ▭ WETLAND CLASSES - PERMANENT IMPACT
 - ▭ EPHEMERAL WATERBODY
 - ▭ TEMPORARY GRAMINOID MARSH (M-G-II)
 - ▭ SEASONAL GRAMINOID MARSH (M-G-III)
 - ▭ NATURAL DRAINAGE



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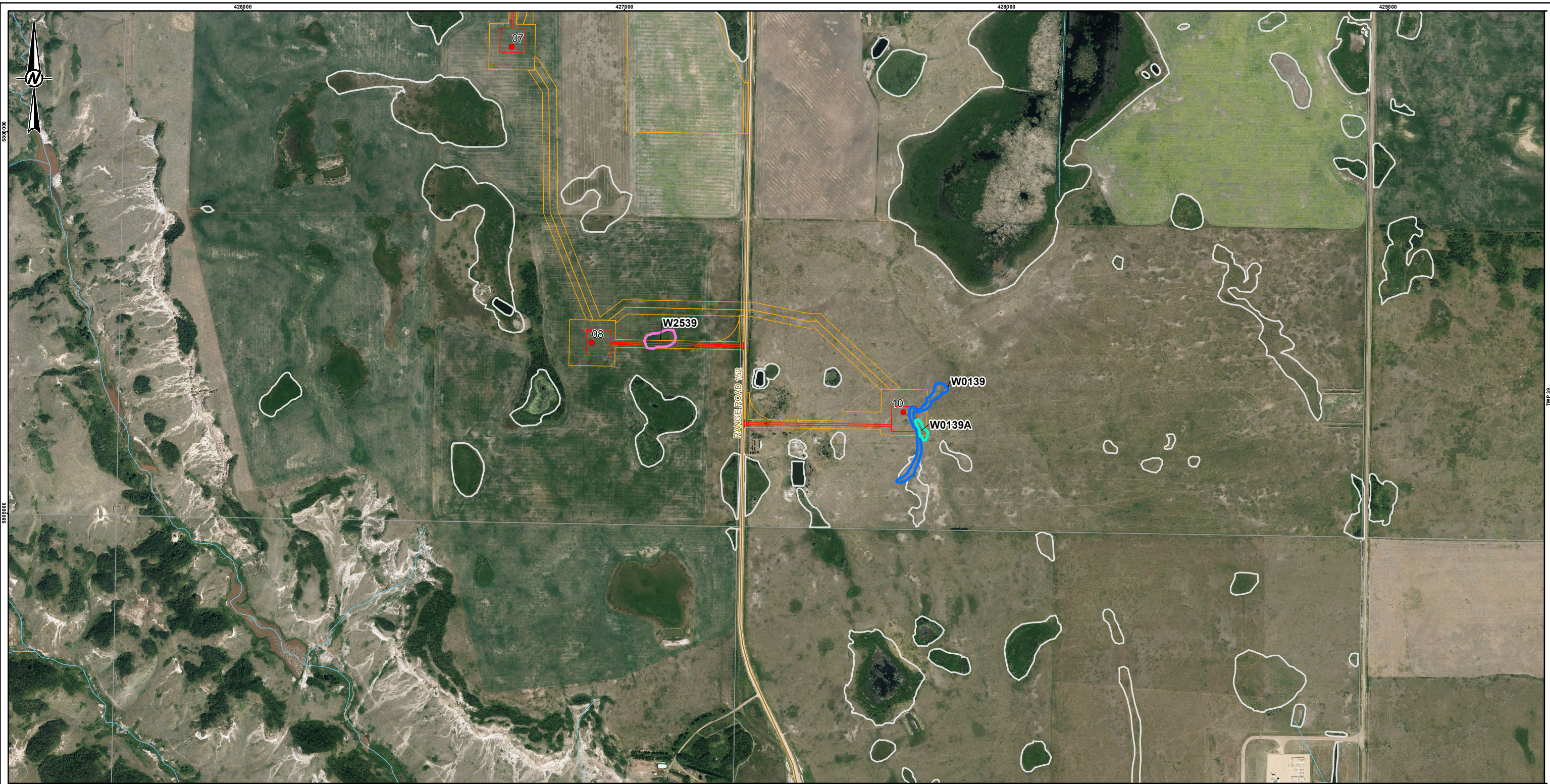
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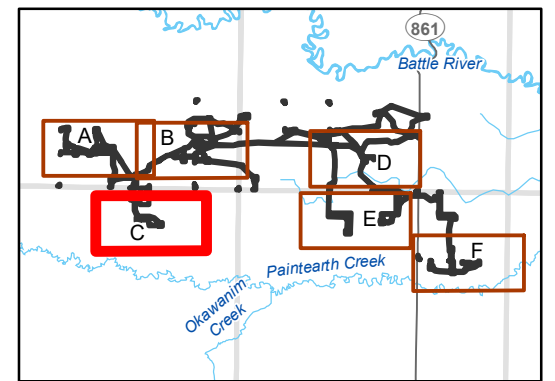
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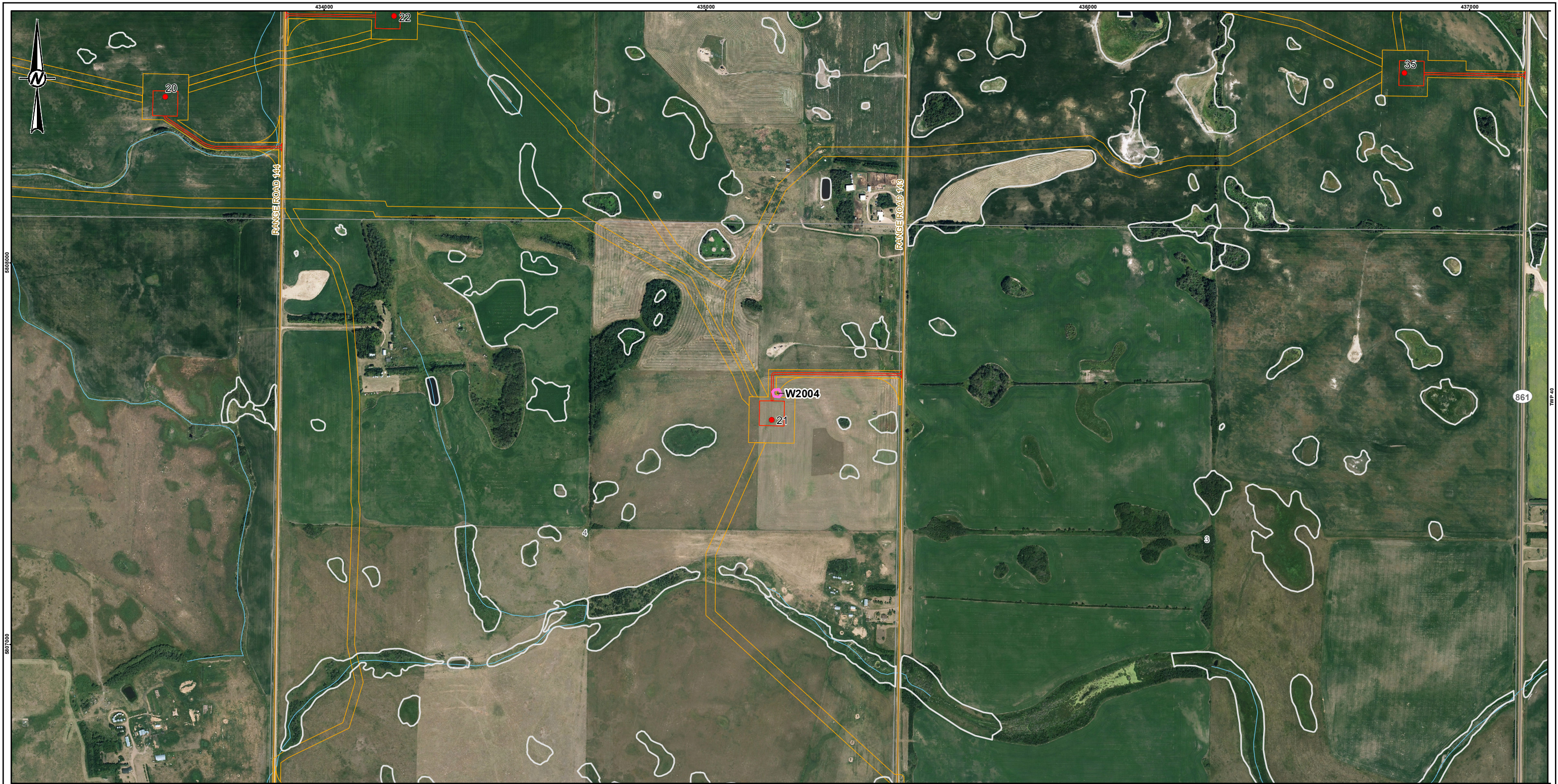
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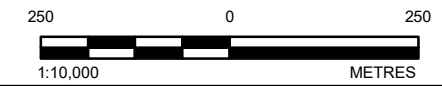
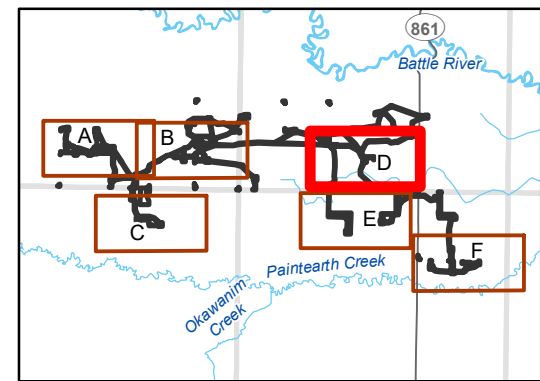
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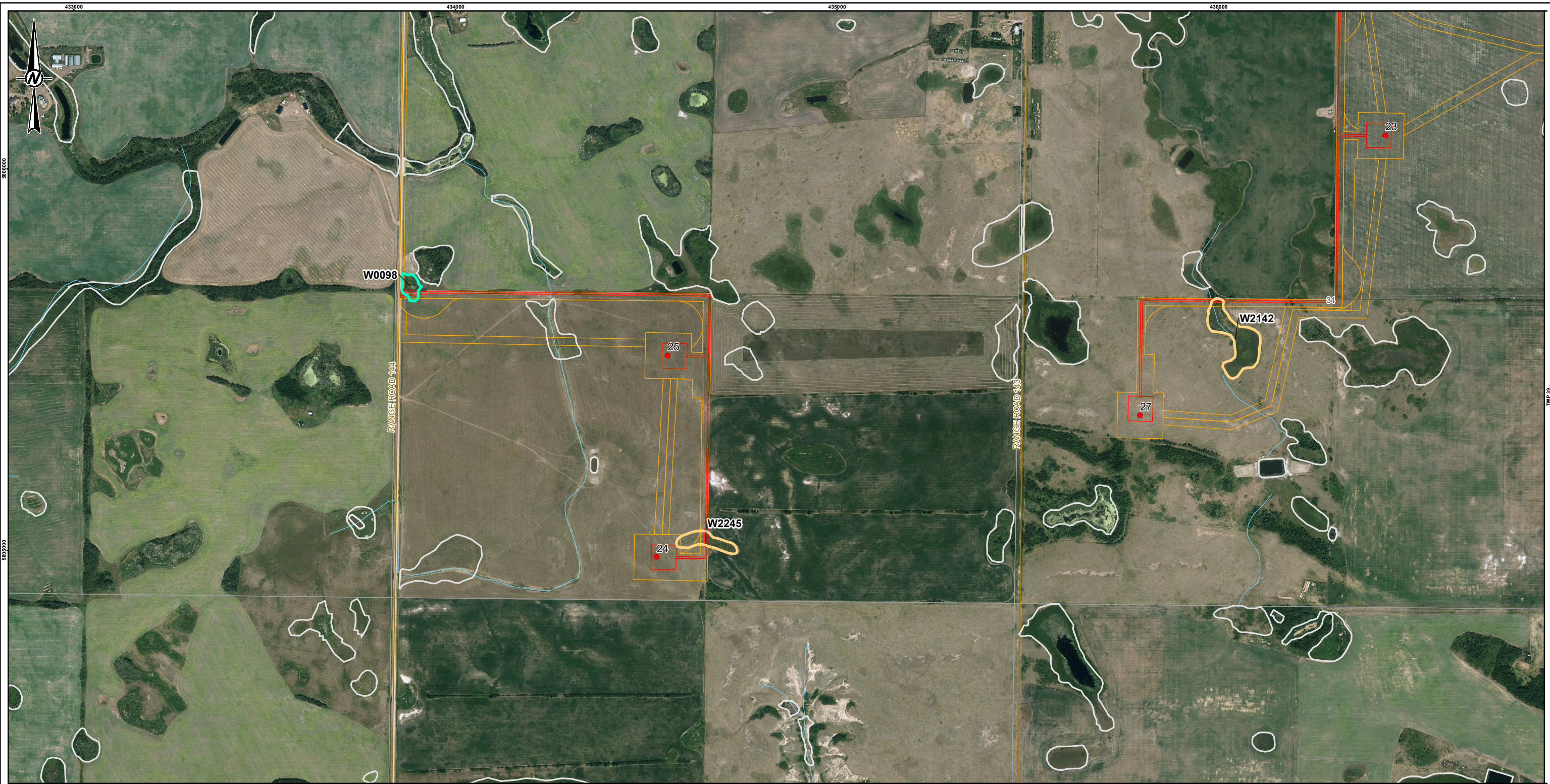
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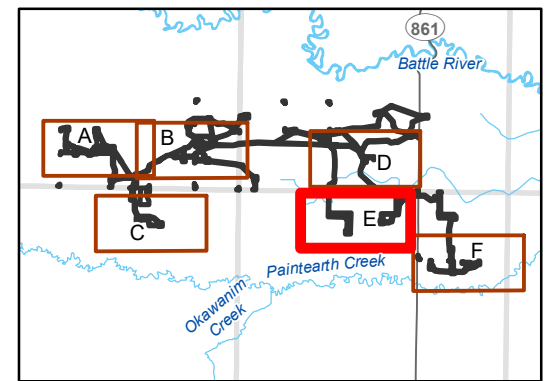
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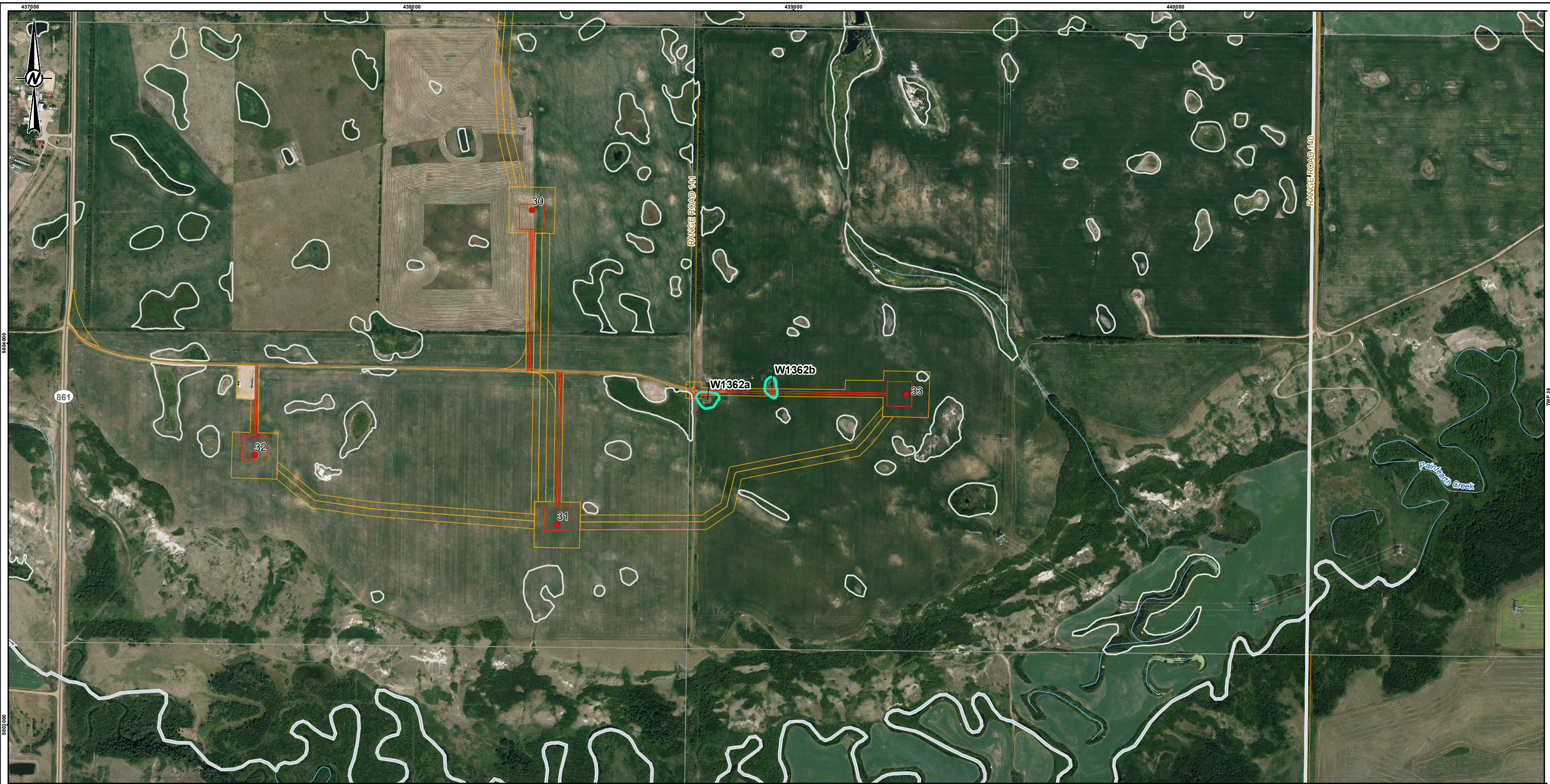
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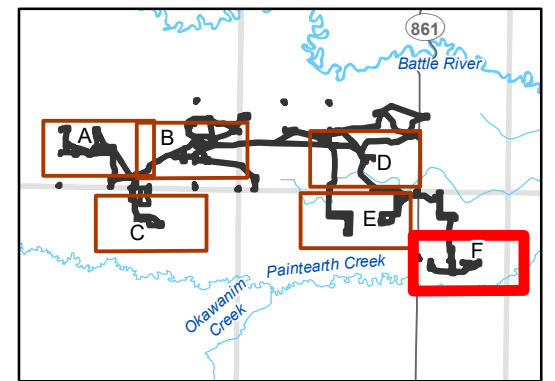
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2.0 ASSESSMENT METHODS

WSP completed a desktop and field assessment of the wetlands intersecting the POF following directives and guidelines outlined under the *Alberta Wetland Policy* (GOA 2013; 2015a, b, c; 2017, 2018). Wetland delineation was completed utilizing Pathway 5 (Comprehensive desktop delineation with field verification) of the *Alberta Wetland Identification and Delineation Directive* (Figure 2-A.; GOA 2015a), which is used for sites with complex/indistinct wetland boundaries, insufficient wetland indicators, high disturbance, and available imagery. Due to the presence of high disturbance from agricultural practices within the site, delineation required historic imagery review.

2.1 Desktop Review

2.1.1 Desktop Searches

A desktop assessment of the natural and anthropogenic landscape features in the local watershed for the wetlands was completed before performing the field survey. A desktop review for special designations or environmental sensitivities within the Project layout (Figure 1) was completed using the following resources:

- The Historical Resource Value (GOA 2022a) was assessed to determine whether historical resources were present or if there is a high potential for their presence, including archaeological, paleontological, historical, natural, and cultural resources.
- The GOA's Authorization Viewer (GOA 2021) was searched for existing and historical EPEA approvals and Water Act Licenses and Approvals.
- The Alberta Conservation Information Management System (ACIMS) online database (AEP 2022) was searched for historical occurrences of listed provincial plant species or sensitive ecological communities.
- The Fish and Wildlife Management Information System (FWMIS) (GOA 2023a) was queried for historical occurrences of listed fish and wildlife species.
- The Landscape Analysis Tool (LAT) Report (GOA 2023b) was referenced to determine if any layers (e.g., key wildlife and biodiversity zones, special access zones, locations of sensitive wildlife, and/or vegetation features) intersect the Project layout.

2.1.2 Desktop Wetland Delineation

A desktop interpretation of historical and recent aerial photographs was completed in conjunction with a review of topographic maps to delineate wetland boundaries and to assess drainage patterns, watersheds, and catchment areas.

Wetlands were delineated through the interpretation of stereo aerial imagery by a WSP biologist using softcopy technology at a scale of 1:15,000. Softcopy mapping incorporates the functionality of both geographical information system (e.g., ArcGIS) and PurVIEW® software, where hardcopy aerial photographs at scales of 1:20,000 or 1:30,000 were scanned at 10 to 15 microns and merged with provincial digital elevation model (DEM) data to create digital files that were viewed in 3D on a computer monitor with the aid of specialized glasses. Using this system, a WSP biologist interpreted the imagery (i.e., delineated individual polygons based on moisture and nutrient regime, and vegetation signatures) and classified the wetland as defined in the Alberta Wetland Classification System (AWCS) (GOA 2015c).

2.1.2.1 Historical Aerial Photograph Review

A historical aerial photograph review of the wetlands was completed by obtaining aerial photographs for selected years from AEP's Aerial Photographic Record System (GOA 2023c) and Google Earth. Aerial photographs from 1950 to present were reviewed, and successive photos were acquired based on historic precipitation data, clarity and to show changes in vegetation patterns and wetland boundaries over approximately 10-year intervals, as available. Six years of aerial photographs, including, 1950, 1963, 1970, 1980, 1993, and 2009 were selected for review. Historical photographs and associated historical wetland boundary delineations are included in Appendix B.

2.2 Wetland Field Survey

ABWRET-A assessments for the wetlands being permanently impacted by the POF were conducted by Derek Rennie (P.Biol.), Brendan Bischoff and Liz Morrison (P.Biol.) working under the supervision of Kelli Warren, a Vegetation and Wetland Ecologist and Wetland Authenticating Professional (P.Biol.), on August 27, 28, 30, and September 1, 14, and 25, 2022. Field surveys met the requirement of Section 1.2 of the *Alberta Wetland Assessment and Impact Report Directive* (GOA 2017), which states, "The field portion of a WAIR must be completed within the growing season when vegetation is growing above-ground and can be easily observed." The vegetation at the time of the field surveys was apparent above ground and was observable and identifiable during the field surveys.

Using a Global Positioning System (GPS), a track file was recorded to delineate the wetland perimeters and generate area summaries using a Geographical Information System (GIS). Additionally, the Alberta Wetland Rapid Evaluation Tool – Actual (ABWRET-A) survey was completed in accordance with the ABWRET-A manual (GOA 2015d) for the Parkland-Grassland Natural Regions.

Wetland soil characteristics were identified during the survey; conductivity and pH were not recorded as standing water was not present at the time of the survey. Plants were identified to species, if possible, and distinct vegetation zones were noted by the presence of dominant plant species or communities. Weeds, listed plant, and wildlife species observations were also recorded as encountered. Detailed notes were taken on the topography, surficial connectivity of wetlands and water flow, and surrounding land use. Photographs were taken during the field surveys and are provided in Appendix C.

2.3 Wetland Post-Field Desktop Assessment

Following the field survey, the wetland delineation was adjusted as required based on current and historical imagery, field verification notes, and topographic maps. Final wetland classification to AWCS (GOA 2015c) class, form and permanence was completed in the office and considered vegetation species present, topographical position, soil conditions and comparison of historical aerial photographs (Appendix B). Revised wetland delineations and the ABWRET-A form were submitted to Alberta Environment and Protected Areas (AEPA) on December 23, 2023, to determine the relative wetland value of assessed wetlands, W0098, W0139A, W1362a, W1362b, W2142, W2245, W2276, W2283, W2343, and W2348.

3.0 ASSESSMENT RESULTS

3.1 Desktop Assessment

3.1.1 Desktop Searches

The Project occurs in the North Saskatchewan River Basin watershed (North Saskatchewan River Basin Council 2023). The Battle River and Sounding Creek watersheds are sub-basins of this watershed. The Battle River watershed is a tributary of the North Saskatchewan River, covering over 25,000 km² and located entirely within the White Zone in Alberta. The Battle River traverses central Alberta and extends to east Saskatchewan, where it flows into the North Saskatchewan River at Battleford, Saskatchewan.

The Project falls in the Central Parkland Natural Subregion of the Parkland Natural Region (NRC 2006). Only about 5% of the Central Parkland Natural Subregion remains as native vegetation. These native areas are characterized by plains rough fescue prairie, with clumps of aspen within moist sites in the south and east. With higher precipitation to the north and west, closed aspen (*Populus tremuloides*) forests occur with small grassland patches (NRC 2006). Native areas are generally dominated by plains rough fescue (*Festuca hallii*), slender wheat grass (*Elymus trachycaulus*), western porcupine grass (*Hesperostipa curtisetata*), June grass (*Koeleria macrantha*), needle-and-thread (*Hesperostipa comata*), and blue grama (*Bouteloua gracilis*) (NRC 2006). Shrub communities typically only occur in moderately well drained sites in moister locations. Shrub communities in these areas typically consist of buckbrush (*Symphoricarpos occidentalis*), silverberry (*Elaeagnus commutata*), prickly rose (*Rosa acicularis*), chokecherry (*Prunus virginiana*), and saskatoon (*Amelanchier alnifolia*) (NRC 2006). Aspen communities vary based on parent material and moisture. In the southeast, they are restricted to imperfectly drained depressions, as precipitation increases to the north and west, they become dominant (NRC 2006).

The ATS locations, Sec 4-Twp 40-Rge 15-Mer 4, Sec 25-Twp 39-Rge 14-Mer 4, and Sec 26-Twp 39-Rge 14-Mer 4 in the Project layout appears in the *Listing of Historic Resources* under the Alberta *Historical Resources Act* (GOA 2022a). These locations have a Historic Resource Value (HRV) listing of 5 with high paleontological resource sensitivity zones and high archaeological resource sensitivity zone. HRVs range from 1 to 5 with HRV 1 having the highest level of protection (GOA 2022b). Most types of projects require approval under the *Historic Resources Act* and projects that require approval by the Alberta Utilities Commission (AUC) always require submission of a Historic Resources Application (GOA 2022c). Therefore, a Historic Resources Application for the Project (Application No. 22650871) was submitted on June 1, 2022, for the Project and a *Historical Resources Act* Approval (HRA No. 4941-16-0008-003) was received on June 22, 2022.

Four existing and four historical EPEA approvals and *Water Act* Licenses and Approvals, were identified using GOA's Authorization Viewer (GOA 2021) within sections of land overlapping with the Project (Appendix D):

- NW 33-39-14 W4M:
 - One existing Water Resources Act licence, held by Howard Jackson.
 - One existing EPEA Approval, a reclamation certificate held by Husky Oil Operations Limited.
 - One historical Code of Practice for Watercourse Crossing under the provisions of the *Water Act*, held by ALTALINK Management Ltd.
- NE 02-40-15 W4M:
 - One existing Registration under the provisions of the *Water Act*, held by Lloyd Erion.

- NE 04-40-15 W4M:
 - No results from GOA’s Authorization Viewer (GOA 2021).
- SE 09-40-15 W4M:
 - No results from GOA’s Authorization Viewer (GOA 2021).
- SW 25-39-14 W4M:
 - Three historical Code of Practice for Watercourse Crossing under the provisions of the *Water Act*, held by ATCO Electric Ltd.
- SW 34-39-14 W4M:
 - One existing Registration under the provisions of the *Water Act*, held by Lloyd Erion.

An ACIMS database search was completed on January 25, 2023 (AEP 2022) to help determine the potential for listed plant species historically documented in the Project. The query boundaries were defined as Twp 39-Rge 14-W4M, Twp 39-Rge 15-W4M, Twp 40-Rge 14-W4M, and Twp 40-Rge 15-W4M (Appendix D). The search result for Twp 39-Rge 14-W4M indicated a listing in Section 4 for clammy hedge-hyssop (*Gratiola neglecta*), which has a provincial ranking of S3 (AEP 2018). A conservation status rank of S3 is defined as, “known from 100 or fewer occurrences, or somewhat vulnerable due to other factors, such as restricted range, relatively small population sizes or other factors”. The results of the ACIMS database search does not preclude the potential for other listed plant species to be present within the wetlands, and it is important to note that the absence of historical listed species observations within the POF does not indicate listed species are not present in this area but may be an indication that few inventories have been completed.

A search of the FWMIS database (GOA 2023a) was completed on September 30, 2022, to determine historical observation and occurrences of wildlife and fish species (Appendix D). The Project layout was used to define the boundaries for the FWMIS search. The following species were listed:

Table 1: Wildlife Species with their respective provincial and federal status within the Project layout

Common Name	Scientific Name	GOA Status ^(a)	COSEWIC ^(b)	SARA, Schedule ^(a, c)
American Kestrel	<i>Falco sparverius</i>	Sensitive	-	-
American White Pelican	<i>Pelecanus erythrorhynchos</i>	Sensitive	Not at Risk	-
American Badger	<i>Taxidea taxus</i>	Sensitive	Non-active	-
Bald Eagle	<i>Haliaeetus leucocephalus</i>	Sensitive	Not at Risk	-
Baltimore Oriole	<i>Icterus galbula</i>	Sensitive	-	-
Barn Swallow	<i>Hirundo rustica</i>	May Be at Risk	Special Concern	Threatened
Black Tern	<i>Chlidonias niger</i>	Sensitive	Not at Risk	-
Bobolink	<i>Dolichonyx oryzivorus</i>	Sensitive	Special Concern	Threatened
Eastern Kingbird	<i>Tyrannus tyrannus</i>	Sensitive	-	-
Golden Eagle	<i>Aquila chrysaetos</i>	Sensitive	Not at Risk	-

Table 1: Wildlife Species with their respective provincial and federal status within the Project layout

Common Name	Scientific Name	GOA Status ^(a)	COSEWIC ^(b)	SARA, Schedule ^(a, c)
Great Blue Heron	<i>Ardea herodias</i>	Sensitive	Non-active	Special Concern
Great Gray Owl	<i>Strix nebulosa</i>	Sensitive	Not at Risk	-
Little Brown Bat	<i>Myotis lucifugus</i>	May Be at Risk	Endangered	Endangered
Loggerhead Shrike	<i>Lanius ludovicianus</i>	Sensitive	Non-Active	-
Red Bat	<i>Lasiurus borealis</i>	Sensitive	-	-
Sandhill Crane	<i>Grus canadensis</i>	Sensitive	Not at Risk	-
Short-eared Owl	<i>Asio flammeus</i>	May be at Risk	Threatened	Special Concern
Silver-haired Bat	<i>Lasionycteris noctivagans</i>	Sensitive	-	-
Sora	<i>Porzana carolina</i>	Sensitive	-	-

- a) GOA (2020)
- b) GC (2023)
- c) GC (2023)

The Project layout falls within the Sensitive Raptor Range for prairie falcon (*Falco mexicanus*) and is also within the sharp-tailed grouse (*Tympanuchus phasianellus*) range. It does not fall within any mapped Key Wildlife Biodiversity Zones (GOA 2023b).

3.1.2 Historical Aerial Photograph Review

Six historical aerial photographs from 1950, 1963, 1970, 1980, 1993 and 2009 imagery were reviewed to assess changes to wetlands W0098, W1362A, W1362B, W139A, W2142, W2245, W2276, W2283, W2343, and W2348, and were compared against precipitation data for these time periods (Figure 4, Appendix B, and Appendix F). Since 1950, all wetlands have been impacted by agricultural land usage. Wetlands were generally well defined in the aerial photographs from 1950 to 2009, except for W0098 (1963), W1362b (1963, 1980), W139a (1963, 1993), and W1362a (1970, 1993) (Appendix B, Appendix F). Wetland boundaries were more difficult to distinguish from adjacent vegetation in the year 1963 compared to other years. For the most part, wetlands remained similar in size between years. Wetlands W1362b and W2276 changed sizes the most amongst years. W1362b decreased in size in 1950, and 1963, then increased in size between 1970 to 1993. W2276 increased in size in 1950 and 1963, then decreased in 1970 and 1980, then increased again in 1993.

Additionally, some wetlands appeared bigger in some years, such as W2348 in 1950, W0098 in 1970, and wetlands, W0098 and W2283 in 1980.

Seasonal permanence was observed in W2142, W2245, W2343 and W2348, and these wetlands appeared to be inundated with water in 1950. W2142 also appeared to be inundated with water in 1970 (Appendix B, Appendix F). Temporary permanence was observed in W0098, W1362a, W1362b, W139a, W2276, and W2283. Of these wetlands, W0098, W1362b and W139a have years of ephemeral permanence where the wetland cannot be observed in imagery and ultimately increase to temporary permanence in current delineations (Appendix B, Appendix F).

Wetland 1362a was not evident between years 1963 to 2009 as there appeared to have been a residential farm building. It is likely that this building was removed sometime after 2009 leading to the development of a wetland. Wetlands 2343 and 2348 were mapped as a wetland complex between years 1950 and 1993.

Wetlands generally appeared as discrete wetlands. However, wetlands W2343 and W2348 appeared to drain towards the east in 1993, and wetland W2142 appeared to drain towards the northwest in 1993. Additionally, W139a is part of a drainage that drains towards the northeast in 1950 and 2009.

Of the ten wetlands assessed, six of them were classified as temporary graminoid marshes (M-G [II]) and four were classified as seasonal graminoid marshes (M-G [III]). All wetlands except W0098, W1362a, W1362b, and W139a were persistent on the landscape throughout the years based on the historical air photo record. These wetlands were difficult to distinguish from adjacent vegetation in some photos (1963, 1970, 1980 and 1993), while other wetlands were well-defined in these years. All wetlands appeared to be dominated by graminoid vegetation in all the years assessed (Appendix B).

Climate analysis of local precipitation data for years corresponding with historical aerial photographs shows that below-average precipitation occurred in years 2009 and 2018, above-average precipitation occurred in 1963 and 1980. Normal precipitation occurred in 1970 and 1993. Precipitation data were not available for years prior to 1955. Wetland extents appear to be somewhat correlated with precipitation patterns, but differences are likely more attributable to agricultural land modifications through the years (Figure 3).

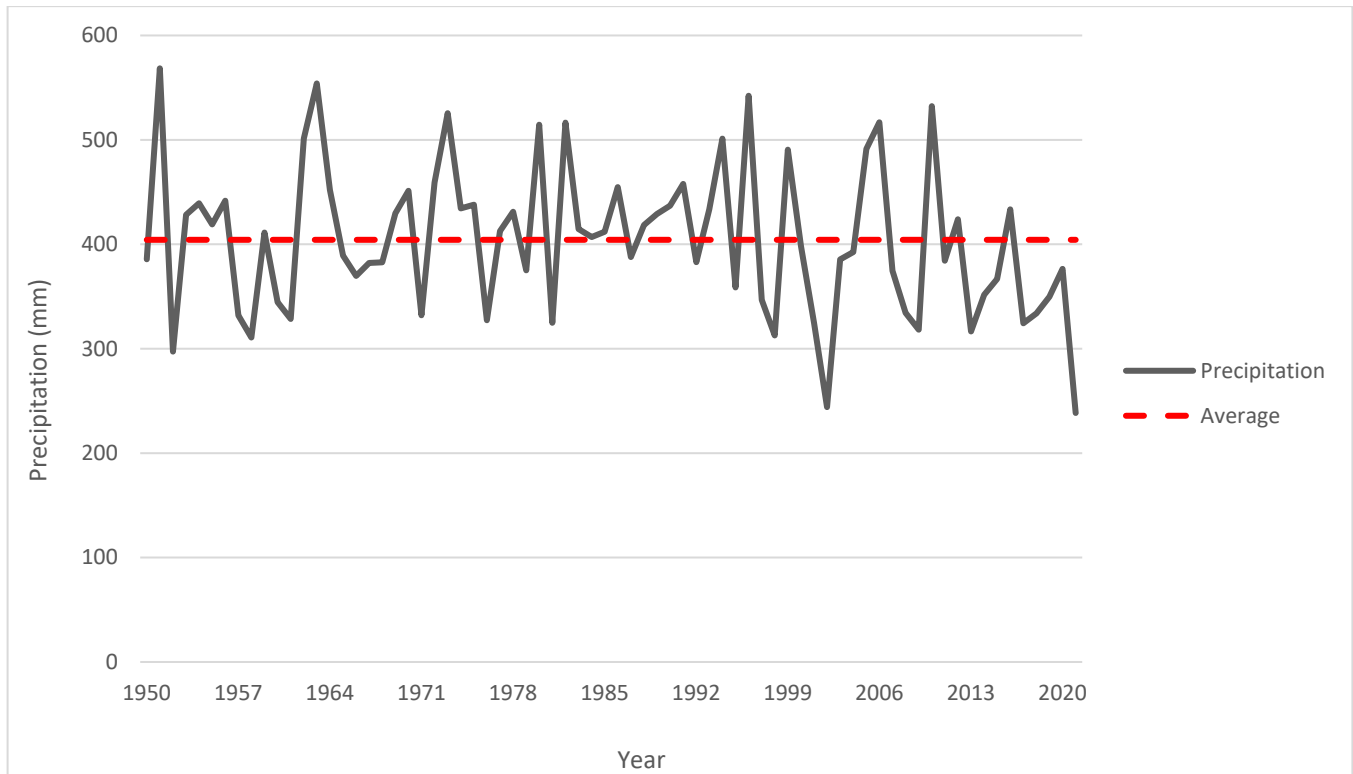


Figure 3: Mean and Annual Precipitation from 1950 to 2021 in 39-41-W4M, 39-15-W4M, and 40-15-W4M

Source: GOA (2022d)

3.2 Wetland Field Assessment

3.2.1 Wetland Identification, Delineation and Classification

Wetland identification and delineation followed Pathway 5 (comprehensive desktop delineation with field verification) as outlined in the *Alberta Wetland Identification and Delineation Directive* (GOA 2015a). At a representative location within the wetland, the soil, surface water and vegetation community were evaluated in accordance with the *Alberta Wetland Identification and Delineation Directive* (GOA 2015a). Detailed vegetation surveys were carried out at one location of the wetland and interpretation of high-resolution 3D imagery was used to support delineation of the wetland boundary (Figure 2). The vegetation, soil, and hydrology characteristics used for wetland classification are included in Table 2, while the catchment area for the wetland is shown in Figure 4.

Conductivity and pH were not measured as no open or standing water was present at the time of the field assessment (Table 2). The vegetation documented in the wetland supported the temporary and seasonal graminoid marsh classifications (GOA 2015c).

Six wetlands are temporary graminoid marshes (M-G-II), with a total delineated area of 0.87 ha. These wetlands were dominated by foxtail barley (*Hordeum jubatum*), slender wheatgrass (*Elymus trachycaulus*), cultivated barley (*Hordeum vulgare*), fowl bluegrass (*Poa palustris*), barnyard grass (*Echinochloa crusgalli*), and common cattail (*Typha latifolia*). The soil in these wetlands was characterized as being silty clay, silty clay loam, loam, and clay loam.

Four wetlands are seasonal graminoid marshes (M-G-III), with a total delineated area of 2.47 ha. These wetlands were dominated by Kentucky bluegrass (*Poa pratensis*), reed canary grass (*Phalaris arundinacea*), smooth brome (*Bromus inermis*), foxtail barley, pale persicaria (*Persicaria lapathifolia*), broad-leaved water-plantain (*Alisma triviale*), barnyard grass, common cattail, needle spike-rush (*Eleocharis acicularis*), and water smartweed (*Persicaria amphibia*). The soil in these wetlands was characterized as being silty clay loam, silty clay, and loam. Wetlands 2343 and 2348 are connected to one another through a natural drainage.

Table 2: Information and Evidence Used to Classify Wetlands to be Impacted by the Halkirk II Project

Wetland ID	AWCS Wetland Classification Code	Soil								Hydrology		Total Wetland Area (ha)	Vegetation Characteristics	Indicator Species/ Communities
		Organic Matter Type ^(a)	Organic Matter Depth (cm)	A Horizon Texture	A Horizon Depth (cm)	Drainage	Mottles Present (Yes/No)	Conductivity (µS/cm)	pH	Surface Water Inflows or Outflows (Yes/No)	Catchment Area ^(a) (ha)			
W0098	M-G (II)	-	-	Silty Clay	15	-	Yes	-	-	No	1.06	0.26	■ pasture	<ul style="list-style-type: none"> ■ <i>Hordeum jubatum</i> ■ <i>Cirsium arvense</i> ■ <i>Melilotus alba</i> ■ <i>Kochia scoparia</i> ■ <i>Tanacetum vulgare</i> ■ <i>Plantago major</i> ■ <i>Beckmannia syzigachne</i> ■ <i>Symphoricarpos albus</i> ■ <i>Salix sp.</i> ■ <i>Poa pratensis</i> ■ <i>Elymus trachycaulus</i>
W1362A	M-G (II)	-	-	Silty Clay Loam	30	-	-	-	-	No	9.77	0.20	■ cultivated	<ul style="list-style-type: none"> ■ <i>Hordeum vulgare</i>
W1362B	M-G (II)	-	-	Silty Clay Loam	18	-	-	-	-	No	17.00	0.14	■ cultivated	<ul style="list-style-type: none"> ■ <i>Hordeum vulgare</i>
W0139A	M-G (II)	-	-	Loam	29	-	Yes	-	-	No	0.21	0.08	■ pasture	<ul style="list-style-type: none"> ■ <i>Hordeum jubatum</i> ■ <i>Poa palustris</i> ■ <i>Bromus inermis</i> ■ <i>Taraxacum officinale</i> ■ <i>Polygonum arenastrum</i>
W2142	M-G (III)	-	-	Silty Clay Loam	13	-	-	-	-	No	112.23	1.27	■ cultivated	<ul style="list-style-type: none"> ■ <i>Poa pratensis</i> ■ <i>Phalaris arundinacea</i> ■ <i>Bromus inermis</i> ■ <i>Hordeum jubatum</i> ■ <i>Populus tremuloides</i> ■ <i>Elaeagnus commutata</i> ■ <i>Rumex occidentalis</i> ■ <i>Sonchus arvensis</i>
W2245	M-G (III)	LFH	2	Silty Clay	20	-	Yes	-	-	No	17.40	0.49	■ pasture	<ul style="list-style-type: none"> ■ <i>Bromus inermis</i> ■ <i>Phalaris arundinacea</i> ■ <i>Beckmannia syzigachne</i> ■ <i>Poa pratensis</i> ■ <i>Hordeum jubatum</i> ■ <i>Plantago major</i> ■ <i>Salix sp.</i> ■ <i>Cirsium arvense</i> ■ <i>Rumex confertus</i> ■ <i>Trifolium repens</i>
W2276	M-G (II)	-	-	Clay Loam	30	-	-	-	-	Yes	2.20	0.10	■ pasture	<ul style="list-style-type: none"> ■ <i>Echinochloa crusgalli</i> ■ <i>Hordeum jubatum</i> ■ <i>Typha latifolia</i>
W2283	M-G (II)	-	-	-	-	-	-	-	-	Yes	1.25	0.09	■ pasture	<ul style="list-style-type: none"> ■ <i>Echinochloa crusgalli</i> ■ <i>Typha latifolia</i> ■ <i>Gentianella amarella</i>

Table 2: Information and Evidence Used to Classify Wetlands to be Impacted by the Halkirk II Project

Wetland ID	AWCS Wetland Classification Code	Soil								Hydrology		Total Wetland Area (ha)	Vegetation Characteristics	Indicator Species/ Communities
		Organic Matter Type ^(a)	Organic Matter Depth (cm)	A Horizon Texture	A Horizon Depth (cm)	Drainage	Mottles Present (Yes/No)	Conductivity (µS/cm)	pH	Surface Water Inflows or Outflows (Yes/No)	Catchment Area ^(a) (ha)			
W2343	M-G (III)	-	-	Loam	29	Connected to W2348 through natural drainage	Yes	-	-	No	409.04	0.32	■ cultivated	<ul style="list-style-type: none"> ■ <i>Persicaria lapathifolia</i> ■ <i>Alisma triviale</i> ■ <i>Rumex sp.</i> ■ <i>Gnaphalium uliginosum</i> ■ <i>Echinochloa crusgalli</i>
W2348	M-G (III)	-	-	Silty Clay Loam	19	-	-	-	-	Yes	2.45	0.39	■ pasture	<ul style="list-style-type: none"> ■ <i>Typha latifolia</i> ■ <i>Alisma triviale</i> ■ <i>Eleocharis acicularis</i> ■ <i>Lemna sp.</i> ■ <i>Persicaria amphibia</i>

Notes:

- = no data; cm = centimetre; ha = hectare; pH = potential of hydrogen; µS/cm = micro-Siemens per centimetre.

a) Areas calculated using 10TM_AEP_FOREST projection.

Table 3: Field Information and Indicators of Plant Species Used to Identify and Delineate Wetlands to be Impacted by the Halkirk II Project

Wetland ID	Classification Code ^(a)	Plot size (1 x 1 m, 5 x 5 m, 10 x 10 m, none)	Plot Location (UTM)			Plant Species Scientific Name	Plant Species Common Name	Species Stratum	Facultative Wetland or Obligate Wetland Species	Percent Relative Cover of Abundant species
			Zone	Easting	Northing				(Yes or No)	
Wetland/Non-Wetland Species Ratio										44.5:0
W0098	(M-G(II))	10 x 10 m	12	433868	5805680	<i>Hordeum jubatum</i>	foxtail barley	Graminoid	Yes	5
						<i>Cirsium arvense</i>	creeping thistle	Forb	Yes	1
						<i>Melilotus alba</i>	white sweet clover	Forb	Yes	3
						<i>Kochia scoparia</i>	summer-cypress	Forb	Yes	2
						<i>Tanacetum vulgare</i>	common tansy	Forb	Yes	0.1
						<i>Plantago major</i>	common plantain	Forb	Yes	0.1
						<i>Beckmannia syzigachne</i>	slough grass	Graminoid	Yes	0.1
						<i>Symphoricarpos albus</i>	snowberry	Tree/Shrub	Yes	1.1
						<i>Salix sp.</i>	N/A	Tree/Shrub	Yes	1.1
						<i>Poa pratensis</i>	Kentucky bluegrass	Graminoid	Yes	1
					<i>Elymus trachycaulus</i>	slender wheatgrass	Graminoid	Yes	30	
Wetland/Non-Wetland Species Ratio										100:0
W1362A	(M-G(II))	10 x 10 m	12	438772	5803851	<i>Hordeum vulgare</i>	cultivated barley	Graminoid	Yes	100
Wetland/Non-Wetland Species Ratio										100:0
W1362B	(M-G(II))	10 x 10 m	12	438938	5803898	<i>Hordeum vulgare</i>	cultivated barley	Graminoid	Yes	100
Wetland/Non-Wetland Species Ratio										43.5:2
W0139A	(M-G(II))	10 x 10 m	12	427776	5805226	<i>Hordeum jubatum</i>	foxtail barley	Graminoid	Yes	15
						<i>Poa palustris</i>	fowl bluegrass	Graminoid	Yes	25
						<i>Bromus inermis</i>	smooth brome	Graminoid	No	2
						<i>Taraxacum officinale</i>	common dandelion	Forb	Yes	3
						<i>Polygonum arenastrum</i>	equal-leaved knotgrass	Forb	Yes	0.5
Wetland/Non-Wetland Species Ratio										90:9
W2142	(M-G(III))	10 x 10 m	12	435985	5805652	<i>Poa pratensis</i>	Kentucky bluegrass	Graminoid	Yes	60
						<i>Phalaris arundinacea</i>	reed canary grass	Graminoid	Yes	20
						<i>Bromus inermis</i>	smooth brome	Graminoid	No	5
						<i>Hordeum jubatum</i>	foxtail barley	Graminoid	Yes	5
						<i>Populus tremuloides</i>	aspen	Tree/Shrub	No	4
						<i>Elaeagnus commutata</i>	silverberry	Tree/Shrub	No	1
	<i>Rumex occidentalis</i>	western dock	Forb	Yes	2					

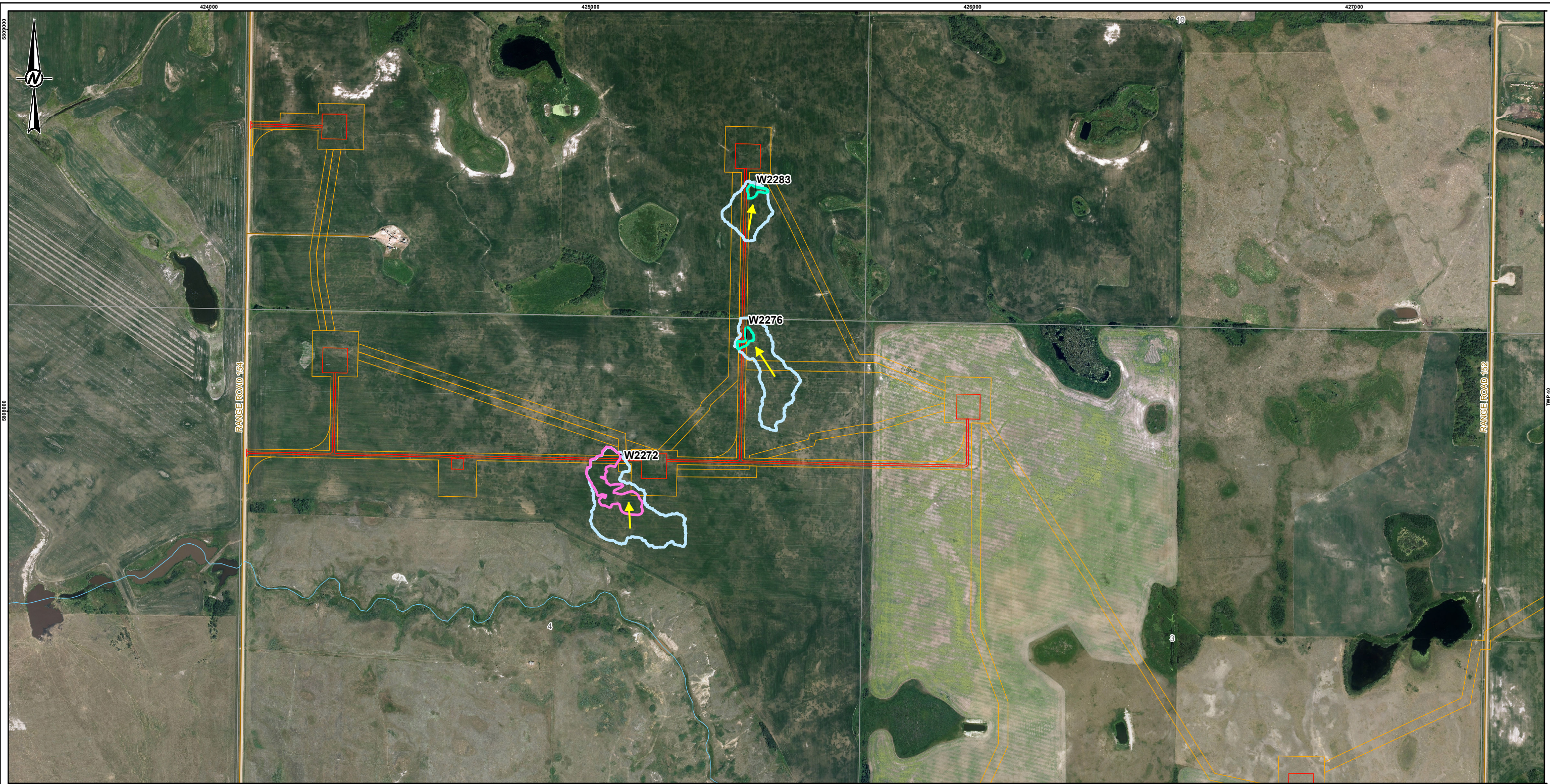
Table 3: Field Information and Indicators of Plant Species Used to Identify and Delineate Wetlands to be Impacted by the Halkirk II Project

Wetland ID	Classification Code ^(a)	Plot size (1 x 1 m, 5 x 5 m, 10 x 10 m, none)	Plot Location (UTM)			Plant Species Scientific Name	Plant Species Common Name	Species Stratum	Facultative Wetland or Obligate Wetland Species (Yes or No)	Percent Relative Cover of Abundant species
			Zone	Easting	Northing					
						<i>Sonchus arvensis</i>	perennial sow-thistle	Forb	Yes	3
Wetland/Non-Wetland Species Ratio										
W2245	(M-G(III))	10 x 10 m	12	434652	5805028	<i>Bromus inermis</i>	smooth brome	Graminoid	Yes	30
						<i>Phalaris arundinacea</i>	reed canary grass	Graminoid	Yes	40
						<i>Beckmannia syzigachne</i>	slough grass	Graminoid	Yes	0.1
						<i>Poa pratensis</i>	Kentucky bluegrass	Graminoid	Yes	1
						<i>Hordeum jubatum</i>	foxtail barley	Graminoid	Yes	0.1
						<i>Plantago major</i>	common plantain	Forb	Yes	0.1
						<i>Salix sp.</i>	willow	Tree/Shrub	Yes	0.1
						<i>Cirsium arvense</i>	creeping thistle	Forb	Yes	2
						<i>Rumex confertus</i>	dock	Forb	Yes	1
					<i>Trifolium repens</i>	white clover	Forb	Yes	0.1	
Wetland/Non-Wetland Species Ratio										
100:0										
W2276	(M-G(II))	10 x 10 m	12	425413	5808202	<i>Echinochloa crusgalli</i>	barnyard grass	Graminoid	Yes	80
						<i>Hordeum jubatum</i>	foxtail barley	Graminoid	Yes	10
						<i>Typha latifolia</i>	common cattail	Forb	Yes	10
Wetland/Non-Wetland Species Ratio										
101:0										
W2283	(M-G(II))	10 x 10 m	12	425423	5808576	<i>Echinochloa crusgalli</i>	barnyard grass	Graminoid	Yes	95
						<i>Typha latifolia</i>	common cattail	Forb	Yes	5
						<i>Gentianella amarella</i>	felwort	Forb	Yes	1
Wetland/Non-Wetland Species Ratio										
63:0										
W2343	(M-G(III))	10 x 10 m	12	428550	5807699	<i>Persicaria lapathifolia</i>	pale persicaria	Forb	Yes	10
						<i>Alisma triviale</i>	broad-leaved water-plantain	Forb	Yes	40
						<i>Rumex sp.</i>	N/A	Forb	Yes	1
						<i>Gnaphalium uliginosum</i>	low cudweed	Forb	Yes	2
						<i>Echinochloa crusgalli</i>	barnyard grass	Graminoid	Yes	10
Wetland/Non-Wetland Species Ratio										
101:1										
W2348	(M-G(III))	10 x 10 m	12	428712	5807705	<i>Typha latifolia</i>	common cattail	Forb	Yes	60
						<i>Alisma triviale</i>	broad-leaved water-plantain	Forb	Yes	25
						<i>Eleocharis acicularis</i>	needle spike-rush	Graminoid	Yes	10
						<i>Lemna sp.</i>	duckweed	Forb	Yes	1
						<i>Persicaria amphibia</i>	water smartweed	Forb	Yes	5

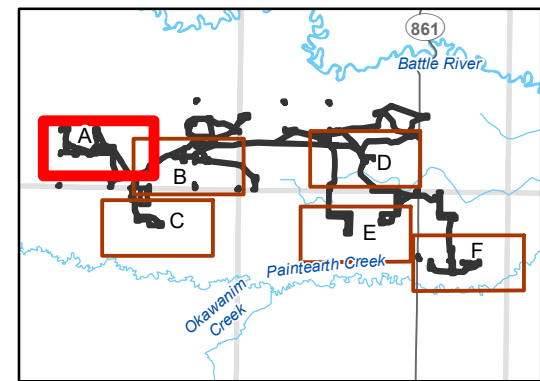
m = metres; UTM = Universal Transverse Mercator.

a) Wetland classes following AWCS (GOA 2015c).

b) Based on *Preliminary List of Plant Species Found in Wetlands* in AWCS (GOA 2015c), and wetland status in the United States Department of Agriculture Plants Database (USDA 2021).



- LEGEND**
- PRIMARY HIGHWAY
 - SECONDARY HIGHWAY
 - LOCAL ROAD
 - RAILROAD
 - WATERCOURSE
 - FLOW DIRECTION
 - OPERATION FOOTPRINT (PERMANENT IMPACTS)
 - CONSTRUCTION FOOTPRINT (TEMPORARY IMPACTS)
 - WETLAND CATCHMENT AREA
 - WETLAND CLASSES
 - EPHEMERAL WATERBODY
 - TEMPORARY GRAMINOID MARSH (M-G-II)
 - SEASONAL GRAMINOID MARSH (M-G-III)
 - NATURAL DRAINAGE



CLIENT
Capital Power

CONSULTANT
WSP

YYYY-MM-DD	2023-03-01
DESIGNED	TA
PREPARED	NB
REVIEWED	KLW
APPROVED	KLW

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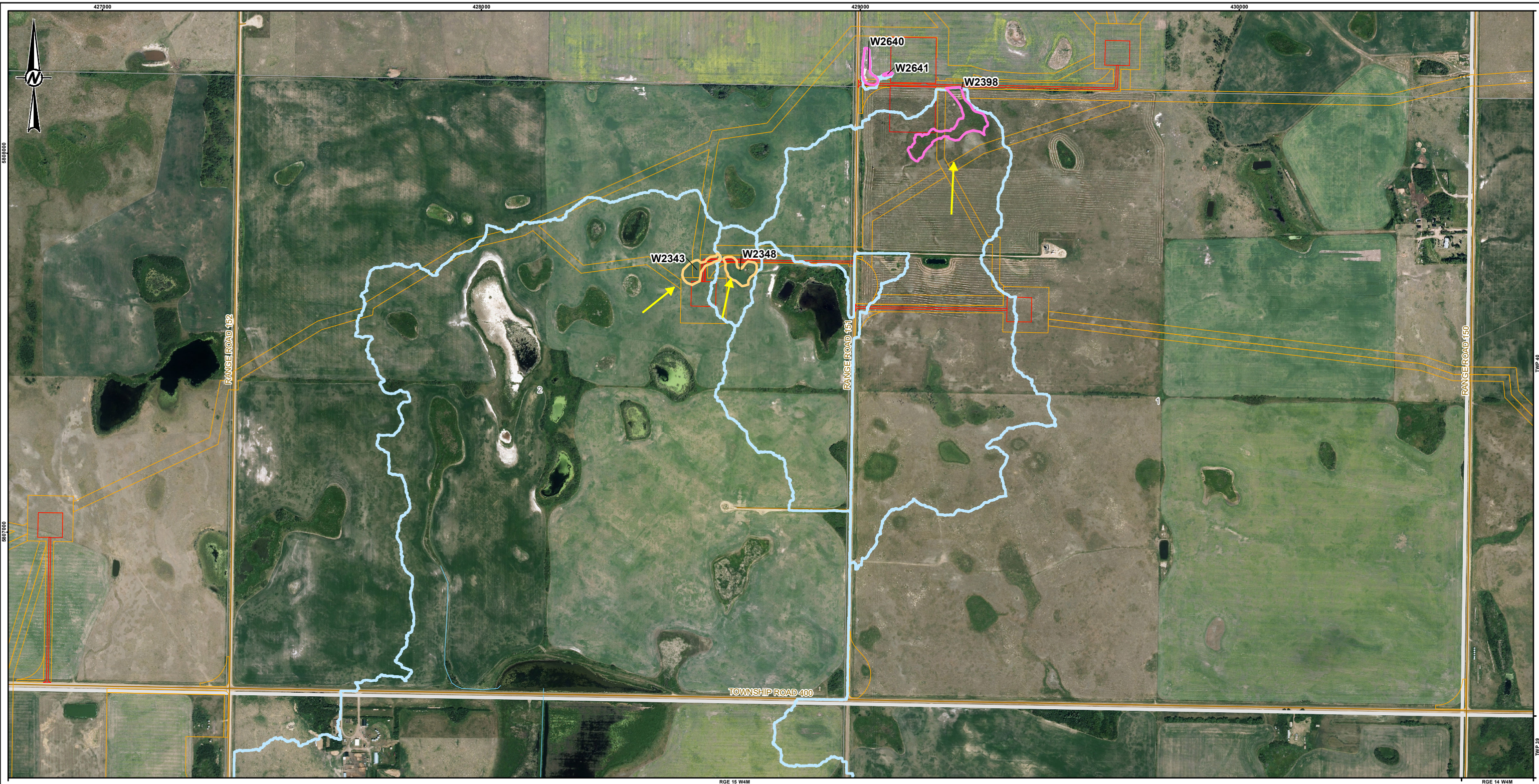
PROJECT
HALKIRK 2 WIND POWER PROJECT

TITLE
CATCHMENT AREAS

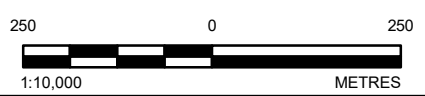
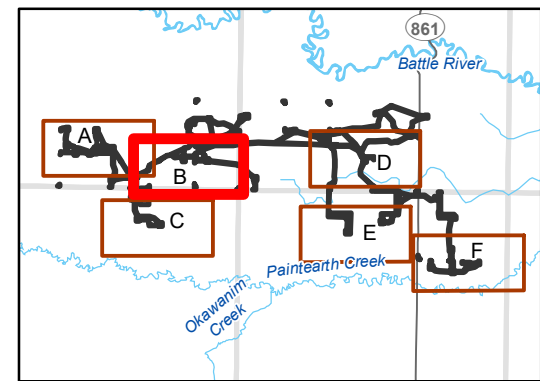
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- LEGEND**
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 - LOCAL ROAD
 - RAILROAD
 - WATERCOURSE
 - ➔ FLOW DIRECTION
 - ▭ OPERATION FOOTPRINT (PERMANENT IMPACTS)
 - ▭ CONSTRUCTION FOOTPRINT (TEMPORARY IMPACTS)
 - ▭ WETLAND CATCHMENT AREA
 - WETLAND CLASSES**
 - ▭ EPHEMERAL WATERBODY
 - ▭ TEMPORARY GRAMINOID MARSH (M-G-II)
 - ▭ SEASONAL GRAMINOID MARSH (M-G-III)
 - ▭ NATURAL DRAINAGE



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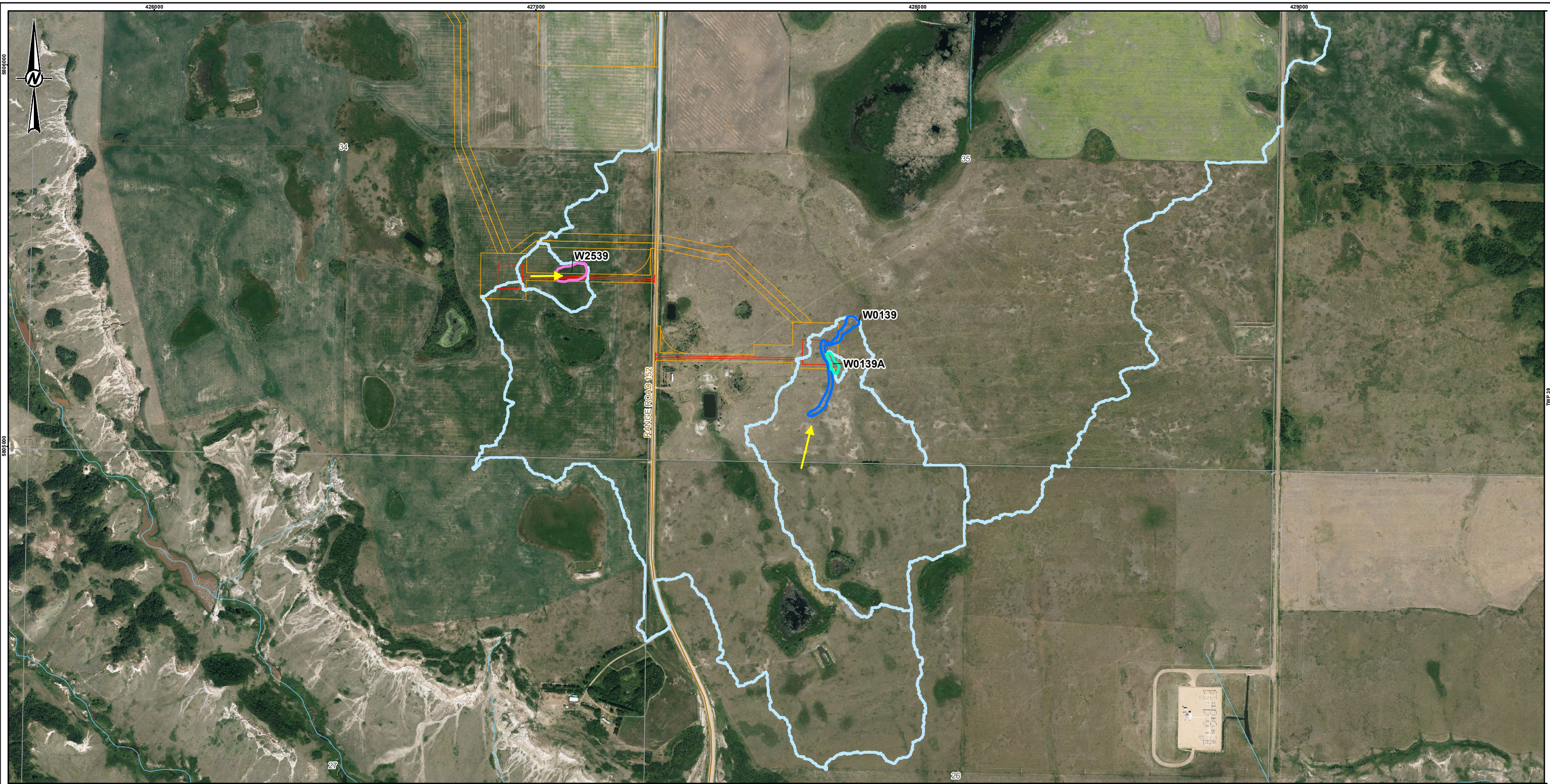
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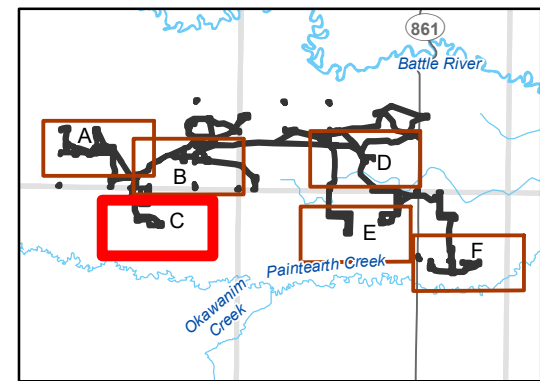
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 - NATURAL DRAINAGE



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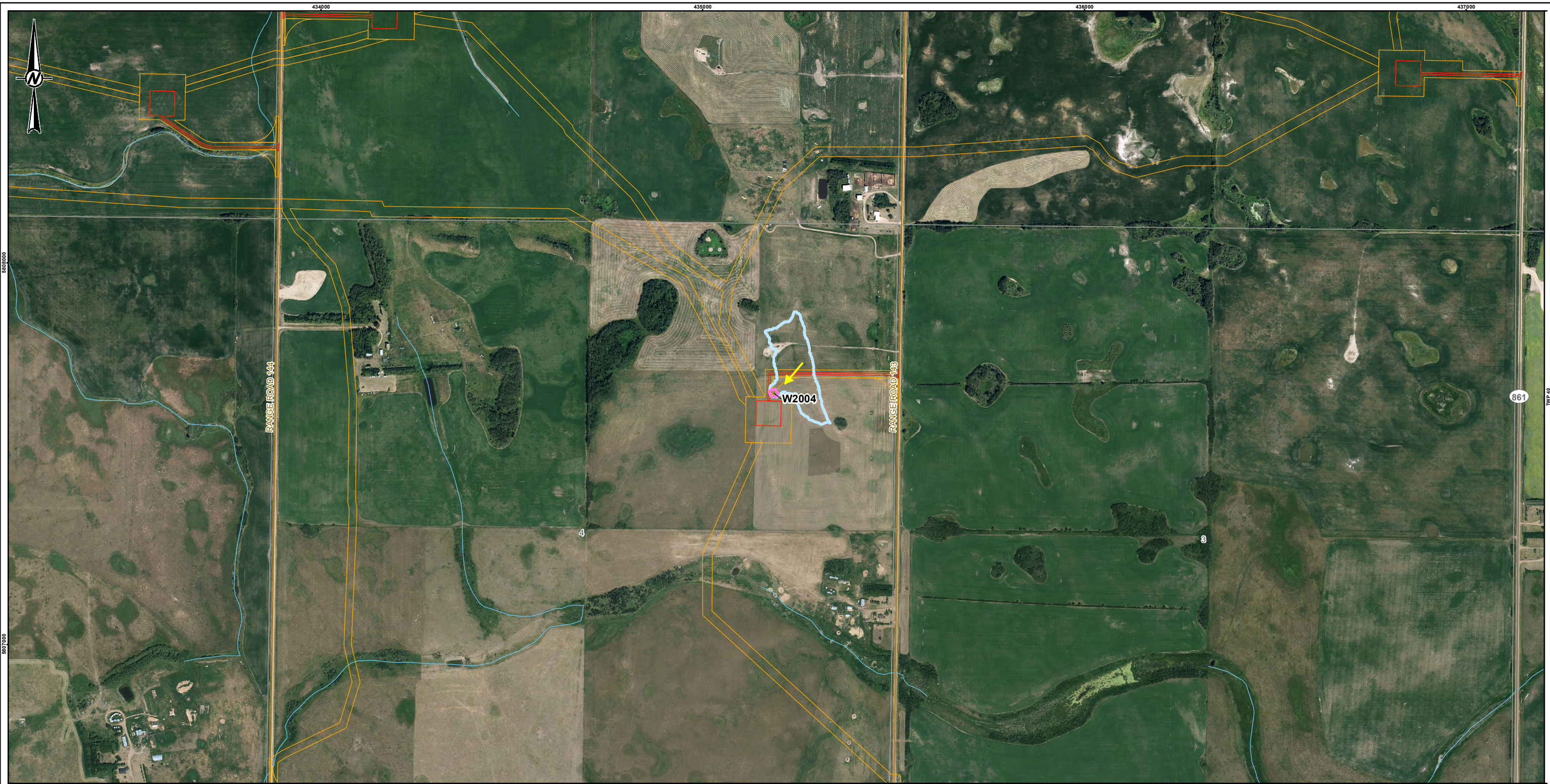
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HALKIRK 2 WIND POWER PROJECT

TITLE
CATCHMENT AREAS

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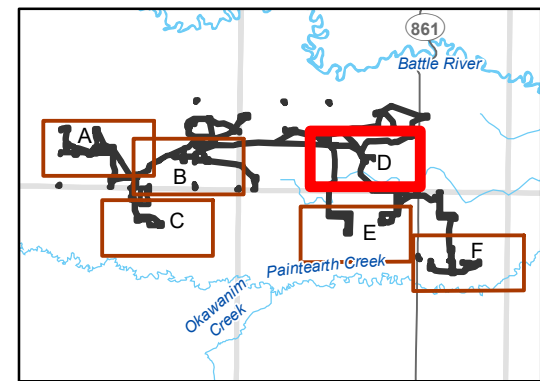
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 - ▭ TEMPORARY GRAMINOID MARSH (M-G-II)
 - ▭ SEASONAL GRAMINOID MARSH (M-G-III)
 - ▭ NATURAL DRAINAGE



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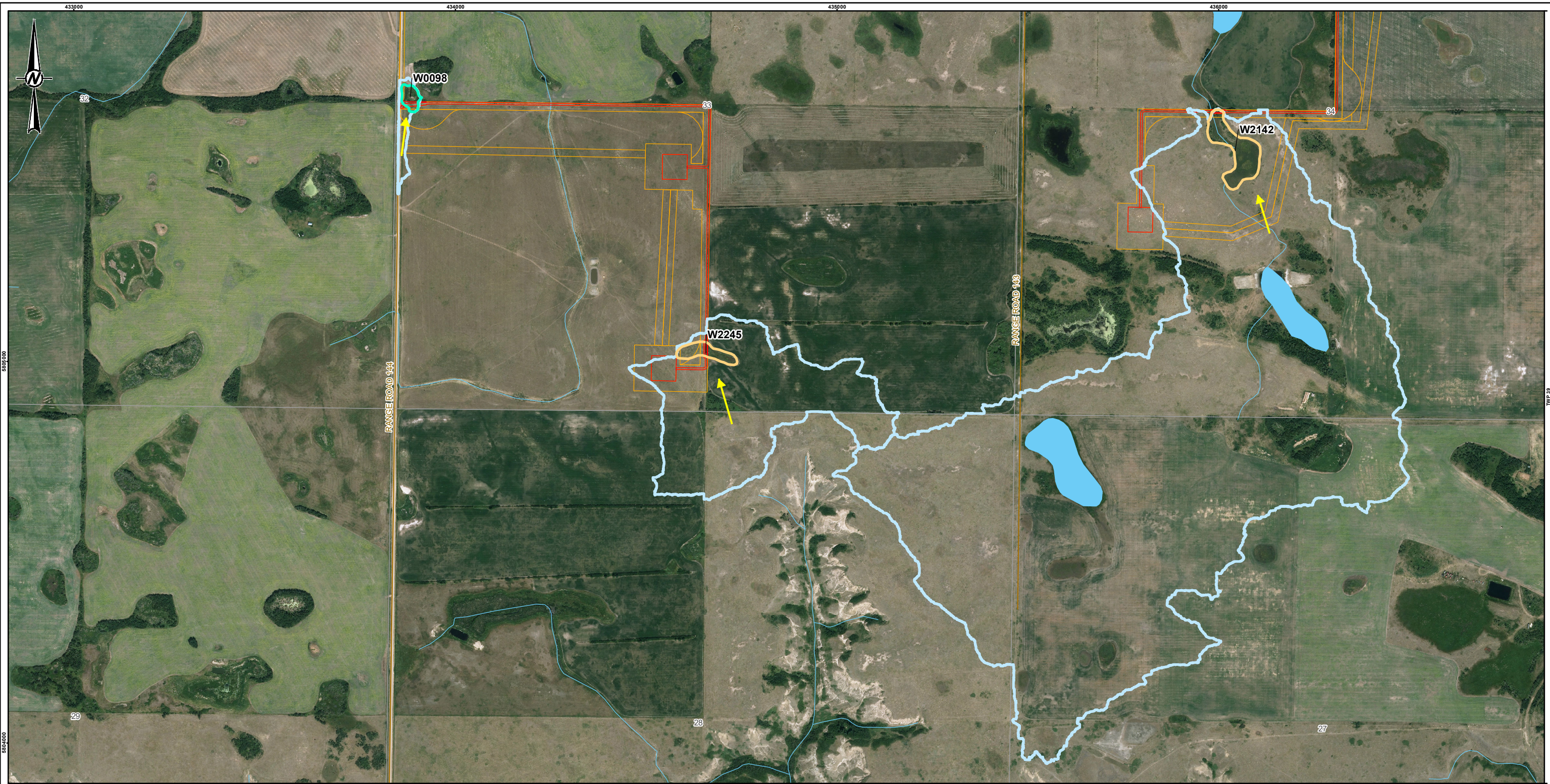
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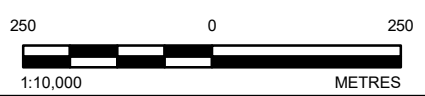
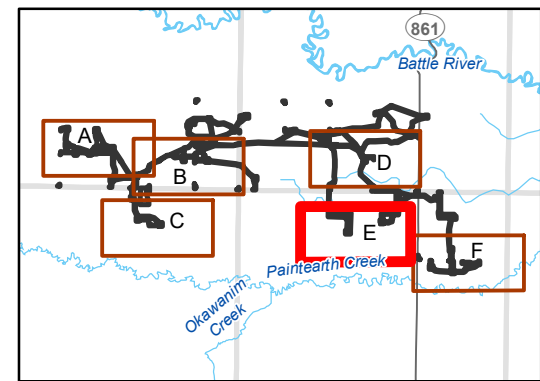
PROJECT
HALKIRK 2 WIND POWER PROJECT

TITLE
CATCHMENT AREAS

PROJECT NO. 21451763	CONTROL	REV. 0	FIGURE 4-D
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 - WATERCOURSE
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 - WETLAND CLASSES**
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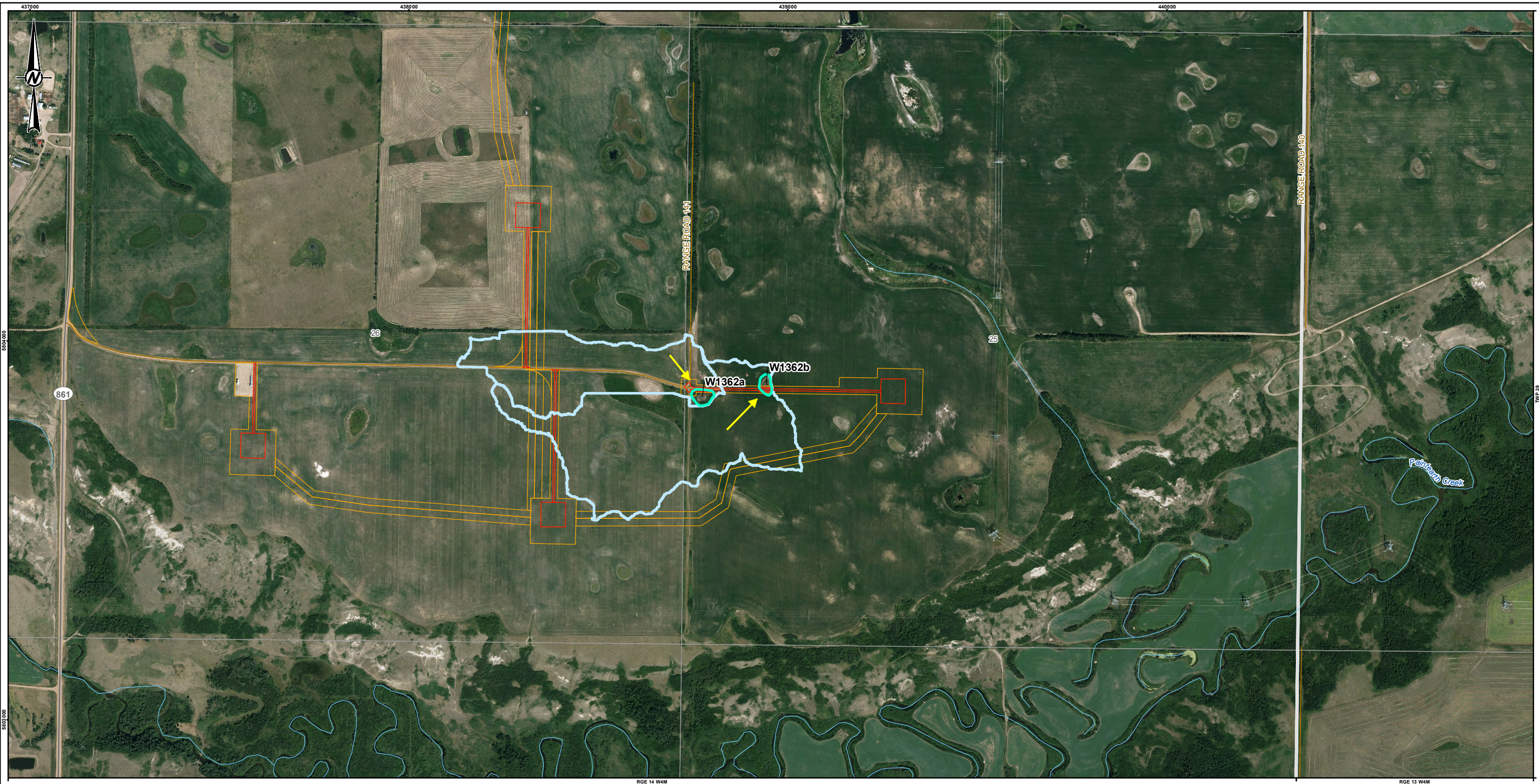
PROJECT
HALKIRK 2 WIND POWER PROJECT

TITLE
CATCHMENT AREAS

PROJECT NO.	CONTROL	REV.	FIGURE
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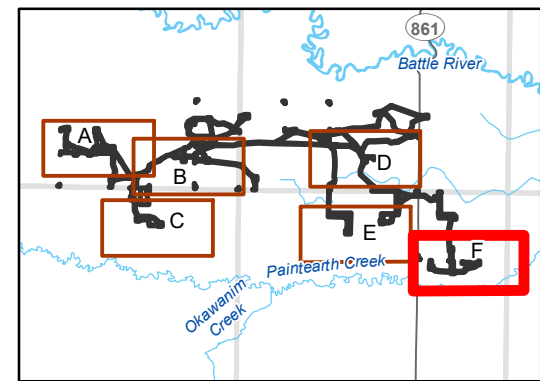
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 Paintearth Creek
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 - RAILROAD
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 - ➔ FLOW DIRECTION
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PROJECTION: UTM ZONE 12 DATUM: NAD 83

PROJECT
HALKIRK 2 WIND POWER PROJECT

TITLE
CATCHMENT AREAS

PROJECT NO.	CONTROL	REV.	FIGURE
21451763		0	4-F

3.2.2 Invasive and Listed Species

No listed plant species (i.e., ACIMS, SARA, *Wildlife Act*) were observed during the field assessments.

One weed species, creeping thistle (*Cirsium arvense*) was observed during the surveys. Creeping thistle is classified as noxious under the *Weed Control Regulation* (GOA 2016) of the *Weed Control Act* (GOA 2022e). No prohibited noxious weeds were observed.

3.2.3 Wetland Relative Value Assessment

The ABWRET-A tool was used to calculate the relative value of wetlands W0098, W1362A, W1362B, W139A, W2142, W2245, W2276, W2283, W2343, and W2348 (GOA 2015d) by AEP. Results of the ABWRET-A were received on January 26, 2023, and are provided in Table 4 and Appendix E. All wetlands have a relative wetland value of D except for W139A, which has a relative wetland value of C.

Table 4: Permanent Wetland Loss and ABWRET-A Wetland Value Within the POF

Wetland Name	Legal Location	Wetland Class	Baseline Wetland Area (ha) ^(a)	Wetland Area Impacted (ha)	% of Wetland Area Impacted	ABWRET-A Wetland Value
W0098	SW Sec-33 Twp-039 Rge-14 Mer-4	M-G (II)	0.26	0.05	20	D
W1362A	SW Sec-25 Twp-039 Rge-14 Mer-4	M-G (II)	0.20	0.02	13	D
W1362B	SW Sec-25 Twp-039 Rge-14 Mer-4	M-G (II)	0.14	0.04	25	D
W139A	SW Sec-35 Twp-039 Rge-15 Mer-4	M-G (II)	0.08	0.002	2	C
W2142	SW Sec-34 Twp-039 Rge-14 Mer-4	M-G (III)	1.27	0.02	2	D
W2245	SW Sec-33 Twp-039 Rge-14 Mer-4	M-G (III)	0.49	0.04	8	D
W2276	NE Sec-04 Twp-040 Rge-15 Mer-4	M-G (II)	0.10	0.02	22	D
W2283	SE Sec-09 Twp-040 Rge-15 Mer-4	M-G (II)	0.10	0.003	3	D
W2343	NE Sec-02 Twp-040 Rge-15 Mer-4	M-G (III)	0.32	0.05	17	D
W2348	NE Sec-02 Twp-040 Rge-15 Mer-4	M-G (III)	0.39	0.03	8	D
<i>Totals:</i>			3.35	0.28	8	n/a

Note: numbers are rounded for presentation purposes.

ha = hectare

Areas calculated using 10TM_AEP_FOREST projection.

4.0 DISCUSSION

4.1 Proposed Impacts on Wetlands

The permanent impacts to the wetlands are associated with turbine pads and access roads. Turbine pads will be prepared using graders, compacters, tracked bulldozers, and hoes to strip topsoil and subsoil. Permanent access roads will be built using tracked bulldozers and graders to strip topsoil and upper subsoil. Therefore, grading

activities associated with site preparation for the Project will result in the direct, permanent removal of 0.28 ha of wetland area, representing a partial loss ranging between 2% to 25% for all wetlands (Table 4). The extent of grading activities will be restricted to what is required to accommodate site access, minimum standards for safety, construction, and operation of the Project where possible. Reclamation activities following grading activities within the POF will include replacing stripped subsoil and topsoil and wetlands will be left to revegetate naturally.

4.2 Wetland Mitigation Plan

Applicants for *Water Act* authorization associated with disturbance of wetlands are expected to demonstrate adherence to the mitigation hierarchy for wetlands, beginning with avoidance, followed by minimization (which includes reclamation), and finally replacement, as described in the Alberta *Wetland Policy* (GOA 2013). Avoidance or minimization of wetland impacts can eliminate or reduce the need for wetland compensation; however, unavoidable, and authorized impacts will require wetland replacement as per the *Alberta Wetland Mitigation Directive* (GOA 2018), as outlined in the Government of Alberta's *Wetland Regulatory Requirements Guide* (GOA 2015e).

Mitigation applied during Project planning and to be implemented during construction and operation of the Project, has been developed in consideration of the mitigation hierarchy consistent with the *Alberta Wetland Policy* (GOA 2013).

4.2.1 Avoidance

General avoidance of impact to wetlands was considered as part of the initial Project siting while balancing other factors like wind energy resource availability, geotechnical considerations, noise and shadow flicker considerations, landowner considerations and municipal bylaws. Preliminary desktop mapping was provided to Capital Power during the initial design phases of the Project. When designing the Project, Capital Power's priority was to avoid impacts to wetlands to the extent possible. The Project footprint is dominated by modified vegetation types including cultivation occupying 66.6% and tame pasture or hay occupying 30.8%. Wetlands and waterbodies represent only 1.55% of the Project footprint (WSP Golder 2022). Of the 886 wetlands and waterbodies in the Project Study Area, Capital Power avoided 98 % of wetlands and waterbodies from the proposed POF in the Project Study Area. Capital Power prioritized avoiding impacts to higher permanence wetlands to the greatest extent possible (Class III and greater) in alignment with the *Wildlife Directive for Wind Energy Projects* (AEP 2018). The POF has avoided direct impacts to all Class IV and V wetlands. However, Capital Power was not able to avoid six ephemeral waterbodies, one drainage channel, six class II wetlands and four class III wetlands in consideration of the other factors noted above.

The impacts to wetlands as identified in this WAIR will result from grading activities within the POF and are assumed to be unavoidable, based on a conservative approach, to accommodate site access and construction engineering requirements for both the construction and operation stages of the Project.

4.3 Minimization Proposal

Capital Power will incorporate best practices to reduce impacts including indirect impacts on wetland areas adjacent to the POF. Minimization measures to protect wetland in the POF will include marking wetlands and associated setbacks prior to the start of construction, prioritizing construction in these areas during dry ground conditions, and use of rig matting, geotextiles, vegetated buffer zones, earthen berms and/or silt fencing, as appropriate (WSP Golder 2022). Heavy equipment, such as bulldozers, needed to hold taglines to raise the blades and nacelle during turbine construction will not enter wetlands unless prior approval is granted.

Following the construction phase, disturbed areas will be stabilized with seed mixes that will be selected by consulting guidelines and landowners. Permanent erosion and spill control measures will be employed, including re-vegetation or placement of large diameter rock on slopes and the installation of permanent berms.

The Alberta Environment and Parks-Fish and Wildlife Stewardship Renewable Energy Amendment Letter (AEP-FWS 2022) states that the proponent must follow requirements on siting, pre-construction surveys, construction, operation, and post-construction monitoring and mitigation plans. Therefore, pre-construction wildlife surveys will be completed including: migratory bird surveys (spring and fall), sharp tailed grouse surveys, breeding bird surveys, bat surveys (spring and fall), and raptor nest occupancy surveys. Nest sweeps will be required prior to construction activities during the grassland bird breeding season (April 1 to July 1) and migratory bird nesting Zone B4 (April 14 to August 28; ECCC 2018). To avoid potential impacts on wetland-dependent wildlife within adjacent wetlands, vegetation clearing will be scheduled in outside of the B4 nesting zone restricted period for migratory birds (April 14 to August 28; ECCC 2018).

4.4 Reclamation Proposal

The Project lifespan is estimated to be 30+ years (WSP Golder 2022). Reclamation of wetlands W0098, W1362A, W1362B, W139A, W2142, W2245, W2276, W2283, W2343, and W2348 requires contouring of the wetland boundaries and surrounding lands. However, as per engineering designs and Project footprint layout, this is not feasible during the life of the Project. Therefore, for the purpose of this WAIR, wetland reclamation is not considered to meet the wetland impact minimization expectations under the *Alberta Wetland Policy* and it is assumed that permanent loss of wetlands W0098, W1362A, W1362B, W139A, W2142, W2245, W2276, W2283, W2343, and W2348 will occur.

4.5 Replacement Proposal

As outlined in Section 4.4, reclamation of wetland impacts within the context of the mitigation directive (GOA 2018) is not feasible. Unavoidable and authorized impacts will require the payment of a wetland replacement fee as per the *Alberta Wetland Mitigation Directive* as outlined in the Government of Alberta's *Wetland Regulatory Requirements Guide* (GOA 2015e). For the purpose of the *Water Act* application and associated with this WAIR, Capital Power is currently proposing to compensate for permanent impacts to wetlands W0098, W1362A, W1362B, W139A, W2142, W2245, W2276, W2283, W2343, and W2348. The Project is within Relative Wetland Value Assessment Unit 16 (RWVAU No. 16) (GOA 2018). The wetland replacement fee rate for public land within RWVAU No. 16 is \$18,500/ ha. Wetland replacement fees are calculated based on the relative wetland value ratio derived from the wetland replacement matrix. Based on the calculated area required for replacement (0.287 ha; Table 5), Capital Power has estimated a wetland replacement fee payment value of \$5,306.21.

Table 5: Wetland Replacement Proposal for Unavoidable, Permanent Wetland Losses at the Capital Power Project

Wetland Name	Legal Location	Wetland Class	Baseline Area (ha) ^(a)	Area of Wetland Permanently Impacted (ha) ^(b)	Relative Wetland Value	Replacement Ratio	Area (ha) required for replacement	Replacement Fees (\$)
W0098	SW Sec-33 Twp-039 Rge-14 Mer-4	M-G (II)	0.26	0.051	D	1:1	0.051	943.91
W1362A	SW Sec-25 Twp-039 Rge-14 Mer-4	M-G (II)	0.20	0.022	D	1:1	0.024	452.40
W1362B	SW Sec-25 Twp-039 Rge-14 Mer-4	M-G (II)	0.14	0.035	D	1:1	0.035	649.11

Table 5: Wetland Replacement Proposal for Unavoidable, Permanent Wetland Losses at the Capital Power Project

Wetland Name	Legal Location	Wetland Class	Baseline Area (ha) ^(a)	Area of Wetland Permanently Impacted (ha) ^(b)	Relative Wetland Value	Replacement Ratio	Area (ha) required for replacement	Replacement Fees (\$)
W139A	SW Sec-35 Twp-039 Rge-15 Mer-4	M-G (II)	0.08	0.002	C	2:1	0.004	70.52
W2142	SW Sec-34 Twp-039 Rge-14 Mer-4	M-G (III)	1.27	0.024	D	1:1	0.024	450.11
W2245	SW Sec-33 Twp-039 Rge-14 Mer-4	M-G (III)	0.49	0.037	D	1:1	0.037	677.30
W2276	NE Sec-04 Twp-040 Rge-15 Mer-4	M-G (II)	0.10	0.023	D	1:1	0.023	420.36
W2283	SE Sec-09 Twp-040 Rge-15 Mer-4	M-G (II)	0.10	0.003	D	1:1	0.003	48.69
W2343	NE Sec-02 Twp-040 Rge-15 Mer-4	M-G (III)	0.32	0.054	D	1:1	0.054	990.55
W2348	NE Sec-02 Twp-040 Rge-15 Mer-4	M-G (III)	0.39	0.033	D	1:1	0.039	603.27
Total			3.35	0.285	n/a	n/a	0.287	5,306.21

Note: Some numbers are rounded for presentation purposes; therefore, totals may not equal the sum of the individual values.

ha = hectare.

a) Areas calculated using 10TM_AEP_FOREST projection.

b) Replacement cost of \$18,500 per hectare of wetland within public land in Relative Wetland Value Assessment Unit 16.

5.0 SUMMARY

Ten wetlands occupying a total baseline area of 3.35 ha including W0098, W1362A, W1362B, W139A, W2142, W2245, W2276, W2283, W2343, and W2348, will be permanently impacted by the Project. Based on this assessment, authorization for wetland impacts under the *Water Act* (GOA 2000a) is required for the proposed construction activities for the Project because the wetlands are naturally occurring basins that have been persistent throughout the years (Figure 2, Appendix B). All wetlands are currently temporary graminoid marshes (M-G-II) and seasonal graminoid marshes (M-G-III), and therefore do not require bed and shore ownership assessment as per Section 3 of the *Public Lands Act* (GOA 2000b).

No listed wildlife or vegetation species were identified in the POF during the field assessment. One noxious weed species (creeping thistle) was found at wetlands, W0098 and W2245. The Project construction will result in permanent loss of 0.285 ha of wetland area. Capital Power proposes utilizing the wetland replacement fee option (GOA 2018) to replace the permanent wetland loss associated with the Project. Based on relative wetland value scores for the wetlands and their associated Relative Wetland Value Assessment Unit (16), a total of \$5,306.21 is being proposed for wetland replacement fee payment.

Furthermore, to reduce the risk of additional impacts on adjacent wetlands, Capital Power is committed to the use of operational best management practices as described in this document.

6.0 LIMITATIONS AND USE OF REPORT

This report was prepared for the exclusive use of Capital Power and is intended to provide a wetland assessment at the time of the data collection period. Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of the third parties. WSP disclaims responsibility of consequential financial effects on transactions or property values, or requirements for follow-up actions and costs.

The report is based on data and information collected during the evaluation. It is based solely on the conditions on the site encountered at the time of the data collection, supplemented by a review of historical information and data obtained by WSP as described in this report, and discussions with representatives of Capital Power, as reported herein. Except as otherwise may be requested, WSP disclaims any obligation to update this report for events taking place, or with respect to information that becomes available to WSP after the time during which WSP conducted the evaluation. No soil, vegetation, wildlife, water, liquid, gas, product or chemical sampling and analytical testing other than that described herein at or in the vicinity of the Site were conducted as part of this evaluation.

In preparing this report, WSP has relied in good faith on information provided by other individuals noted in this report. WSP has assumed that the information provided is factual and accurate. In addition, the findings in this report are based, to a large degree, upon information that may become invalid over time due to the dynamic nature of the ecological systems evaluated in this report. The data collected and interpreted for this project are considered obsolete after a period of three years as per Alberta Wetland Assessment and Impact Report Directive guidelines (GOA 2017) from the date of data collection. WSP accepts no responsibility for any deficiency, misstatement or inaccuracy contained in this report as a result of omissions, misinterpretations or fraudulent acts of persons contacted, or the third parties identified herein.

WSP makes no other representations whatsoever, including those concerning the legal significance of its findings, or as to other legal matters touched on in this report, including, but not limited to, ownership of any property, or the application of any law to the facts set forth herein.

Signature Page

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Senior, Vegetation Ecologist, BSc, PAg, PBIol, RPBio

7.0 REFERENCES

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APPENDIX A

**Ephemeral Waterbodies and
Drainage**

Ephemeral Waterbodies Permanently Impacted by the Halkirk 2 Wind Project

Wetland ID	Waterbody Classification ^(a)	Code	Soil Characteristics	Hydrology Characteristics	Vegetation Characteristics ^(b)	Indicator Species/Communities
W0139	Natural Drainage	Natural Drainage	No soil data collected	Appears as a drainage based on historic imagery review	No vegetation data collected	N/A
W2004	Ephemeral Waterbody	EWB	No mottling observed within 30 cm	No standing water was present	<ul style="list-style-type: none"> ▪ Quackgrass (<i>Elymus repens</i>): FACU ▪ American vetch (<i>Vicia americana</i>): FACU ▪ Timothy (<i>Phleum pratense</i>): FACU ▪ <i>Poa spp.</i> ▪ Alsike clover (<i>Trifolium hybridum</i>): FACU 	No hydric soil properties. Absence of vegetation indicators as all vegetation noted was Facultative Upland (FACU).
W2272	Ephemeral Waterbody	EWB	No soil data collected	No standing water was present	<ul style="list-style-type: none"> ▪ Oat crop field 	No vegetation species observed other than oat crop. Absence of vegetation indicators.
W2398	Ephemeral Waterbody	EWB	Faint mottling observed at 26 cm	No standing water was present	<ul style="list-style-type: none"> ▪ Pineapple weed (<i>Matricaria matricariodes</i>) ▪ Red clover (<i>Trifolium pratense</i>): FACU ▪ Timothy (<i>Phleum pratense</i>): FACU ▪ Stinkweed (<i>Thlaspi arvense</i>) 	Faint mottling observed. Absence of vegetation indicators as all vegetation noted was Facultative Upland (FACU).
W2539	Ephemeral Waterbody	EWB	No mottling present. Upper horizon consists of a dark silty loam	No standing water was present	<ul style="list-style-type: none"> ▪ Barnyard (<i>Echinochloa crus-galli</i>) ▪ Oat crop 	No hydric soil properties and absence of vegetation indicators.
W2640	Ephemeral Waterbody	EWB	No soil data collected	No standing water was present	<ul style="list-style-type: none"> ▪ Nuttall's alkali grass (<i>Puccinellia nuttalliana</i>) ▪ Foxtail barley (<i>Hordeum jubatum</i>): FAC ▪ Kochia (<i>Kochia scoparia</i>) ▪ Canola crop 	Absence of strong vegetation indicators. One vegetation species noted as facultative (FAC), which can occur on both on upland and wetlands.
W2641	Ephemeral Waterbody	EWB	No soil data collected	No standing water was present	<ul style="list-style-type: none"> ▪ Foxtail barley (<i>Hordeum jubatum</i>): FAC ▪ Kochia (<i>Kochia scoparia</i>) ▪ Canola crop 	Absence of strong vegetation indicators. One vegetation species noted as facultative (FAC), which can occur on both on upland and wetlands.



Photo A1: Photograph of W0139, a natural drainage (September 25, 2022)



Photo A2: Photograph of W2004, an ephemeral waterbody with quackgrass (*Elymus repens*), American vetch (*Vicia americana*), Timothy (*Phleum pratense*), grass (*Poa sp.*), and alsike clover (*Trifolium hybridum*). UTM: 12U 435188E, 5807651N (September 14, 2022)



Photo A3: Photograph of W2272, an ephemeral waterbody with oat crop. UTM: 12 U 425023E, 5807815N (September 1, 2022)



Photo A4: Photograph of W2398, an ephemeral waterbody with pineapple weed (*Matricaria matricariodes*), red clover (*Trifolium pratense*), timothy (*Phleum pratense*), and stinkweed (*Thlaspi arvense*). UTM: 12 U 429305E, 5808080N (August 31, 2022)



Photo A5: Photograph of W2539, an ephemeral waterbody with barnyard grass (*Echinochloa crus-galli*) and oat crop. UTM: 12U 427077E, 5805458N (September 1, 2022)



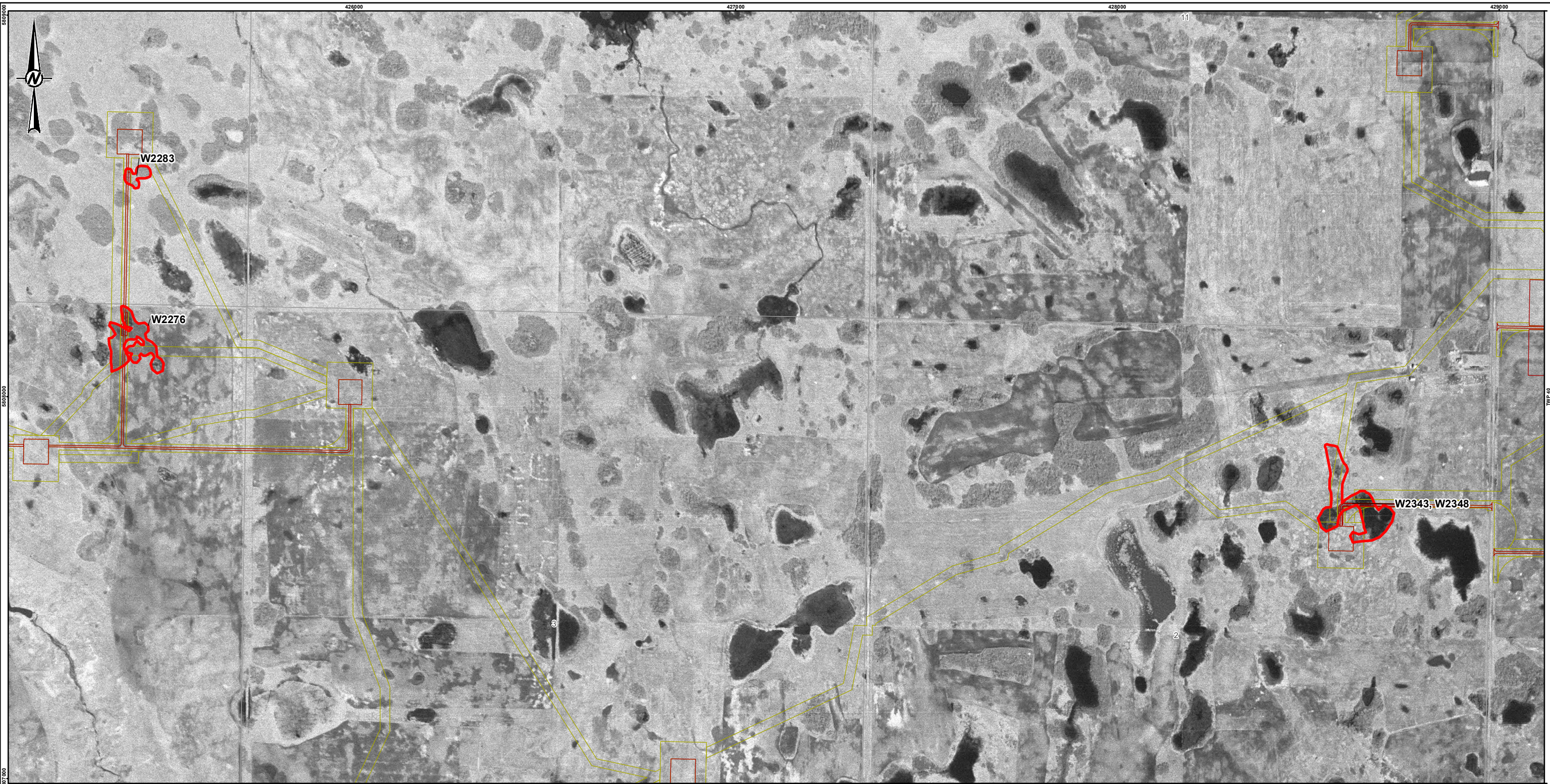
Photo A6: Photograph of W2640, an ephemeral waterbody with nuttall's alkali grass (*Puccinellia nuttalliana*), foxtail barley (*Hordeum jubatum*), and kochia (*Kochia scoparia*). UTM: 12U, 429012E, 5808199N (August 31, 2022)



Photo A7: Photograph of W2641, an ephemeral waterbody with foxtail barley (*Hordeum jubatum*) and kochia (*Kochia scoparia*). UTM: 12 U, 429079E, 5808208N (August 31, 2022)

APPENDIX B

Historical Aerial Photographs



- LEGEND**
- OPERATION FOOTPRINT (PERMANENT IMPACTS)
 - CONSTRUCTION FOOTPRINT (TEMPORARY IMPACTS)
- HISTORICAL WETLAND DELINEATION**
- 1950



NOTE(S)
NA

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DESIGNED	TA
PREPARED	NB
REVIEWED	KLW
APPROVED	KLW

PROJECTION: UTM ZONE 12 DATUM: NAD 83

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HALKIRK 2 WIND POWER PROJECT

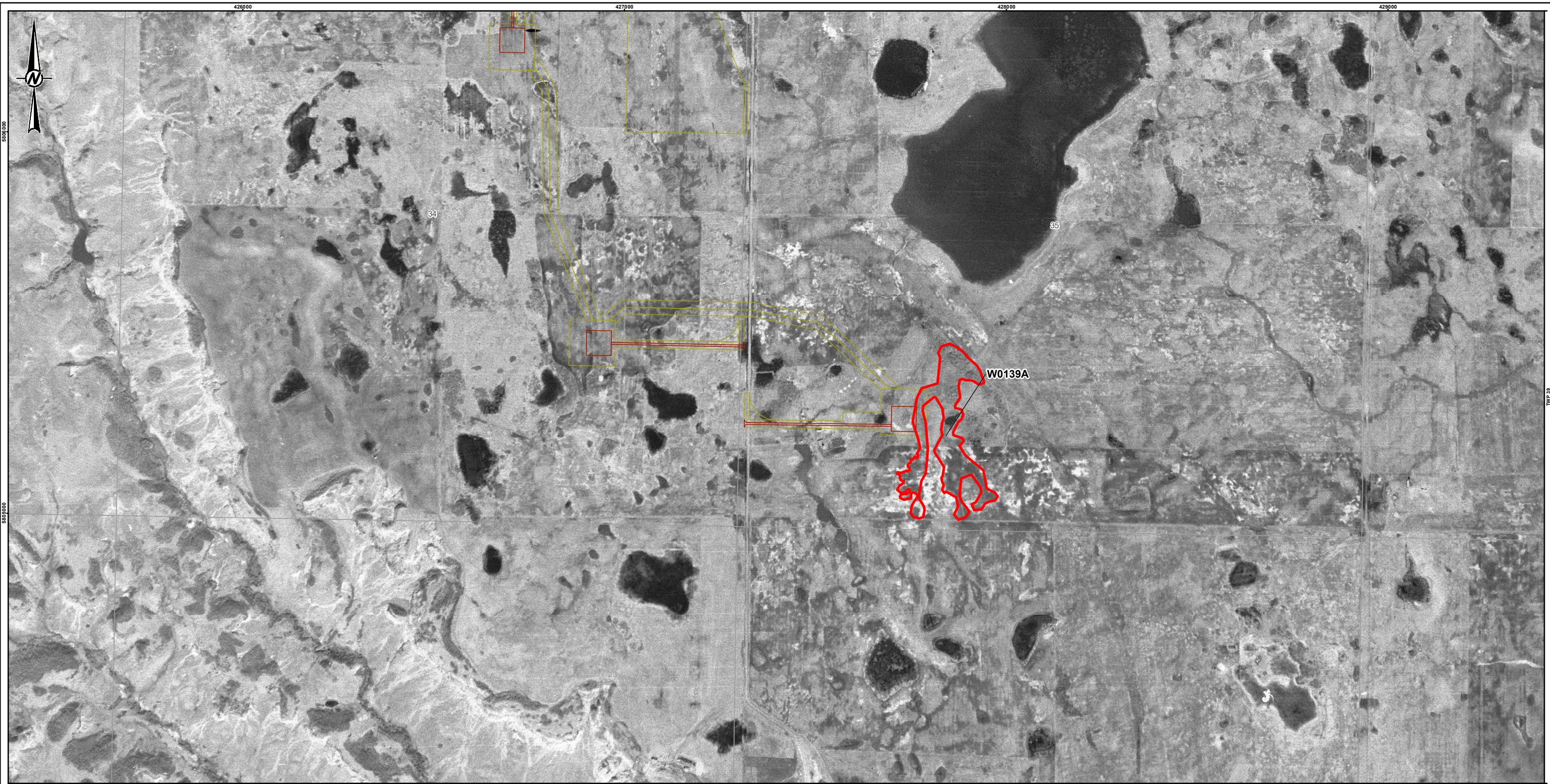
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- LEGEND**
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 - CONSTRUCTION FOOTPRINT (TEMPORARY IMPACTS)
- HISTORICAL WETLAND DELINEATION**
- 1950



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REVIEWED	KLW
APPROVED	KLW

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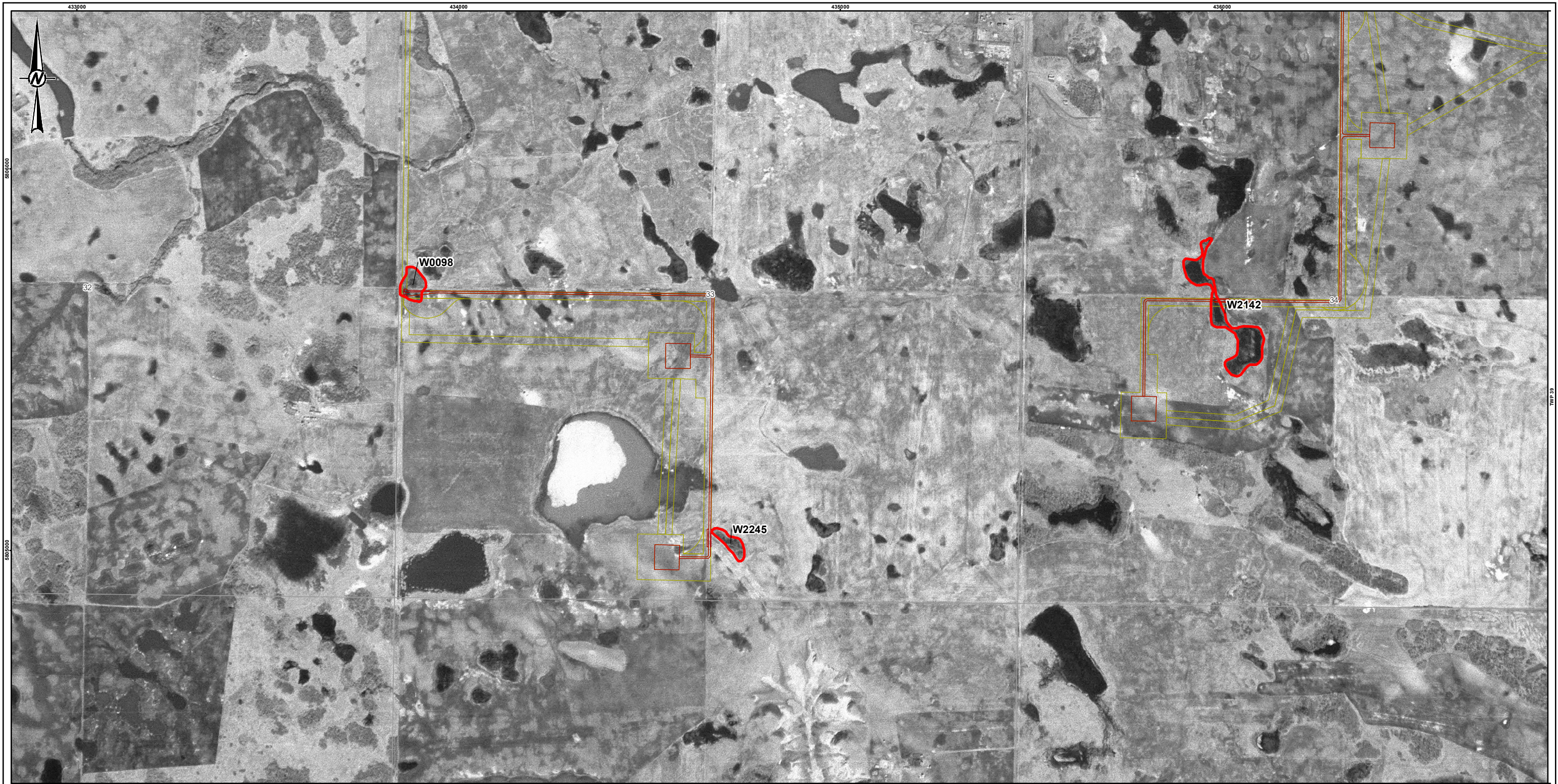
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- LEGEND**
- OPERATION FOOTPRINT (PERMANENT IMPACTS)
 - CONSTRUCTION FOOTPRINT (TEMPORARY IMPACTS)
- HISTORICAL WETLAND DELINEATION**
- 1950



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PREPARED	NB
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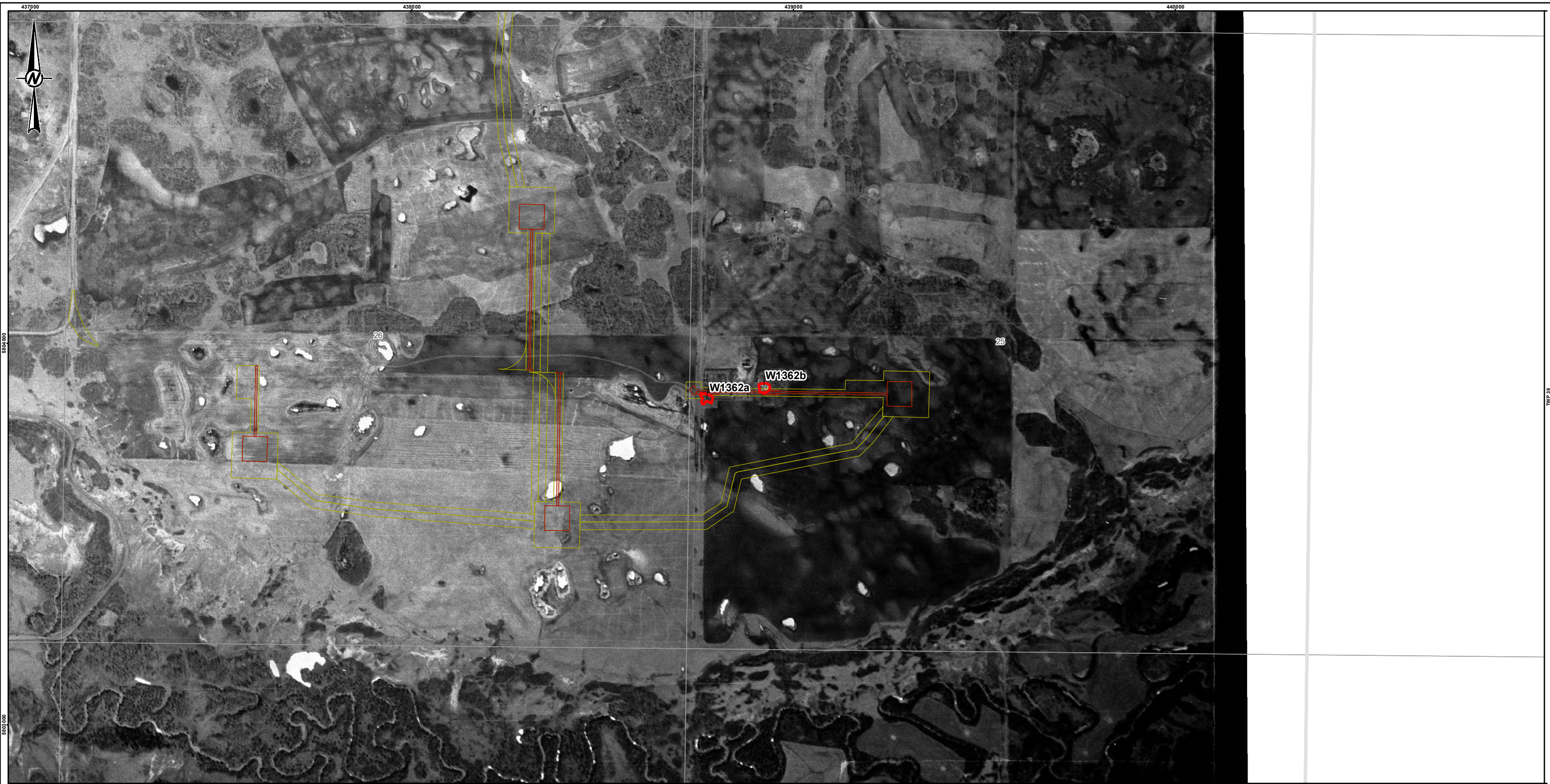
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TITLE
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- LEGEND**
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 - CONSTRUCTION FOOTPRINT (TEMPORARY IMPACTS)
- HISTORICAL WETLAND DELINEATION**
- 1950



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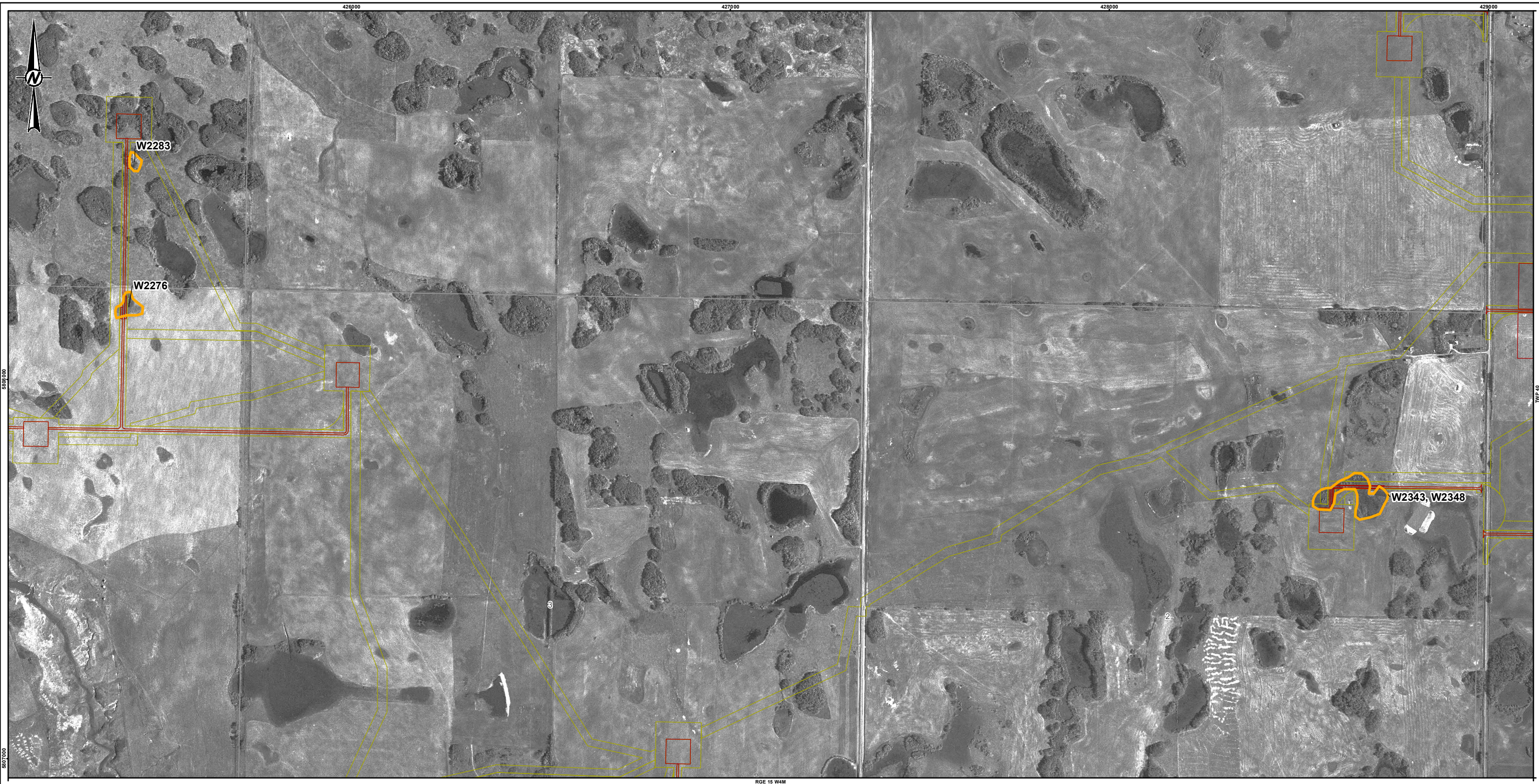


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TITLE			
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LEGEND
 OPERATION FOOTPRINT (PERMANENT IMPACTS)
 CONSTRUCTION FOOTPRINT (TEMPORARY IMPACTS)
HISTORICAL WETLAND DELINEATION
 1963



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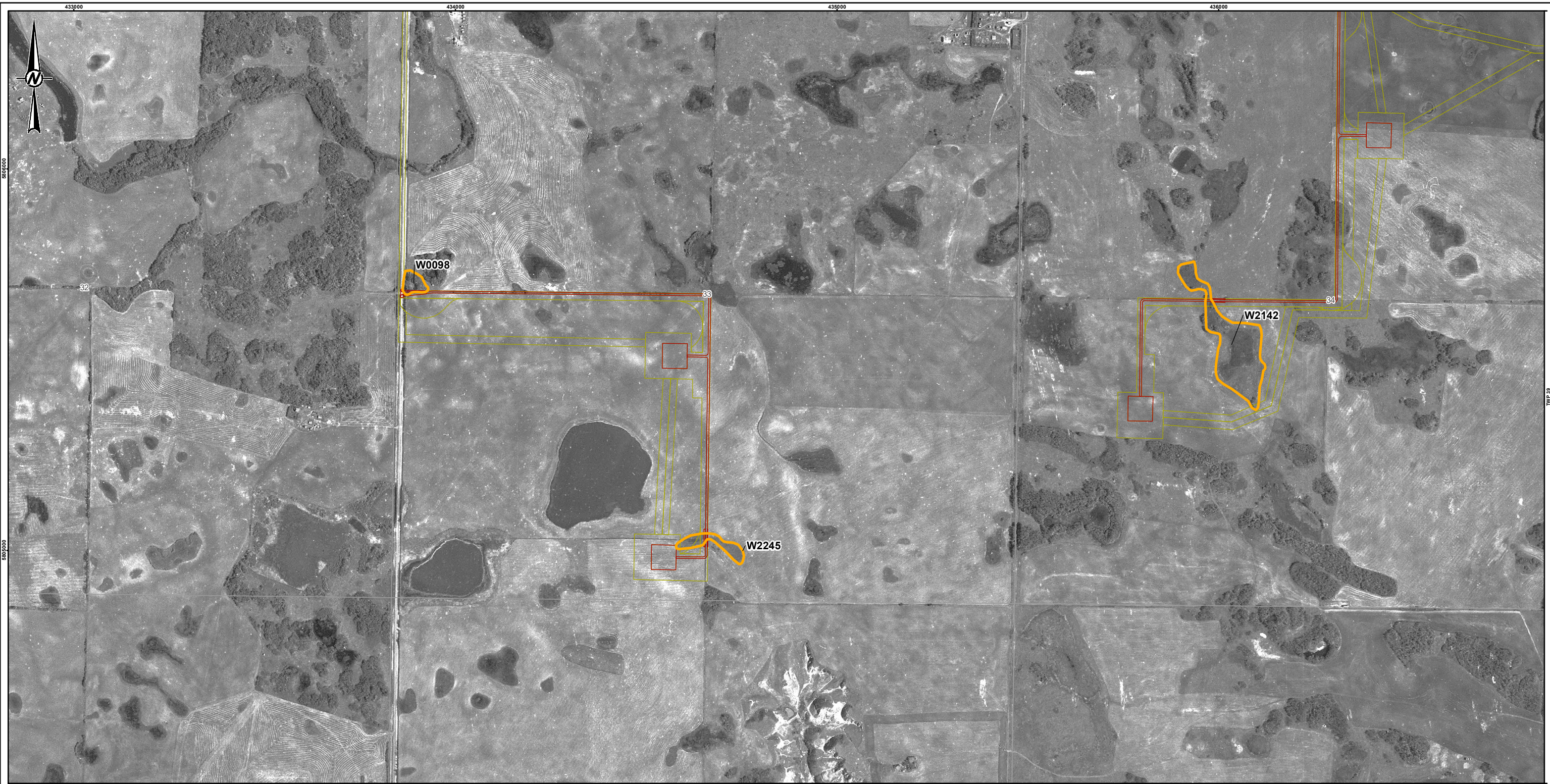
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TITLE
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- LEGEND**
- OPERATION FOOTPRINT (PERMANENT IMPACTS)
 - CONSTRUCTION FOOTPRINT (TEMPORARY IMPACTS)
- HISTORICAL WETLAND DELINEATION**
- 1963



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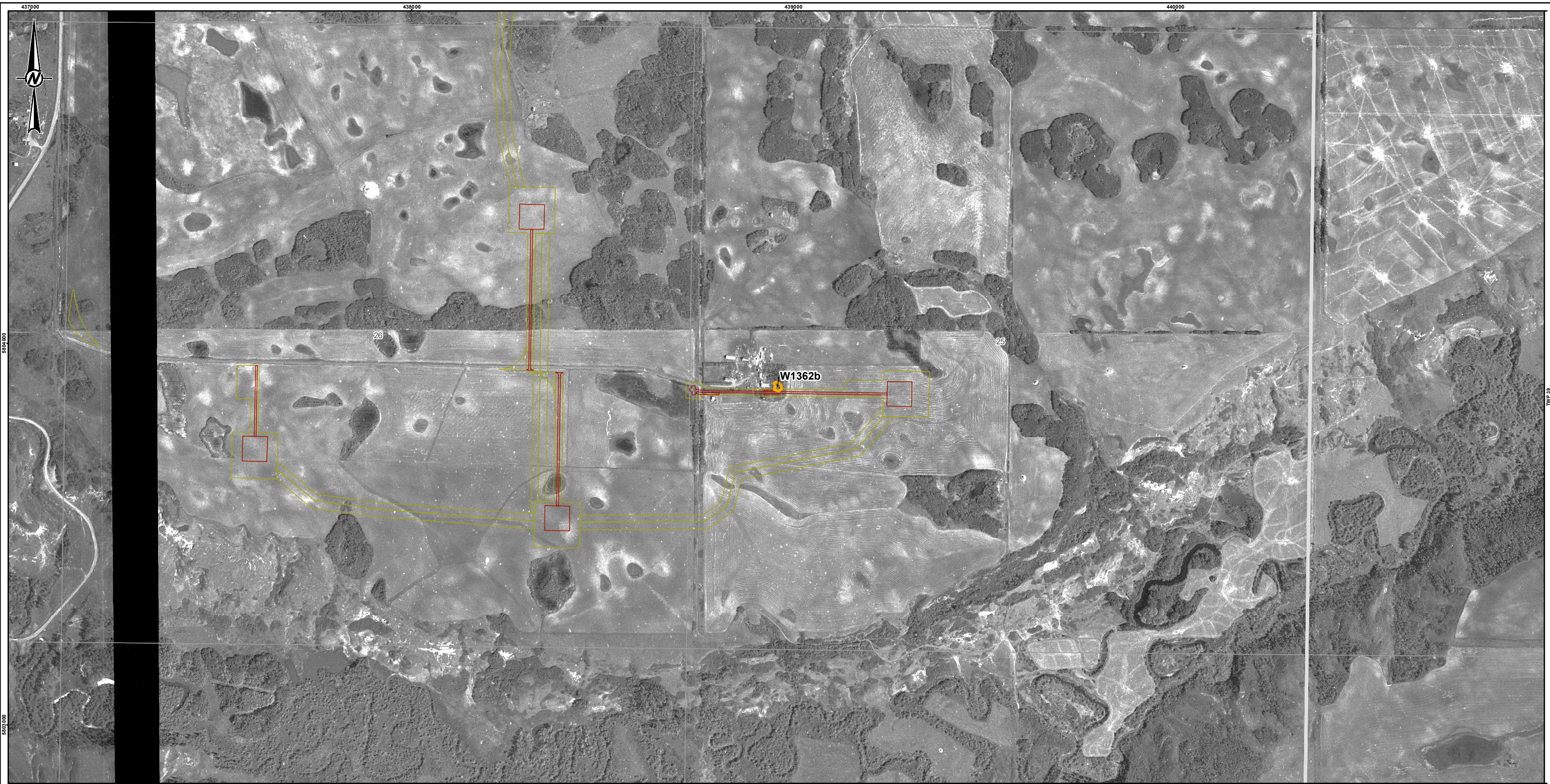
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LEGEND

OPERATION FOOTPRINT (PERMANENT IMPACTS)
 CONSTRUCTION FOOTPRINT (TEMPORARY IMPACTS)
 HISTORICAL WETLAND DELINEATION
 1963



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TITLE
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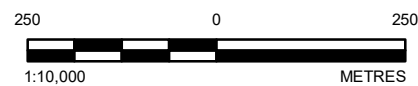
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- LEGEND**
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 - CONSTRUCTION FOOTPRINT (TEMPORARY IMPACTS)
- HISTORICAL WETLAND DELINEATION**
- 1970



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PROJECTION: UTM ZONE 12 DATUM: NAD 83
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TITLE
HISTORICAL WETLAND DELINEATION - 1970

PROJECT NO.	CONTROL	REV.	FIGURE
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IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B



- LEGEND**
- OPERATION FOOTPRINT (PERMANENT IMPACTS)
 - CONSTRUCTION FOOTPRINT (TEMPORARY IMPACTS)
- HISTORICAL WETLAND DELINEATION**
- 1970



NOTE(S)
NA

REFERENCE(S)
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YYYY-MM-DD	2023-03-01
DESIGNED	TA
PREPARED	NB
REVIEWED	KLW
APPROVED	KLW

PROJECTION: UTM ZONE 12 DATUM: NAD 83

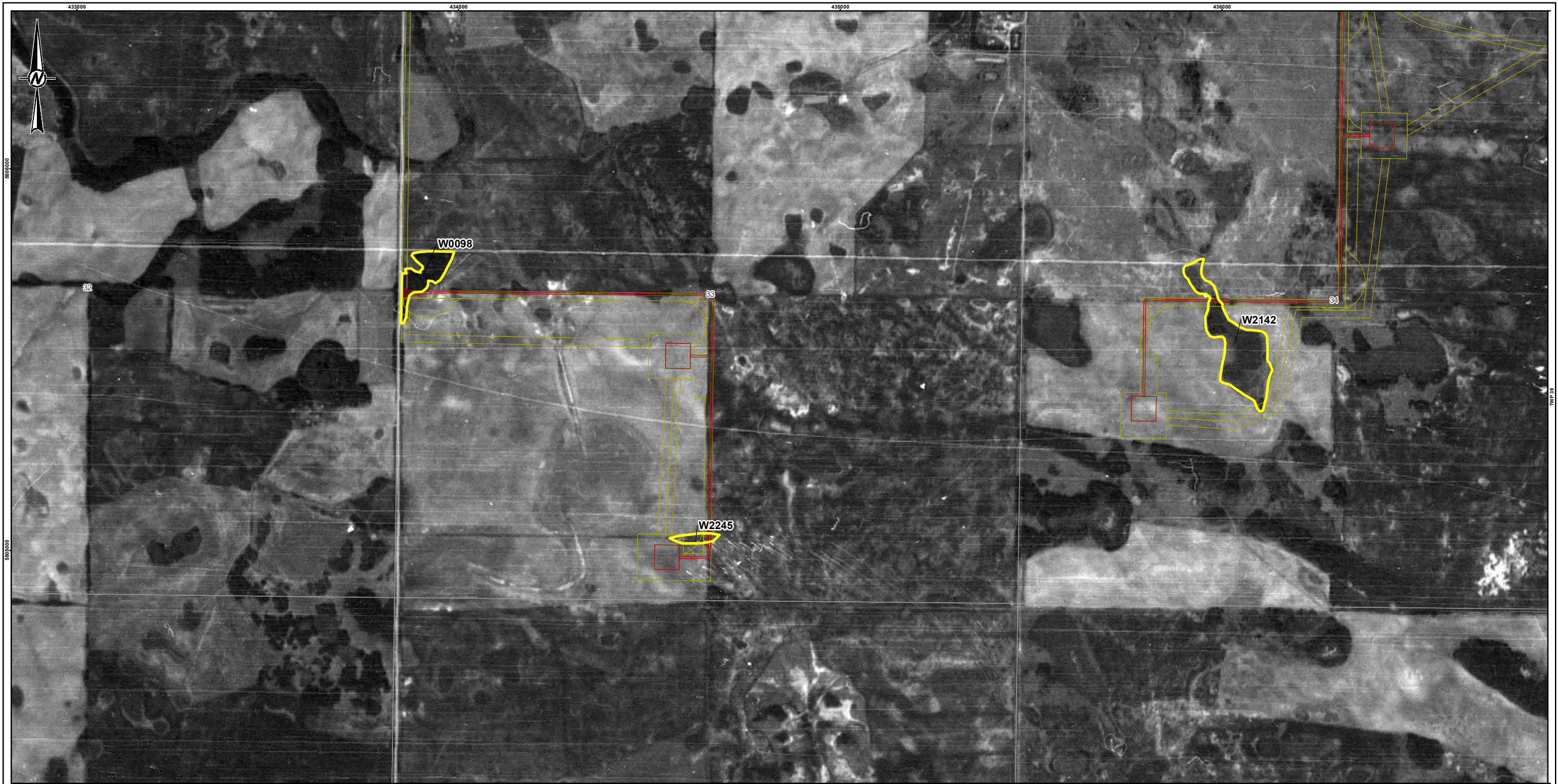
PROJECT
HALKIRK 2 WIND POWER PROJECT

TITLE
HISTORICAL WETLAND DELINEATION - 1970

PROJECT NO.	CONTROL	REV.	FIGURE
21451763		0	B-9

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IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B



- LEGEND**
- OPERATION FOOTPRINT (PERMANENT IMPACTS)
 - CONSTRUCTION FOOTPRINT (TEMPORARY IMPACTS)
- HISTORICAL WETLAND DELINEATION**
- 1970



NOTE(S)
NA

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REVIEWED	KLW
APPROVED	KLW

PROJECTION: UTM ZONE 12 DATUM: NAD 83

PROJECT
HALKIRK 2 WIND POWER PROJECT

TITLE
HISTORICAL WETLAND DELINEATION - 1970

PROJECT NO.	CONTROL	REV.	FIGURE
21451763		0	B-10

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IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANS B 28mm



LEGEND

OPERATION FOOTPRINT (PERMANENT IMPACTS)
 CONSTRUCTION FOOTPRINT (TEMPORARY IMPACTS)

HISTORICAL WETLAND DELINEATION

1970



NOTE(S)
NA

REFERENCE(S)
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PREPARED	NB
REVIEWED	KLW
APPROVED	KLW

PROJECTION: UTM ZONE 12 DATUM: NAD 83

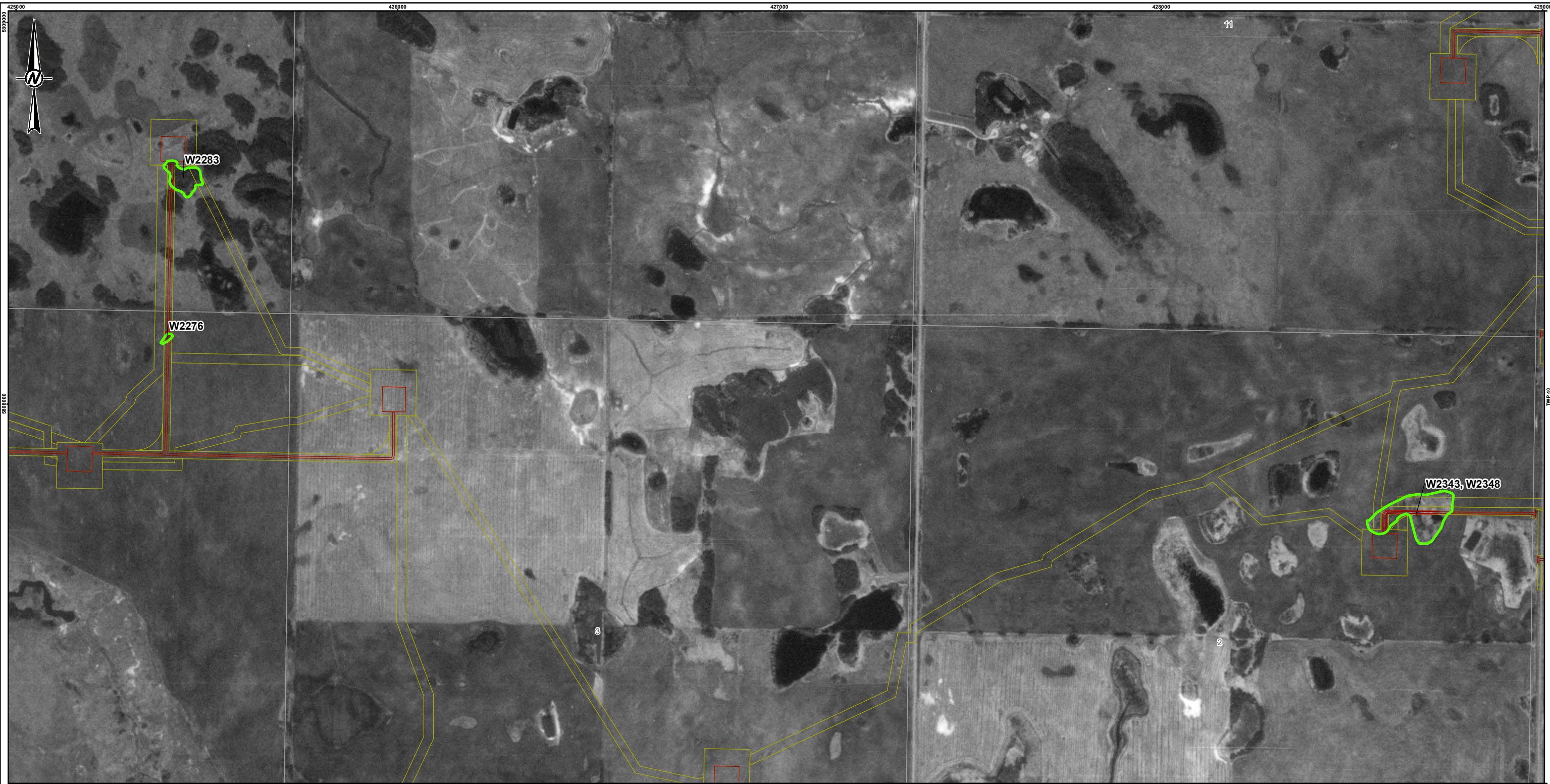
PROJECT
HALKIRK 2 WIND POWER PROJECT

TITLE
HISTORICAL WETLAND DELINEATION - 1970

PROJECT NO.	CONTROL	REV.	FIGURE
21451763		0	B-11

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IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B



LEGEND

OPERATION FOOTPRINT (PERMANENT IMPACTS)
 CONSTRUCTION FOOTPRINT (TEMPORARY IMPACTS)
HISTORICAL WETLAND DELINEATION
 1980



NOTE(S)
NA

REFERENCE(S)
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DESIGNED	TA
PREPARED	NB
REVIEWED	KLW
APPROVED	KLW

PROJECTION: UTM ZONE 12 DATUM: NAD 83

PROJECT

HALKIRK 2 WIND POWER PROJECT

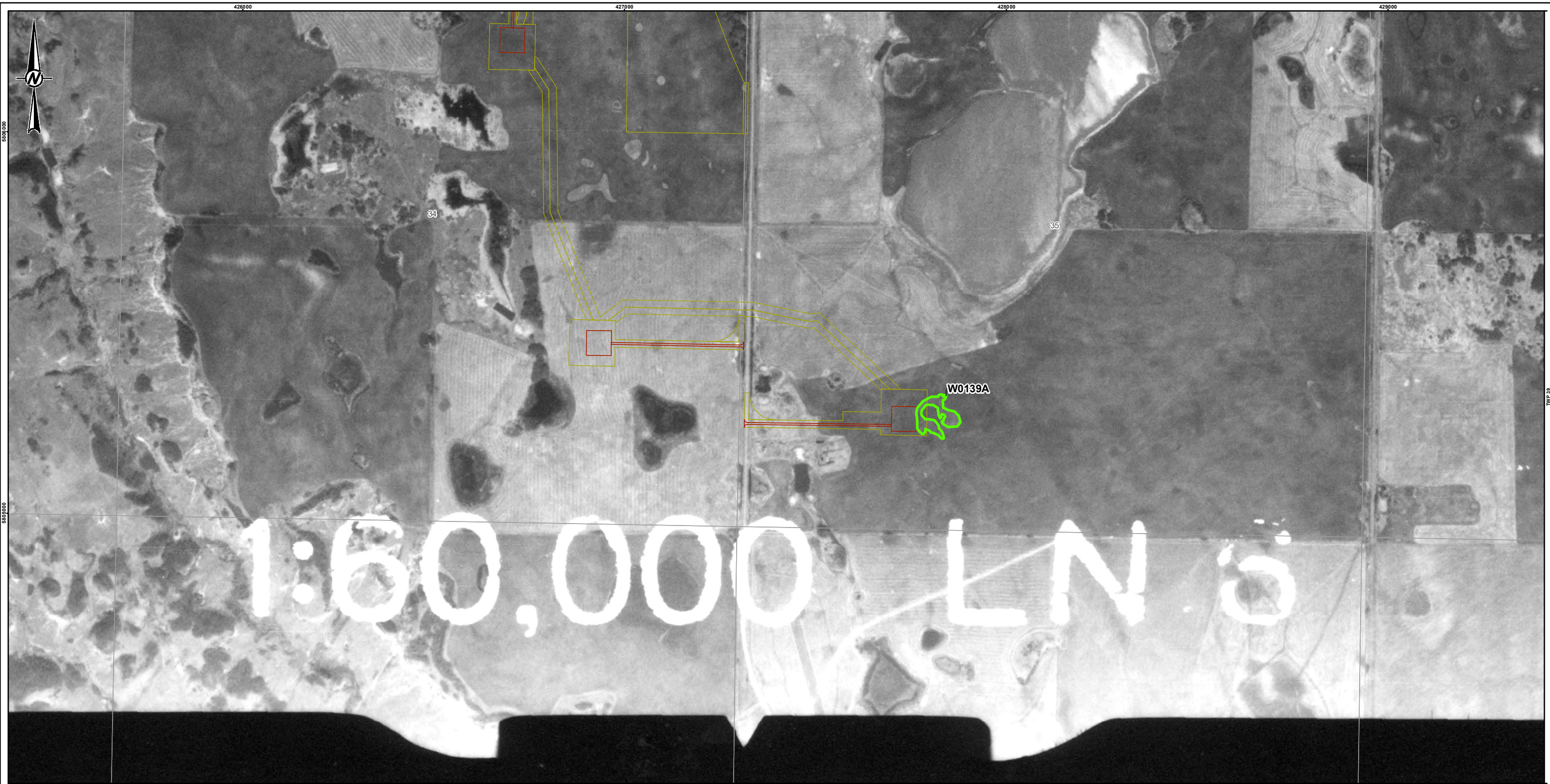
TITLE

HISTORICAL WETLAND DELINEATION - 1980

PROJECT NO.	CONTROL	REV.	FIGURE
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IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B



- LEGEND**
- OPERATION FOOTPRINT (PERMANENT IMPACTS)
 - CONSTRUCTION FOOTPRINT (TEMPORARY IMPACTS)
- HISTORICAL WETLAND DELINEATION**
- 1980



NOTE(S)
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PROJECTION: UTM ZONE 12 DATUM: NAD 83

PROJECT
HALKIRK 2 WIND POWER PROJECT

TITLE
HISTORICAL WETLAND DELINEATION - 1980

PROJECT NO. 21451763	CONTROL	REV. 0	FIGURE B-13
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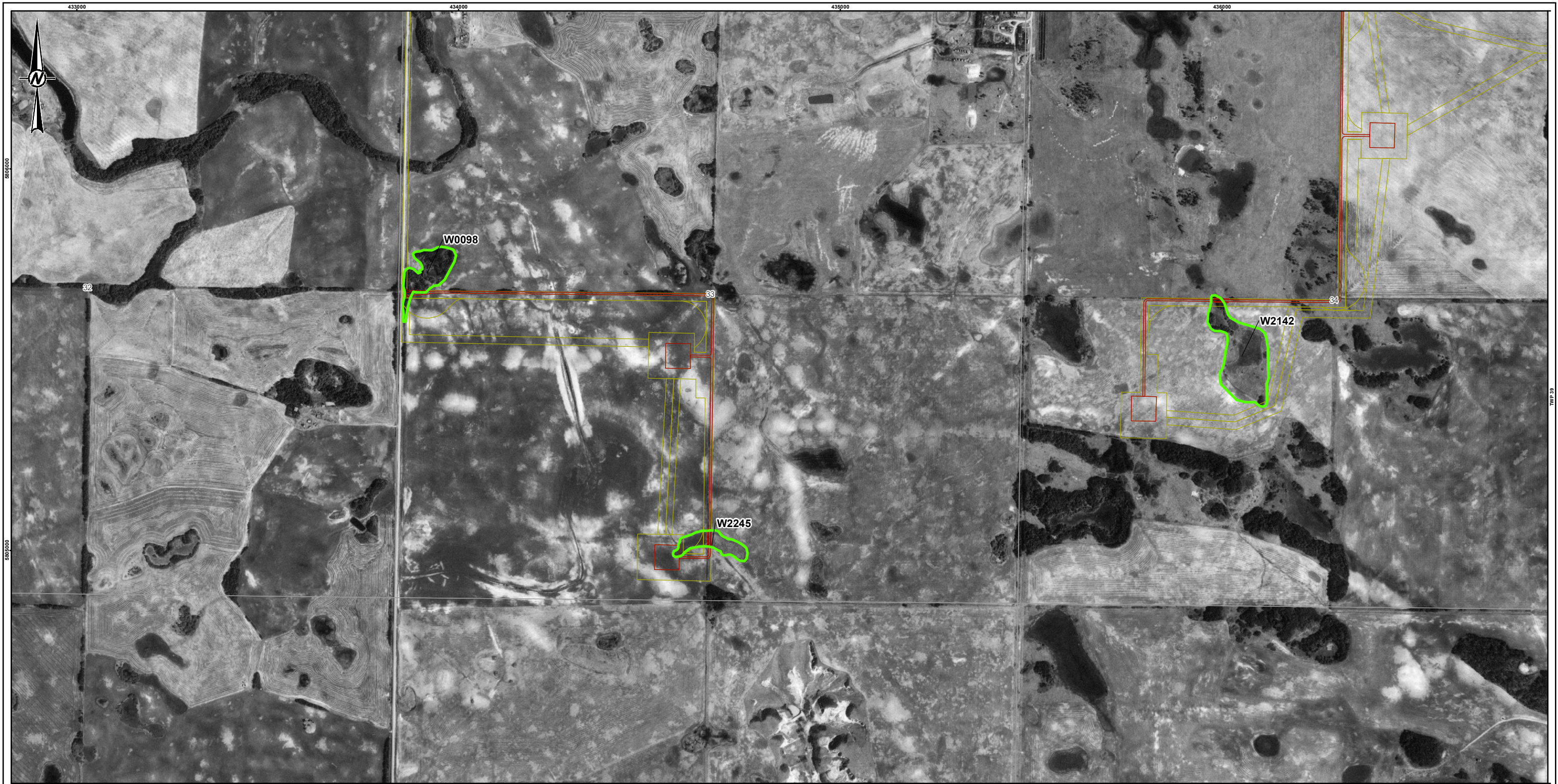
CLIENT
Capital Power

CONSULTANT
wsp

YYYY-MM-DD	2023-03-01
DESIGNED	TA
PREPARED	NB
REVIEWED	KLW
APPROVED	KLW

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IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B



- LEGEND**
- OPERATION FOOTPRINT (PERMANENT IMPACTS)
 - CONSTRUCTION FOOTPRINT (TEMPORARY IMPACTS)
- HISTORICAL WETLAND DELINEATION**
- 1980

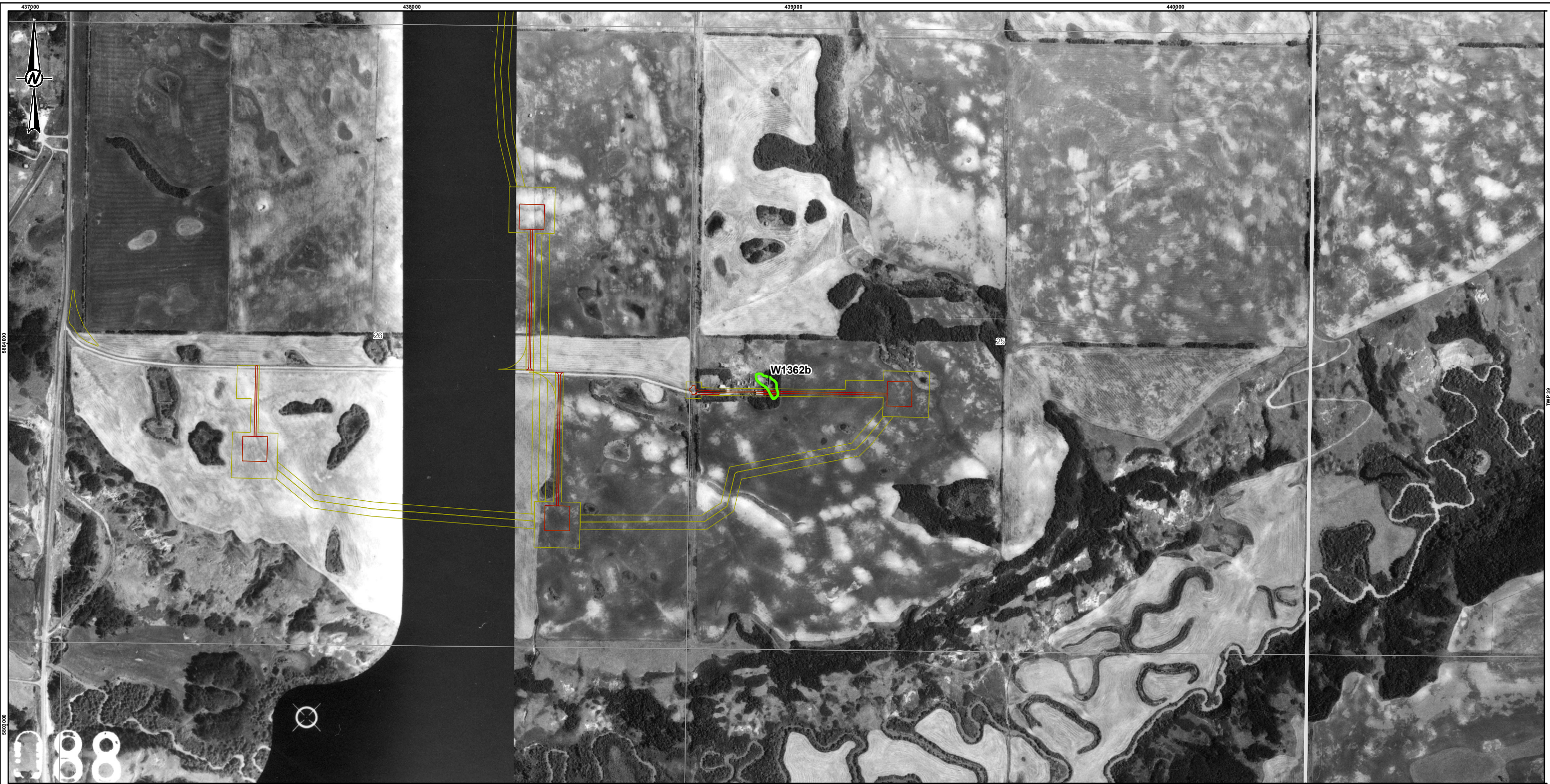


NOTE(S)	
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REFERENCE(S)	
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HALKIRK 2 WIND POWER PROJECT	
TITLE	
HISTORICAL WETLAND DELINEATION - 1980	
PROJECT NO.	CONTROL
21451763	
REV.	0

CLIENT	Capital Power	
CONSULTANT	YYYY-MM-DD	2023-03-01
	DESIGNED	TA
	PREPARED	NB
	REVIEWED	KLW
	APPROVED	KLW

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IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B



- LEGEND**
- OPERATION FOOTPRINT (PERMANENT IMPACTS)
 - CONSTRUCTION FOOTPRINT (TEMPORARY IMPACTS)
- HISTORICAL WETLAND DELINEATION**
- 1980



NOTE(S)
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PROJECTION: UTM ZONE 12 DATUM: NAD 83

PROJECT
HALKIRK 2 WIND POWER PROJECT

TITLE
HISTORICAL WETLAND DELINEATION - 1980

PROJECT NO.	CONTROL	REV.	FIGURE
21451763		0	B-15

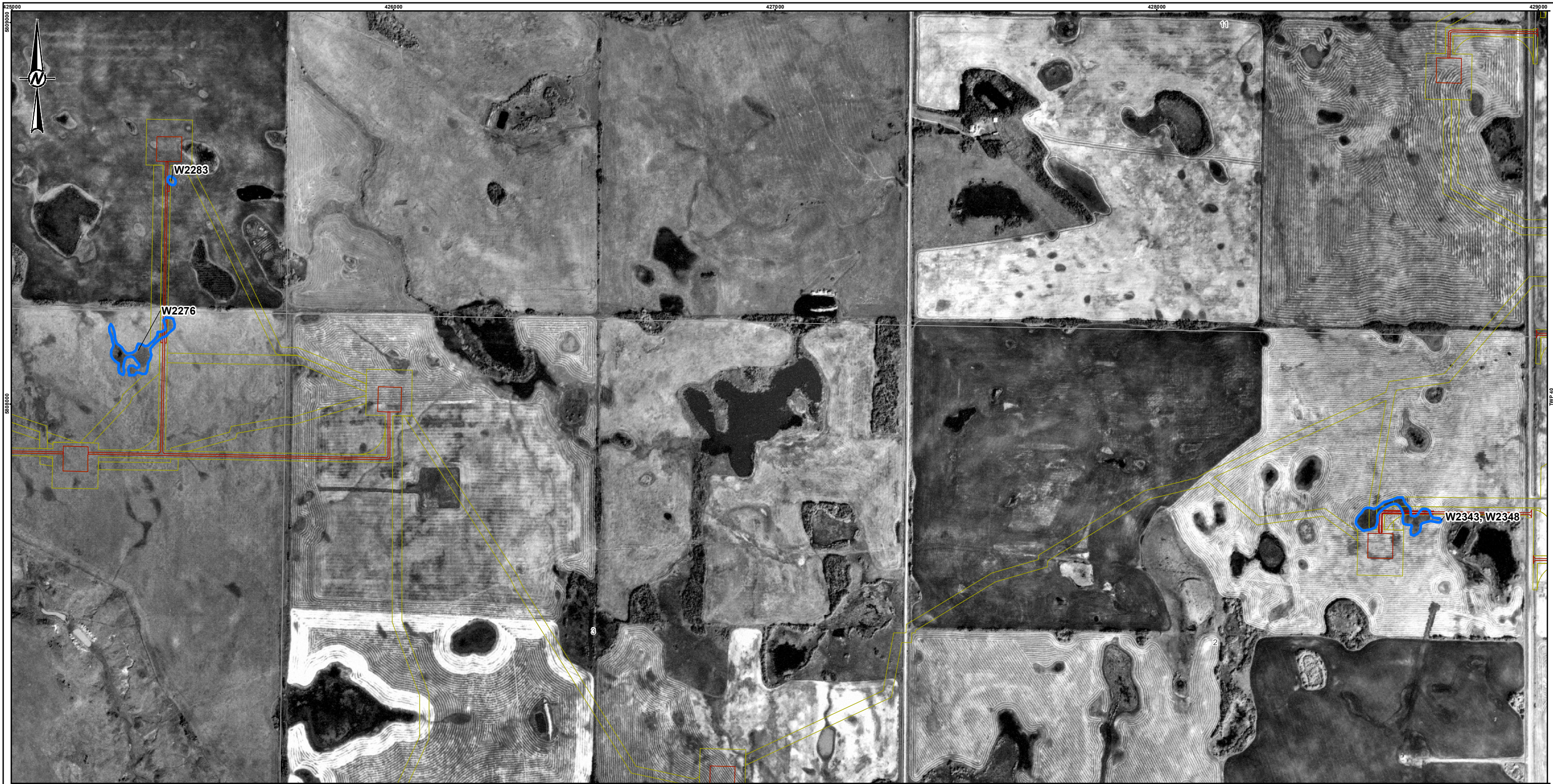
CLIENT
Capital Power

CONSULTANT
wsp

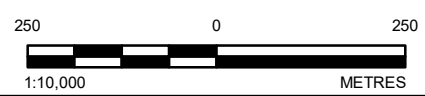
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DESIGNED	TA
PREPARED	NB
REVIEWED	KLW
APPROVED	KLW

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IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B



- LEGEND**
- OPERATION FOOTPRINT (PERMANENT IMPACTS)
 - CONSTRUCTION FOOTPRINT (TEMPORARY IMPACTS)
- HISTORICAL WETLAND DELINEATION**
- 1993



NOTE(S)			
NA			
REFERENCE(S)			
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PROJECTION: UTM ZONE 12 DATUM: NAD 83			
PROJECT			
HALKIRK 2 WIND POWER PROJECT			
TITLE			
HISTORICAL WETLAND DELINEATION - 1993			
PROJECT NO.	CONTROL	REV.	FIGURE
21451763		0	B-16

CLIENT

Capital Power

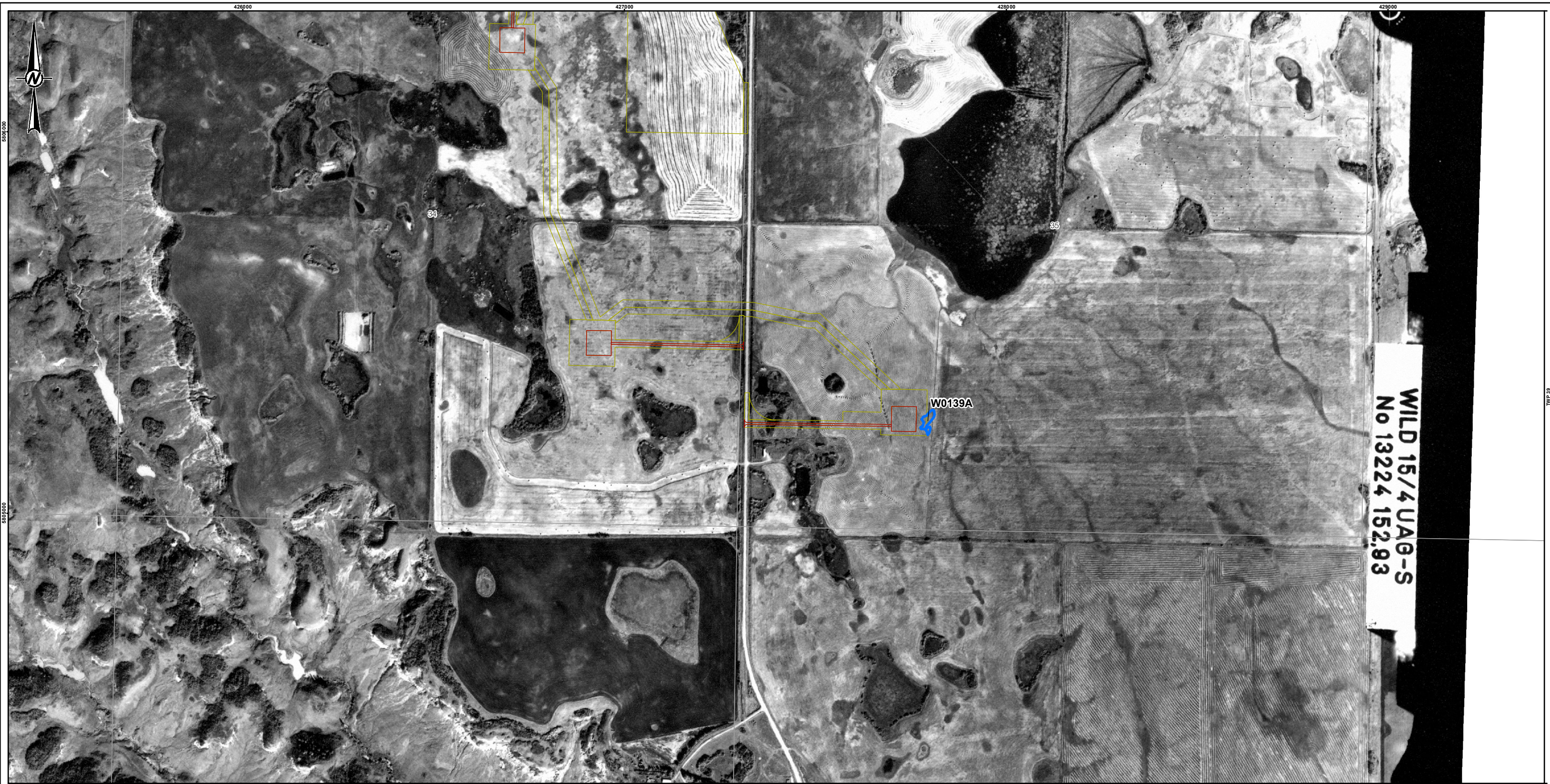
CONSULTANT

WSP

YYYY-MM-DD	2023-03-01
DESIGNED	TA
PREPARED	NB
REVIEWED	KLW
APPROVED	KLW

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IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: A4 (B) 297mm



LEGEND

OPERATION FOOTPRINT (PERMANENT IMPACTS)
 CONSTRUCTION FOOTPRINT (TEMPORARY IMPACTS)
 HISTORICAL WETLAND DELINEATION
 1993



NOTE(S)
NA

REFERENCE(S)
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PROJECTION: UTM ZONE 12 DATUM: NAD 83

PROJECT
HALKIRK 2 WIND POWER PROJECT

TITLE
HISTORICAL WETLAND DELINEATION - 1993

PROJECT NO. 21451763	CONTROL	REV. 0	FIGURE B-17
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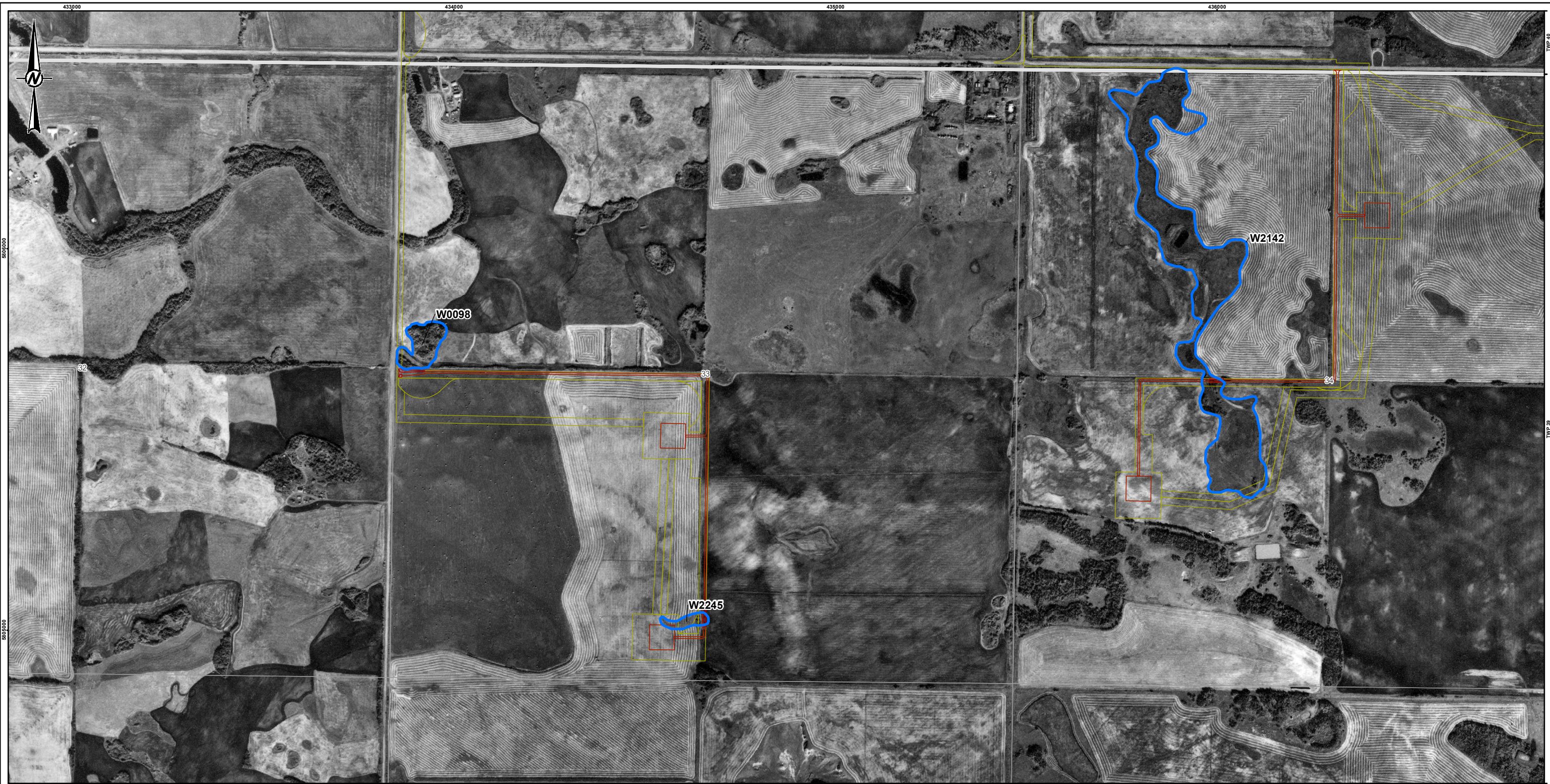
CLIENT
Capital Power

CONSULTANT
wsp

YYYY-MM-DD	2023-03-01
DESIGNED	TA
PREPARED	NB
REVIEWED	KLW
APPROVED	KLW

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IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B



LEGEND

OPERATION FOOTPRINT (PERMANENT IMPACTS)
 CONSTRUCTION FOOTPRINT (TEMPORARY IMPACTS)

HISTORICAL WETLAND DELINEATION

1993



NOTE(S)
NA

REFERENCE(S)
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PROJECTION: UTM ZONE 12 DATUM: NAD 83

PROJECT
HALKIRK 2 WIND POWER PROJECT

TITLE
HISTORICAL WETLAND DELINEATION - 1993

PROJECT NO. 21451763	CONTROL	REV. 0	FIGURE B-18
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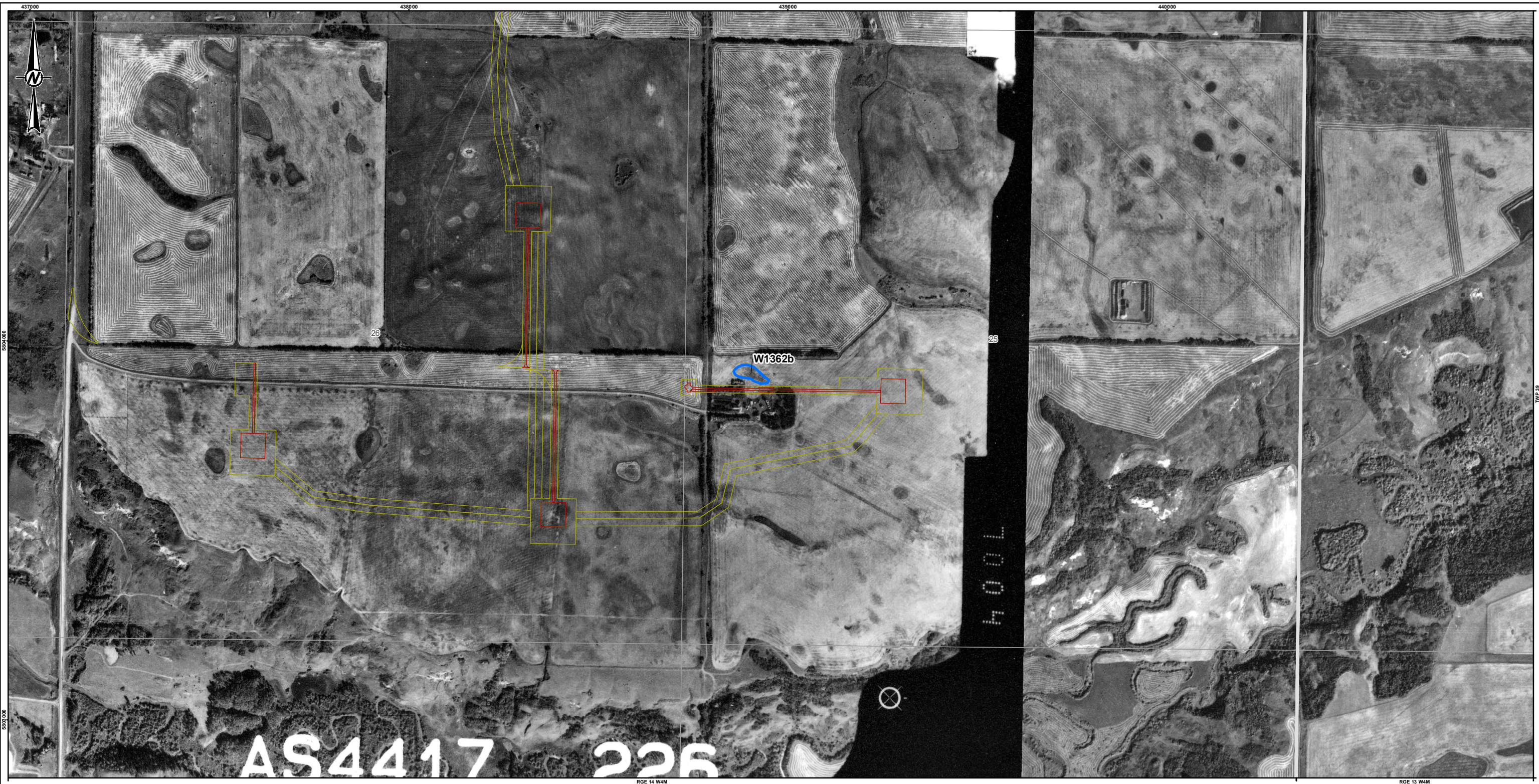
CLIENT

CONSULTANT

YYYY-MM-DD	2023-03-01
DESIGNED	TA
PREPARED	NB
REVIEWED	KLW
APPROVED	KLW

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IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B




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- LEGEND**
- OPERATION FOOTPRINT (PERMANENT IMPACTS)
 - CONSTRUCTION FOOTPRINT (TEMPORARY IMPACTS)
- HISTORICAL WETLAND DELINEATION**
- 1993



CLIENT



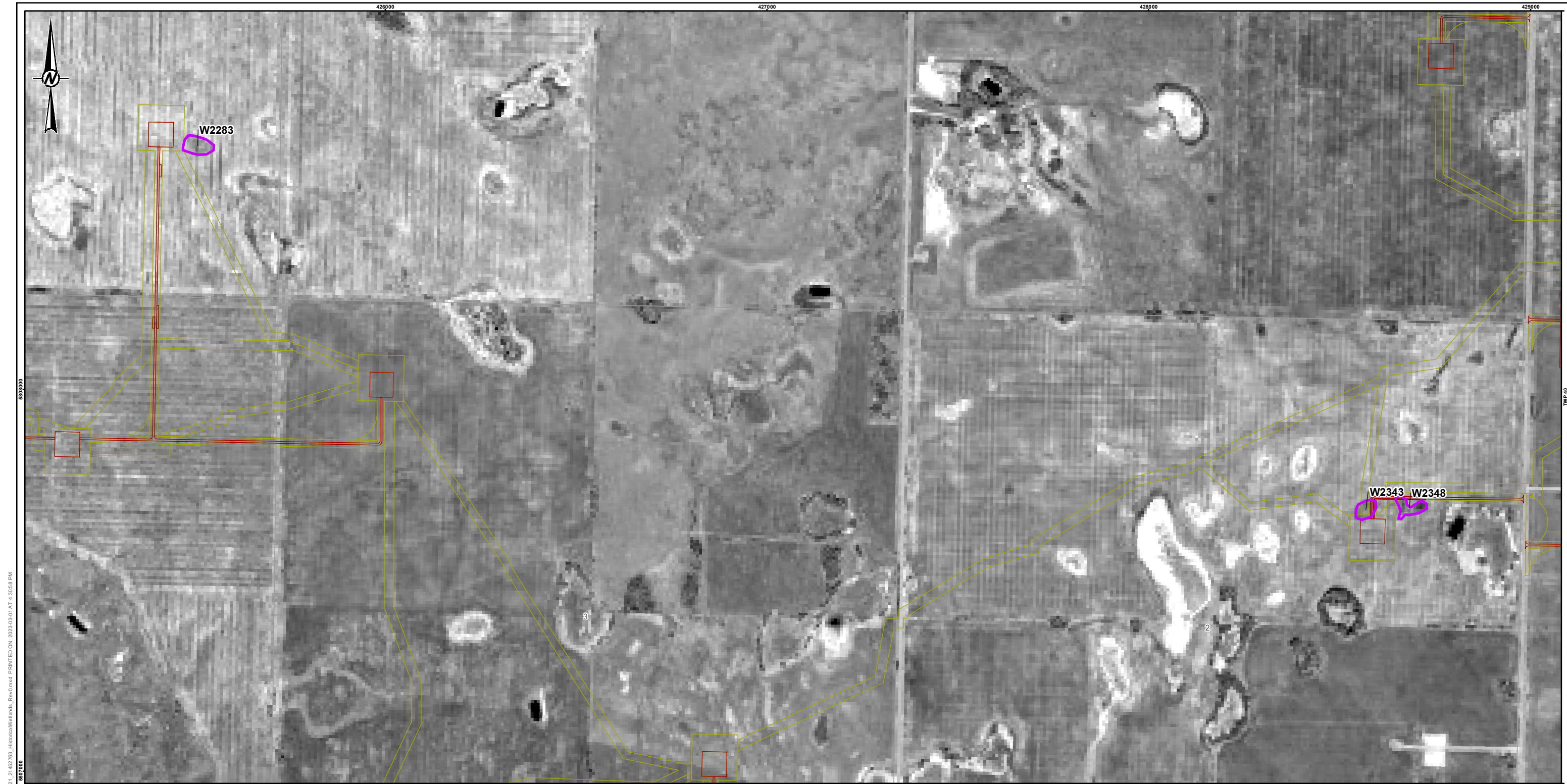
CONSULTANT



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PREPARED	NB
REVIEWED	KLW
APPROVED	KLW

NOTE(S)	
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REFERENCE(S)	
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PROJECTION: UTM ZONE 12 DATUM: NAD 83	
PROJECT	
HALKIRK 2 WIND POWER PROJECT	
TITLE	
HISTORICAL WETLAND DELINEATION - 1993	
PROJECT NO.	CONTROL
21451763	
REV.	0
FIGURE	B-19

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B



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- LEGEND**
- OPERATION FOOTPRINT (PERMANENT IMPACTS)
 - CONSTRUCTION FOOTPRINT (TEMPORARY IMPACTS)
- HISTORICAL WETLAND DELINEATION**
- 2009



CLIENT
Capital Power

CONSULTANT
wsp

YYYY-MM-DD	2023-03-01
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PREPARED	NB
REVIEWED	KLW
APPROVED	KLW

NOTE(S)
 DUE TO LACK OF SUFFICIENT COVERAGE OF THE 1993 IMAGERY, WETLANDS ARE PARTIALLY DELINEATED FOR THIS YEAR.

REFERENCE(S)
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PROJECTION: UTM ZONE 12 DATUM: NAD 83
 PROJECT
HALKIRK 2 WIND POWER PROJECT

TITLE
HISTORICAL WETLAND DELINEATION - 2009

PROJECT NO.	CONTROL	REV.	FIGURE
21451763		0	B-20

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B



- LEGEND**
- OPERATION FOOTPRINT (PERMANENT IMPACTS)
 - CONSTRUCTION FOOTPRINT (TEMPORARY IMPACTS)
- HISTORICAL WETLAND DELINEATION**
- 2009



YYYY-MM-DD	2023-03-01
DESIGNED	TA
PREPARED	NB
REVIEWED	KLW
APPROVED	KLW

NOTE(S)
DUE TO LACK OF SUFFICIENT COVERAGE OF THE 1993 IMAGERY, WETLANDS ARE PARTIALLY DELINEATED FOR THIS YEAR.

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PROJECTION: UTM ZONE 12 DATUM: NAD 83

PROJECT
HALKIRK 2 WIND POWER PROJECT

TITLE
HISTORICAL WETLAND DELINEATION - 2009

PROJECT NO.	CONTROL	REV.
21451763		0

FIGURE
B-21

PATH: I:\CLIENT\CAPITAL_POWER\21451763\Maping\Products\Wetland\W0139A_21451763_Muskeg\Wetlands_Rev0.mxd. PRINTED ON: 2023-03-01 AT: 4:31:02 PM

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

APPENDIX C

Wetland Photographs



Photo C-1: Photograph of W2142, a seasonal graminoid marsh, M-G (III) dominated by Kentucky bluegrass (*Poa pratensis*), reed canary grass (*Phalaris arundinacea*), smooth brome (*Bromus inermis*), and foxtail barley (*Hordeum jubatum*). UTM: 12U, 435985N/5805652 (August 28, 2022)



Photo C-2: Photograph of a soil test pit in W2142 consisting of a silty clay loam. UTM: 12U, 435985N/5805652 (August 28, 2022)



Photo C-3: Photograph of W2245, a seasonal graminoid marsh, M-G (III) dominated by smooth brome (*Bromus inermis*) and reed canary grass (*Phalaris arundinacea*). UTM: 12U, 434652E/5805028N (September 14, 2022)



Photo C-4: Photograph of a soil test pit in W2245 consisting of silty clay and mottles at 15 cm. UTM: 12U, 434652E/5805028N (September 14, 2022)



Photo C-5: Photograph of W2343, a seasonal graminoid marsh, M-G (III) dominated by pale persicaria (*Persicaria lapathifolia*), broad leaved water plantain (*Alisma triviale*), and barnyard grass (*Echinochloa crusgalli*). UTM: 12U, 428550E/5807699N (September 25, 2022)



Photo C-6: Photograph a soil test pit in W2343 consisting of loam with mottling at 4 cm and gleying at 19 cm. UTM: 12U, 428550E/5807699N (September 25, 2022)



Photo C-7: Photograph of W2348, a seasonal graminoid marsh, M-G (III) dominated by common cattail (*Typha latifolia*), broad-leaved water plantain (*Alisma triviale*) and water smartweed (*Persicaria amphibia*). UTM: 12U, 428712E/5807705N (August 27, 2022)



Photo C-8: Photograph of a soil test pit in W2348 consisting of silty clay loam with mottling at 4 cm and gleying at 7 cm. UTM: 12U, 428712E/5807705N (August 27, 2022)



Photo C-9: Photograph of W0098, a temporary graminoid marsh, M-G (II) dominated by foxtail barley (*Hordeum jubatum*). UTM: 12U, 433868E/ 5805680N (August 30, 2022)



Photo C-10: Photograph of a soil test pit in W0098 consisting of clay. UTM: 12U, 433868E/ 5805680N (August 30, 2022)



Photo C-11: Photograph of W0139A, a temporary graminoid marsh, M-G (II) dominated by foxtail barley (*Hordeum jubatum*) and fowl bluegrass (*Poa palustris*). UTM: 12U, 427776E/5805226N (September 25, 2022)



Photo C-12: Photograph of W1362A, a temporary graminoid marsh, M-G (II) dominated by cultivated barley (*Hordeum vulgare*). UTM: 12U, 438772E/5803851N (August 27, 2022)



Photograph C-13: Photograph of a soil test pit in W1362A consisting of silty clay loam. UTM: 12U, 438772E/5803851N (August 27, 2022)



Photograph C-14: Photograph of W1362b, a temporary graminoid marsh, M-G (II) dominated by cultivated barley (*Hordeum vulgare*). UTM: 12U, 438938E/ 5803898N (September 14, 2022)



Photograph C-15: Photograph of soil test pit in W1362b consisting of silty clay loam. UTM: 12U, 438938E/5803898N (September 14, 2022)



Photograph C-16: Photograph of W2283, a temporary graminoid marsh, M-G (II) dominated by barnyard grass (*Echinochloa crusgalli*) and common cattail (*Typha latifolia*). UTM: 12U, 434652E/5805028N (September 1, 2022)



Photograph C-17: Photograph of soil test pit in W2283. UTM: 12U, 434652E/5805028N (September 1, 2022)

No photos were taken for Wetland W2276.

APPENDIX D

Desktop Searches

Date: 25/1/2023

Requestor: Consultant

Reason for Request: Permitting

SEC: -- TWP: 039 RGE: 14 MER: 4



■ Non-sensitive EOs (updated: June 2022)

M_RR_TTT_SS	EO_ID	ECODE	S_RANK	SNAME	SCOMNAME	LAST_OBS_D
4-14-039-25	24560	PDSCR0R070	S3	Gratiola neglecta	clammy hedge-hyssop	2011-08-20

Next Steps: See FAQ (<https://www.albertaparks.ca/albertaparksca/management-land-use/alberta-conservation-information-management-system-acims/faqs.aspx#2> - Process)

■ Sensitive EOs (updated: June 2022)

M-RR-TTT	EO_ID	ECODE	S_RANK	SNAME	SCOMNAME	LAST_OBS_D
----------	-------	-------	--------	-------	----------	------------

No Sensitive EOs Found: Next Steps - See FAQ (<https://www.albertaparks.ca/albertaparksca/management-land-use/alberta-conservation-information-management-system-acims/faqs.aspx#2> - Process)

Date: 25/1/2023

Requestor: Consultant

Reason for Request: Permitting

SEC: -- **TWP:** 039 **RGE:** 15 **MER:** 4



■ Non-sensitive EOs (updated: June 2022)

M_RR_TTT_SS	EO_ID	ECODE	S_RANK	SNAME	SCOMNAME	LAST_OBS_D
-------------	-------	-------	--------	-------	----------	------------

No Non-sensitive EOs Found: Next Steps - See FAQ (<https://www.albertaparks.ca/albertaparksca/management-land-use/alberta-conservation-information-management-system-acims/faqs.aspx#2> - Process).

■ Sensitive EOs (updated: June 2022)

M-RR-TTT	EO_ID	ECODE	S_RANK	SNAME	SCOMNAME	LAST_OBS_D
----------	-------	-------	--------	-------	----------	------------

No Sensitive EOs Found: Next Steps - See FAQ (<https://www.albertaparks.ca/albertaparksca/management-land-use/alberta-conservation-information-management-system-acims/faqs.aspx#2> - Process).

Date: 25/1/2023

Requestor: Consultant

Reason for Request: Permitting

SEC: -- **TWP:** 040 **RGE:** 14 **MER:** 4



■ Non-sensitive EOs (updated: June 2022)

M_RR_TTT_SS	EO_ID	ECODE	S_RANK	SNAME	SCOMNAME	LAST_OBS_D
-------------	-------	-------	--------	-------	----------	------------

No Non-sensitive EOs Found: Next Steps - See FAQ (<https://www.albertaparks.ca/albertaparksca/management-land-use/alberta-conservation-information-management-system-acims/faqs.aspx#2> - Process).

■ Sensitive EOs (updated: June 2022)

M-RR-TTT	EO_ID	ECODE	S_RANK	SNAME	SCOMNAME	LAST_OBS_D
----------	-------	-------	--------	-------	----------	------------

No Sensitive EOs Found: Next Steps - See FAQ (<https://www.albertaparks.ca/albertaparksca/management-land-use/alberta-conservation-information-management-system-acims/faqs.aspx#2> - Process).

Date: 25/1/2023

Requestor: Consultant

Reason for Request: Permitting

SEC: -- TWP: 040 RGE: 15 MER: 4



■ Non-sensitive EOs (updated: June 2022)

M_RR_TTT_SS	EO_ID	ECODE	S_RANK	SNAME	SCOMNAME	LAST_OBS_D
-------------	-------	-------	--------	-------	----------	------------

No Non-sensitive EOs Found: Next Steps - See FAQ (<https://www.albertaparks.ca/albertaparksca/management-land-use/alberta-conservation-information-management-system-acims/faqs.aspx#2> - Process).

■ Sensitive EOs (updated: June 2022)

M-RR-TTT	EO_ID	ECODE	S_RANK	SNAME	SCOMNAME	LAST_OBS_D
----------	-------	-------	--------	-------	----------	------------

No Sensitive EOs Found: Next Steps - See FAQ (<https://www.albertaparks.ca/albertaparksca/management-land-use/alberta-conservation-information-management-system-acims/faqs.aspx#2> - Process).

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Authorization Viewer - Search Results

For Water Act approvals, amendments and Code of Practice notifications issued by the Alberta Energy Regulator during or after 2018, please refer to the following link [OneStop Application Query Tool \(aer.ca\)](#).

The Search Used the Following Values:	
Legal Land Location:	33-039-14-W4
Act / Document Type:	Water Act, EPEA
Show Inactive Authorizations:	Yes

The resulting Authorizations based on the search criteria will be displayed below. A  will appear next to the Authorization when documentation is available for viewing or downloading. Please click [Viewer Help](#) if you encounter problems viewing the Authorization document.

3 Result(s)

	Document 00037420-00-00 JACKSON, WR, 12508 is held by Howard Jackson, under the provisions of the <i>Water Resources Act</i>. This Licence is currently issued as of Feb. 18, 1969 and does not expire.
	Document 00134217-00-00 RENAISSANCE HALKIRKE 11-33-39-14 WELL is held by Husky Oil Operations Limited, under the provisions of the <i>Environmental Protection & Enhancement Act</i>. This Reclamation Certificate is currently issued as of Sep. 08, 2000 and does not expire.
	Notice 00352196-00-00 under the provisions of the <i>Water Act</i>, Code of Practice for <i>Watercourse Crossings</i> at SW 35-39-14-W5 * affecting the Wetland - Non Peatlands was received from ALTALINK MANAGEMENT LTD. on Jun. 09, 2014. * Additional locations and water bodies, including the queried location, are associated with this notice.

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The Search Used the Following Values:

Legal Land Location:	NE 02-040-15-W4
Act / Document Type:	Water Act, EPEA
Show Inactive Authorizations:	Yes

The resulting Authorizations based on the search criteria will be displayed below. A  will appear next to the Authorization when documentation is available for viewing or downloading. Please click [Viewer Help](#) if you encounter problems viewing the Authorization document.

1 Result(s)

Document 00182707-00-00 CASTOR/REGISTRATION/LLOYD ERION FAMILY - F00182707 is held by Lloyd Erion, under the provisions of the <i>Water Act</i>. This Registration is currently issued as of Feb. 27, 2006 and does not expire.

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For Water Act approvals, amendments and Code of Practice notifications issued by the Alberta Energy Regulator during or after 2018, please refer to the following link [OneStop Application Query Tool \(aer.ca\)](#).

The Search Used the Following Values:	
Legal Land Location:	NE 04-040-15-W4
Act / Document Type:	Water Act, EPEA
Show Inactive Authorizations:	Yes

The resulting Authorizations based on the search criteria will be displayed below. A  will appear next to the Authorization when documentation is available for viewing or downloading. Please click [Viewer Help](#) if you encounter problems viewing the Authorization document.

0 Result(s)

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For Water Act approvals, amendments and Code of Practice notifications issued by the Alberta Energy Regulator during or after 2018, please refer to the following link [OneStop Application Query Tool \(aer.ca\)](#).

The Search Used the Following Values:	
Legal Land Location:	SE 09-040-15-W4
Act / Document Type:	Water Act, EPEA
Show Inactive Authorizations:	Yes

The resulting Authorizations based on the search criteria will be displayed below. A  will appear next to the Authorization when documentation is available for viewing or downloading. Please click [Viewer Help](#) if you encounter problems viewing the Authorization document.

0 Result(s)

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For Water Act approvals, amendments and Code of Practice notifications issued by the Alberta Energy Regulator during or after 2018, please refer to the following link [OneStop Application Query Tool \(aer.ca\)](#).

The Search Used the Following Values:	
Legal Land Location:	SW 25-039-14-W4
Act / Document Type:	Water Act, EPEA
Show Inactive Authorizations:	Yes

The resulting Authorizations based on the search criteria will be displayed below. A  will appear next to the Authorization when documentation is available for viewing or downloading. Please click [Viewer Help](#) if you encounter problems viewing the Authorization document.

3 Result(s)

Notice 00331790-00-00 under the provisions of the <i>Water Act</i> , Code of Practice for <i>Watercourse Crossings</i> at NW 13-50-16-W4 * affecting the Unnamed Stream - Unclassified was received from ATCO ELECTRIC LTD. on Jun. 13, 2013. * Additional locations and water bodies, including the queried location, are associated with this notice.
Notice 00343417-00-00 under the provisions of the <i>Water Act</i> , Code of Practice for <i>Watercourse Crossings</i> at NE 36-28-14-W4 * affecting the Wetland - Non Peatlands was received from ATCO ELECTRIC LTD. on Dec. 12, 2013. * Additional locations and water bodies, including the queried location, are associated with this notice.
Notice 00353223-00-00 under the provisions of the <i>Water Act</i> , Code of Practice for <i>Watercourse Crossings</i> at SW 4-50-15-W4 * affecting the Albert Lake was received from ATCO ELECTRIC LTD. on Jul. 02, 2014. * Additional locations and water bodies, including the queried location, are associated with this notice.

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The Search Used the Following Values:

Legal Land Location:	SW 34-039-14-W4
Act / Document Type:	Water Act, EPEA
Show Inactive Authorizations:	Yes

The resulting Authorizations based on the search criteria will be displayed below. A  will appear next to the Authorization when documentation is available for viewing or downloading. Please click [Viewer Help](#) if you encounter problems viewing the Authorization document.

1 Result(s)

Document 00182707-00-00 CASTOR/REGISTRATION/LLOYD ERION FAMILY - F00182707 is held by Lloyd Erion, under the provisions of the <i>Water Act</i>. This Registration is currently issued as of Feb. 27, 2006 and does not expire.

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Fish and Wildlife Internet Mapping Tool (FWIMT)

(source database: Fish and Wildlife Management Information System (FWMIS))

Species Summary Report

Report Date: 07-Oct-2022 09:18

Species present within the current extent

Fish Inventory

No Species Found in Search Extent

Wildlife Inventory

AMERICAN KESTREL
 AMERICAN WHITE PELICAN
 BADGER
 BALD EAGLE
 BALTIMORE ORIOLE
 BARN SWALLOW
 BLACK TERN
 BOBOLINK
 EASTERN KINGBIRD
 GOLDEN EAGLE
 GREAT BLUE HERON
 GREAT GRAY OWL
 LITTLE BROWN BAT
 LOGGERHEAD SHRIKE
 RED BAT
 SANDHILL CRANE
 SHORT-EARED OWL
 SILVER-HAIRED BAT
 SORA

Stocked Inventory

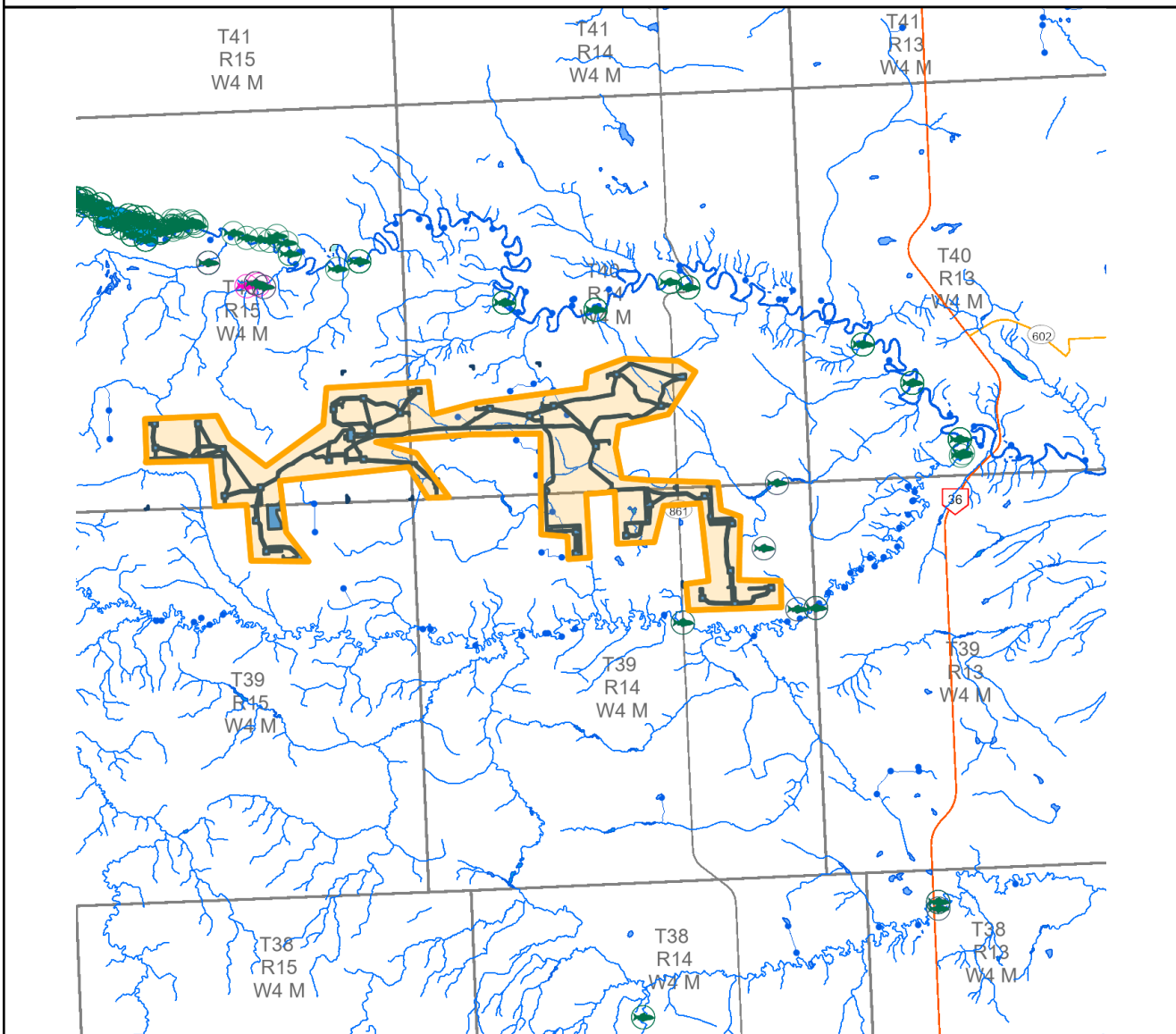
No Species Found in Search Extent

Buffer Extent

Centroid (X,Y)	Projection	Centroid (Qtr Sec Twp Rng Mer)	Radius or Dimensions
703851, 5808265	10-TM AEP Forest	SE 6 40 14 4	15689, 6211 meters

Contact Information

For contact information, please visit:
<https://www.alberta.ca/fisheries-and-wildlife-management-contacts.aspx>



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Landscape Analysis Tool (LAT) Report

Miscellaneous Lease

000005EA25

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LAT Number:	000005EA25	LAT Date:	2022-11-03	09:27:26
Project Name:	Halkirk			
Project Description:				
Disposition Type:	DML	Miscellaneous Lease		
Purpose Type:	PURL	Public Works		
Activity Type:	PURL07DMLP	Other Facility		

Responsibility of Applicants:

It is the applicant's responsibility to conduct a full review of the generated LAT Report, ensuring that you are aware and have a full understanding of the identified standards and conditions, and any additional limitations that may also be imposed by an approved higher level plan, reservation or notation or any other law or Order of the Province or the Government of Canada that may impact the placement, construction or operation of the proposed disposition, purpose and activity.

The applicant must assess if the proposed disposition, purpose and activity can meet the applicable standards, conditions and any limitations which will subsequently determine if the application can be submitted to the regulatory body. Applicants should complete a thorough review of regulatory and application processes including supporting procedural documents and the generated LAT Reports prior to making this determination.

Where the applicant chooses not to meet, or is not able to meet, one or more Approval Standards or higher level plans within the generated LAT Report as submitted as part of the application, or any affected reservations as identified within the land status report, the applicant is required to complete the appropriate mitigation as part of their supplement submission that addresses individually each of the items not being met.

The information provided within the LAT Tool is a spatial representation of features provided to the applicant for activity and land use planning. The accuracy of these layers varies depending on the resource value being represented. The regulatory body insists that site visits, wildlife surveys and groundtruthing efforts are completed to ensure that you, the applicant can meet the procedures detailed within the *Pre-Application Requirements for Formal Dispositions*, the identified approval standards, operating conditions and *Best Management Practices* as represented within the *Master Schedule of Standards and Conditions*.

Proximity to Watercourse/Waterbodies:

Applicants will ensure that standards or conditions for Watercourse/Waterbody features as identified within the generated LAT Report are followed. It is the responsibility of the applicant to ensure the identified setbacks and buffers are properly established through a pre-site assessment and maintained.

NOTE: Be aware that the submission of a LAT Report as part of an application submission does not imply approval of the activity. The standards and conditions identified within the LAT Report may be subject to change based on regulatory review.

Landscape Analysis Tool (LAT) Report

Miscellaneous Lease

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Base Features

Green/White Area	White Area
Municipality	County of Paintearth No. 18
FMA	
FMU	
Provincial Grazing Reserve	
Rocky Mountain Forest Reserve	
PLUZ Areas	
Protected Areas	

Provincial Sanctuaries

Wildlife Corridors	
Restricted Area	
Game Bird	Zone 3
Seasonal	

Landscape Analysis Tool (LAT) Report

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Higher Level Plans

Integrated Resource Plan (Local)	
Integrated Resource Plan (Subregional)	
Access Management Plan	
Landscape Management Plan	

Landscape Analysis Tool (LAT) Report

Miscellaneous Lease

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Additional Application Requirements

Wildlife Survey	Yes	DND Area	
-----------------	-----	----------	--

Historical Resources

HRV Rating	Category
5	p
5	p
5	p
5	p
5	a, p
5	p
5	p

Historic Resources Application Required: No

While no specific historic resource concerns have been identified within the proposed activity area, Section 31 of the *Historical Resources Act* states that "a person who discovers a historic resource in the course of making an excavation for a purpose other than for the purpose of seeking historic resources shall forthwith notify the Minister of the discovery." Should a historic resource be encountered with the construction or operation of this disposition, information on who to contact can be found on the Ministry of Culture and Tourism's website in; Standard Requirements under the Historical Resources Act: Reporting the Discovery of Historic Resources.

Landscape Analysis Tool (LAT) Report

Miscellaneous Lease

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Sensitive Features

Wildlife and Other Sensitive Species

	Intersected		Intersected
Burrowing Owl Range		Key Wildlife and Biodiversity Areas	
Caribou Range		Mountain Goat and Sheep Areas Disease Buffer	
Caribou Range - Zone A		Mountain Goat and Sheep Zone	
Caribou Range - Zone B		Ord's Kangaroo Rat Range	
Colonial Nesting Birds		Ord's Kangaroo Rat Key Habitat Area	
Critical Habitat of Aquatic Species at Risk		Piping Plover Waterbodies	
Endangered and Threatened Plants Ranges		Provincial Hibernacula Buffer	
Greater Short-horned Lizard Habitat		Sensitive Amphibian Ranges	
Greater Short-horned Lizard Range		Sensitive Raptor Range	Yes
Greater Sage Grouse Core Area		Sensitive Snake Habitat	
Greater Sage Grouse Recovery Area		Sensitive Snake Hibernacula Range	
Greater Sage Grouse Leks and Buffer		Sharp-tailed Grouse Leks and Buffer	
Grizzly Bear Core Access Management Area		Sharp-tailed Grouse Survey	Yes
Grizzly Bear Habitat Linkage		Special Access Area	
Grizzly Bear Secondary Access Management Area		Swift Fox Range	
Grizzly Bear Support Zone		Trumpeter Swan Waterbodies/Watercourse	
High Risk Watersheds		Trumpeter Swan Watercourse Buffer	

Federal Orders:

	Intersected
Greater Sage Grouse	

Grassland and Natural Regions:

	Intersected		Intersected
Central Parkland	Yes	Mixed Grass Sub-region layer	
Central Parkland and Northern Fescue		Montane	
Chinook Grasslands		Northern Fescue	
Dry Mixed Grass		Peace River Parkland	
Foothills Fescue		Permafrost	
Foothills Parkland Grasslands		Rough Fescue PNT	
Grassland and Parkland Natural Region	Yes	Subalpine or Alpine	

Landscape Analysis Tool (LAT) Report

Miscellaneous Lease

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Alberta Township System (ATS) Land List

Quarter	Section	Township	Range	Meridian	Road Allow.	Sensitive Features Identified
NW	26	39	14	4	RW	Grassland and Parkland Natural Region,Sensitive Raptor Range,Sharp-tailed Grouse Survey,Central Parkland,Green / White Area
NW	34	39	14	4		Grassland and Parkland Natural Region,Sensitive Raptor Range,Sharp-tailed Grouse Survey,Central Parkland,Green / White Area
SE	34	39	14	4		Grassland and Parkland Natural Region,Sensitive Raptor Range,Sharp-tailed Grouse Survey,Central Parkland,Green / White Area
SE	3	40	14	4		Grassland and Parkland Natural Region,Sensitive Raptor Range,Sharp-tailed Grouse Survey,Central Parkland,Green / White Area
SW	3	40	14	4	RI	Grassland and Parkland Natural Region,Sensitive Raptor Range,Sharp-tailed Grouse Survey,Central Parkland,Green / White Area
NE	8	40	14	4		Grassland and Parkland Natural Region,Sensitive Raptor Range,Sharp-tailed Grouse Survey,Central Parkland,Green / White Area
NW	9	40	14	4	RW	Grassland and Parkland Natural Region,Sensitive Raptor Range,Sharp-tailed Grouse Survey,Central Parkland,Green / White Area
NW	10	40	14	4		Grassland and Parkland Natural Region,Sensitive Raptor Range,Sharp-tailed Grouse Survey,Central Parkland,Green / White Area
SW	17	40	14	4	RI	Grassland and Parkland Natural Region,Sensitive Raptor Range,Sharp-tailed Grouse Survey,Central Parkland,Green / White Area
NE	34	39	15	4		Grassland and Parkland Natural Region,Sensitive Raptor Range,Sharp-tailed Grouse Survey,Central Parkland,Green / White Area
SE	34	39	15	4		Grassland and Parkland Natural Region,Sensitive Raptor Range,Sharp-tailed Grouse Survey,Central Parkland,Green / White Area
NW	36	39	15	4	RW	Grassland and Parkland Natural Region,Sensitive Raptor Range,Sharp-tailed Grouse Survey,Central Parkland,Green / White Area
SE	1	40	15	4		Grassland and Parkland Natural Region,Sensitive Raptor Range,Sharp-tailed Grouse Survey,Central Parkland,Green / White Area
SW	1	40	15	4	RS	Grassland and Parkland Natural Region,Sensitive Raptor Range,Sharp-tailed Grouse Survey,Central Parkland,Green / White Area
SW	2	40	15	4		Grassland and Parkland Natural Region,Sensitive Raptor Range,Sharp-tailed Grouse Survey,Central Parkland,Green / White Area
SW	9	40	15	4	RW	Grassland and Parkland Natural Region,Sensitive Raptor Range,Sharp-tailed Grouse Survey,Central Parkland,Green / White Area

Landscape Analysis Tool (LAT) Report

Miscellaneous Lease

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SE	11	40	15	4		Grassland and Parkland Natural Region,Sensitive Raptor Range,Sharp-tailed Grouse Survey,Central Parkland,Green / White Area
SW	1	40	15	4	RI	Grassland and Parkland Natural Region,Sensitive Raptor Range,Sharp-tailed Grouse Survey,Central Parkland,Green / White Area
NW	3	40	15	4	RW	Grassland and Parkland Natural Region,Sensitive Raptor Range,Sharp-tailed Grouse Survey,Central Parkland,Green / White Area
SW	6	40	14	4	RW	Grassland and Parkland Natural Region,Sensitive Raptor Range,Sharp-tailed Grouse Survey,Central Parkland,Green / White Area
SW	25	39	14	4	RW	Grassland and Parkland Natural Region,Sensitive Raptor Range,Sharp-tailed Grouse Survey,Central Parkland,Green / White Area
SW	26	39	14	4	RW	Grassland and Parkland Natural Region,Sensitive Raptor Range,Sharp-tailed Grouse Survey,Central Parkland,Green / White Area
SW	33	39	14	4	RW	Grassland and Parkland Natural Region,Sensitive Raptor Range,Sharp-tailed Grouse Survey,Central Parkland,Green / White Area
SE	2	40	14	4	RS	Grassland and Parkland Natural Region,Sensitive Raptor Range,Sharp-tailed Grouse Survey,Central Parkland,Green / White Area
NW	6	40	14	4	RW	Grassland and Parkland Natural Region,Sensitive Raptor Range,Sharp-tailed Grouse Survey,Central Parkland,Green / White Area
SW	7	40	14	4	RW	Grassland and Parkland Natural Region,Sensitive Raptor Range,Sharp-tailed Grouse Survey,Central Parkland,Green / White Area
SW	12	40	15	4	RW	Grassland and Parkland Natural Region,Sensitive Raptor Range,Sharp-tailed Grouse Survey,Central Parkland,Green / White Area
NW	8	40	14	4	RW	Grassland and Parkland Natural Region,Sensitive Raptor Range,Sharp-tailed Grouse Survey,Central Parkland,Green / White Area
NE	3	40	15	4		Grassland and Parkland Natural Region,Sensitive Raptor Range,Sharp-tailed Grouse Survey,Central Parkland,Green / White Area
SE	3	40	15	4		Grassland and Parkland Natural Region,Sensitive Raptor Range,Sharp-tailed Grouse Survey,Central Parkland,Green / White Area
SW	35	39	14	4		Grassland and Parkland Natural Region,Sensitive Raptor Range,Sharp-tailed Grouse Survey,Central Parkland,Green / White Area
SE	8	40	14	4		Grassland and Parkland Natural Region,Sensitive Raptor Range,Sharp-tailed Grouse Survey,Central Parkland,Green / White Area
NW	1	40	15	4		Grassland and Parkland Natural Region,Sensitive Raptor Range,Sharp-tailed Grouse Survey,Central Parkland,Green / White Area
SW	6	40	14	4	RI	Grassland and Parkland Natural Region,Sensitive Raptor Range,Sharp-tailed Grouse Survey,Central Parkland,Green / White Area

Landscape Analysis Tool (LAT) Report

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NW	2	40	15	4	RW	Grassland and Parkland Natural Region,Sensitive Raptor Range,Sharp-tailed Grouse Survey,Central Parkland,Green / White Area
SE	26	39	14	4		Grassland and Parkland Natural Region,Sensitive Raptor Range,Sharp-tailed Grouse Survey,Central Parkland,Green / White Area
SE	33	39	14	4		Grassland and Parkland Natural Region,Sensitive Raptor Range,Sharp-tailed Grouse Survey,Central Parkland,Green / White Area
SW	4	40	14	4	RI	Grassland and Parkland Natural Region,Sensitive Raptor Range,Sharp-tailed Grouse Survey,Central Parkland,Green / White Area
NW	26	39	14	4		Grassland and Parkland Natural Region,Sensitive Raptor Range,Sharp-tailed Grouse Survey,Central Parkland,Green / White Area
SW	1	40	15	4	RW	Grassland and Parkland Natural Region,Sensitive Raptor Range,Sharp-tailed Grouse Survey,Central Parkland,Green / White Area
NW	3	40	15	4		Grassland and Parkland Natural Region,Sensitive Raptor Range,Sharp-tailed Grouse Survey,Central Parkland,Green / White Area
SE	5	40	15	4		Grassland and Parkland Natural Region,Sensitive Raptor Range,Sharp-tailed Grouse Survey,Central Parkland,Green / White Area
NW	35	39	14	4	RW	Grassland and Parkland Natural Region,Sensitive Raptor Range,Sharp-tailed Grouse Survey,Central Parkland,Green / White Area
NE	1	40	15	4		Grassland and Parkland Natural Region,Sensitive Raptor Range,Sharp-tailed Grouse Survey,Central Parkland,Green / White Area
NE	2	40	15	4		Grassland and Parkland Natural Region,Sensitive Raptor Range,Sharp-tailed Grouse Survey,Central Parkland,Green / White Area
SW	9	40	14	4	RW	Grassland and Parkland Natural Region,Sensitive Raptor Range,Sharp-tailed Grouse Survey,Central Parkland,Green / White Area
NW	12	40	15	4		Grassland and Parkland Natural Region,Sensitive Raptor Range,Sharp-tailed Grouse Survey,Central Parkland,Green / White Area
SW	34	39	14	4		Grassland and Parkland Natural Region,Sensitive Raptor Range,Sharp-tailed Grouse Survey,Central Parkland,Green / White Area
SW	3	40	14	4		Grassland and Parkland Natural Region,Sensitive Raptor Range,Sharp-tailed Grouse Survey,Central Parkland,Green / White Area
NE	7	40	14	4		Grassland and Parkland Natural Region,Sensitive Raptor Range,Sharp-tailed Grouse Survey,Central Parkland,Green / White Area
SW	8	40	14	4		Grassland and Parkland Natural Region,Sensitive Raptor Range,Sharp-tailed Grouse Survey,Central Parkland,Green / White Area
NW	11	40	14	4		Grassland and Parkland Natural Region,Sensitive Raptor Range,Sharp-tailed Grouse Survey,Central Parkland,Green / White Area

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SW	3	40	15	4		Grassland and Parkland Natural Region,Sensitive Raptor Range,Sharp-tailed Grouse Survey,Central Parkland,Green / White Area
NW	4	40	14	4		Grassland and Parkland Natural Region,Sensitive Raptor Range,Sharp-tailed Grouse Survey,Central Parkland,Green / White Area
SE	4	40	14	4		Grassland and Parkland Natural Region,Sensitive Raptor Range,Sharp-tailed Grouse Survey,Central Parkland,Green / White Area
SW	2	40	15	4	RW	Grassland and Parkland Natural Region,Sensitive Raptor Range,Sharp-tailed Grouse Survey,Central Parkland,Green / White Area
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NW	4	40	15	4		Grassland and Parkland Natural Region,Sensitive Raptor Range,Sharp-tailed Grouse Survey,Central Parkland,Green / White Area
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SE	35	39	14	4		Grassland and Parkland Natural Region,Sensitive Raptor Range,Sharp-tailed Grouse Survey,Central Parkland,Green / White Area
NW	4	40	15	4	RW	Grassland and Parkland Natural Region,Sensitive Raptor Range,Sharp-tailed Grouse Survey,Central Parkland,Green / White Area
NE	11	40	15	4		Grassland and Parkland Natural Region,Sensitive Raptor Range,Sharp-tailed Grouse Survey,Central Parkland,Green / White Area
SW	26	39	14	4		Grassland and Parkland Natural Region,Sensitive Raptor Range,Sharp-tailed Grouse Survey,Central Parkland,Green / White Area
NW	33	39	14	4	RW	Grassland and Parkland Natural Region,Sensitive Raptor Range,Sharp-tailed Grouse Survey,Central Parkland,Green / White Area
SW	33	39	14	4		Grassland and Parkland Natural Region,Sensitive Raptor Range,Sharp-tailed Grouse Survey,Central Parkland,Green / White Area
SW	9	40	14	4		Grassland and Parkland Natural Region,Sensitive Raptor Range,Sharp-tailed Grouse Survey,Central Parkland,Green / White Area
NE	10	40	14	4		Grassland and Parkland Natural Region,Sensitive Raptor Range,Sharp-tailed Grouse Survey,Central Parkland,Green / White Area
SW	10	40	14	4	RW	Grassland and Parkland Natural Region,Sensitive Raptor Range,Sharp-tailed Grouse Survey,Central Parkland,Green / White Area
SW	2	40	14	4	RS	Grassland and Parkland Natural Region,Sensitive Raptor Range,Sharp-tailed Grouse Survey,Central Parkland,Green / White Area
SE	4	40	14	4	RS	Grassland and Parkland Natural Region,Sensitive Raptor Range,Sharp-tailed Grouse Survey,Central Parkland,Green / White Area
SW	4	40	14	4	RW	Grassland and Parkland Natural Region,Sensitive Raptor Range,Sharp-tailed Grouse Survey,Central Parkland,Green / White Area
NW	1	40	15	4	RW	Grassland and Parkland Natural Region,Sensitive Raptor Range,Sharp-tailed Grouse Survey,Central Parkland,Green / White Area
SE	5	40	15	4	RS	Grassland and Parkland Natural Region,Sensitive Raptor Range,Sharp-tailed Grouse Survey,Central Parkland,Green / White Area
SW	6	40	14	4		Grassland and Parkland Natural Region,Sensitive Raptor Range,Sharp-tailed Grouse Survey,Central Parkland,Green / White Area
SE	1	40	15	4	RS	Grassland and Parkland Natural Region,Sensitive Raptor Range,Sharp-tailed Grouse Survey,Central Parkland,Green / White Area
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SE	9	40	15	4		Grassland and Parkland Natural Region,Sensitive Raptor Range,Sharp-tailed Grouse Survey,Central Parkland,Green / White Area

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SW	3	40	14	4	RW	Grassland and Parkland Natural Region,Sensitive Raptor Range,Sharp-tailed Grouse Survey,Central Parkland,Green / White Area
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SE	18	40	14	4	RS	Grassland and Parkland Natural Region,Sensitive Raptor Range,Sharp-tailed Grouse Survey,Central Parkland,Green / White Area
NW	3	40	14	4	RW	Grassland and Parkland Natural Region,Sensitive Raptor Range,Sharp-tailed Grouse Survey,Central Parkland,Green / White Area
SW	3	40	14	4	RS	Grassland and Parkland Natural Region,Sensitive Raptor Range,Sharp-tailed Grouse Survey,Central Parkland,Green / White Area
SE	9	40	14	4		Grassland and Parkland Natural Region,Sensitive Raptor Range,Sharp-tailed Grouse Survey,Central Parkland,Green / White Area
SW	11	40	14	4	RW	Grassland and Parkland Natural Region,Sensitive Raptor Range,Sharp-tailed Grouse Survey,Central Parkland,Green / White Area
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SW	4	40	15	4	RW	Grassland and Parkland Natural Region,Sensitive Raptor Range,Sharp-tailed Grouse Survey,Central Parkland,Green / White Area
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NW	7	40	14	4	RW	Grassland and Parkland Natural Region,Sensitive Raptor Range,Sharp-tailed Grouse Survey,Central Parkland,Green / White Area
SE	7	40	14	4		Grassland and Parkland Natural Region,Sensitive Raptor Range,Sharp-tailed Grouse Survey,Central Parkland,Green / White Area
SW	8	40	14	4	RW	Grassland and Parkland Natural Region,Sensitive Raptor Range,Sharp-tailed Grouse Survey,Central Parkland,Green / White Area
SW	4	40	15	4	RI	Grassland and Parkland Natural Region,Sensitive Raptor Range,Sharp-tailed Grouse Survey,Central Parkland,Green / White Area
SW	9	40	15	4		Grassland and Parkland Natural Region,Sensitive Raptor Range,Sharp-tailed Grouse Survey,Central Parkland,Green / White Area
SE	12	40	15	4		Grassland and Parkland Natural Region,Sensitive Raptor Range,Sharp-tailed Grouse Survey,Central Parkland,Green / White Area
NW	35	39	15	4	RW	Grassland and Parkland Natural Region,Sensitive Raptor Range,Sharp-tailed Grouse Survey,Central Parkland,Green / White Area

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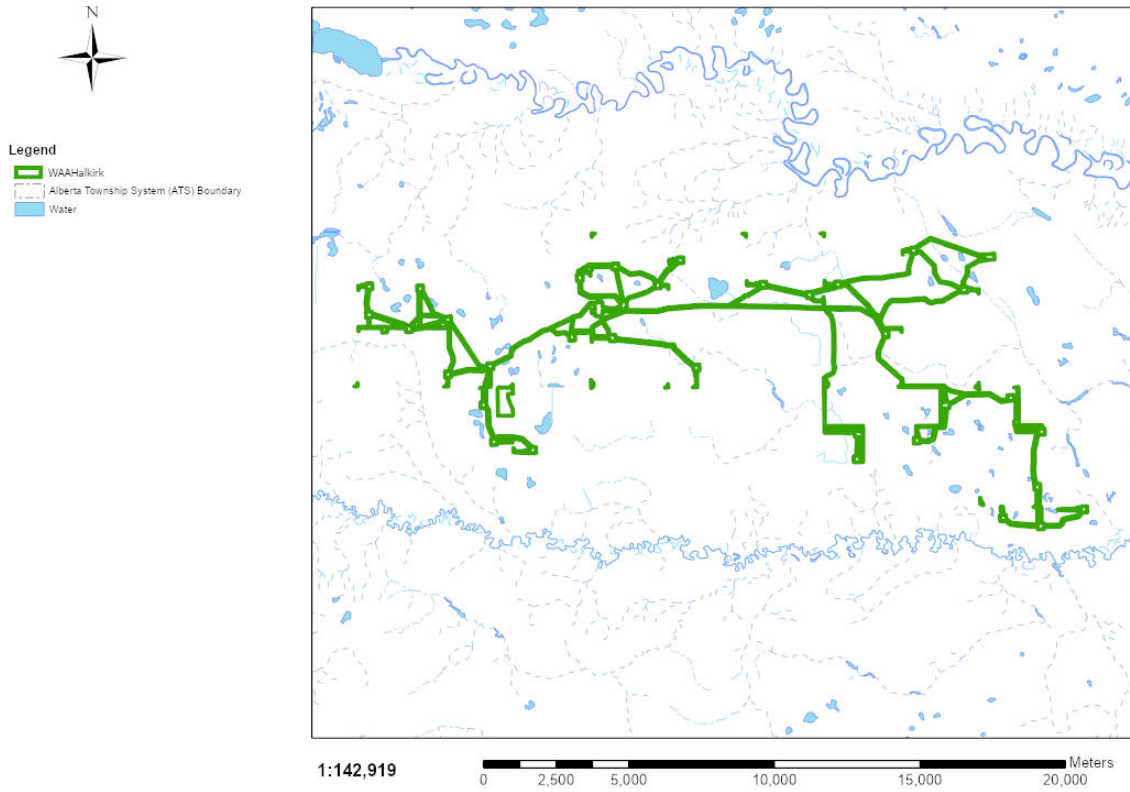
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SW	4	40	14	4		Grassland and Parkland Natural Region,Sensitive Raptor Range,Sharp-tailed Grouse Survey,Central Parkland,Green / White Area
NE	4	40	15	4		Grassland and Parkland Natural Region,Sensitive Raptor Range,Sharp-tailed Grouse Survey,Central Parkland,Green / White Area
SW	10	40	14	4		Grassland and Parkland Natural Region,Sensitive Raptor Range,Sharp-tailed Grouse Survey,Central Parkland,Green / White Area
SE	3	40	15	4	RS	Grassland and Parkland Natural Region,Sensitive Raptor Range,Sharp-tailed Grouse Survey,Central Parkland,Green / White Area
NE	26	39	14	4		Grassland and Parkland Natural Region,Sensitive Raptor Range,Sharp-tailed Grouse Survey,Central Parkland,Green / White Area
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SW	4	40	14	4	RS	Grassland and Parkland Natural Region,Sensitive Raptor Range,Sharp-tailed Grouse Survey,Central Parkland,Green / White Area
NW	6	40	14	4		Grassland and Parkland Natural Region,Sensitive Raptor Range,Sharp-tailed Grouse Survey,Central Parkland,Green / White Area
NW	7	40	14	4		Grassland and Parkland Natural Region,Sensitive Raptor Range,Sharp-tailed Grouse Survey,Central Parkland,Green / White Area
SE	10	40	14	4		Grassland and Parkland Natural Region,Sensitive Raptor Range,Sharp-tailed Grouse Survey,Central Parkland,Green / White Area
NW	11	40	14	4	RW	Grassland and Parkland Natural Region,Sensitive Raptor Range,Sharp-tailed Grouse Survey,Central Parkland,Green / White Area

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Land Management

Report ID	Approval	Condition
1	1030-AS	Where an Integrated Resource Plan or a Reservation/Protective Notation identifies a greater set back, the greater set back will prevail.
2	1031-AS	Where a Higher Level Plan* exists, the Disposition Holder must follow any direction provided within that plan.
3	1033-AS	With the exception of pipelines, for activities that fall within any Protective Notation (PNT) lands with a purpose code 400 Series encompassing a section of land (259 hectares) or less, located in the Provincial White Area, the Disposition Holder must construct all activities within lands previously disturbed or cleared. Where no previous disturbance exists, activities must occur within 100 metres of the PNT.
4	1041	The Disposition Holder must maintain proper drainage of surface water.
5	1044-AS	The Disposition Holder must not locate activities within 45 metres from the top of any coulees* with the exception of activities such as; access, pipelines and linear easements crossing those features.
6	1049	The Disposition Holder must remove all garbage and waste material from this site.
7	1053	The Disposition Holder must not enter the boundaries of any research or sample plot unless consent is received from the reservation holder.
8	1061	Where FireSmart activities are considered, the Disposition Holder must follow Information Letter- "Authorization of FireSmart Activities on Public Land" as amended from time to time.

Vegetation

Report ID	Approval	Condition
9	1300	The disposition holder must manage all regulated weeds to the satisfaction of the regulatory body.
10	1302	"The Disposition Holder must remove all deciduous or coniferous merchantable timber from the Activity as per the following utilization standards; <ul style="list-style-type: none"> - Deciduous Timber: 15 cm Base/10 cm Top - Coniferous Timber: 15 cm Base/11cm Top and haul said timber to the location of end use."
11	1304	For fire control purposes on forested lands, the Disposition Holder must dispose of excess coarse woody debris* not utilized for rollback* or stockpiled for reclamation*.
12	1305	Within FireSmart Community Zones*, the Disposition Holder must dispose of coarse woody debris* by burning unless a Debris Management Plan has been approved under the Forest and Prairie Protection Act.

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Soil		
Report ID	Approval	Condition
13	1356	The Disposition Holder must not conduct the Activity during adverse ground conditions*.
14	1357	The Disposition Holder must prevent erosion* and sedimentation on to adjacent* Lands or Water bodies * that results from the activity.
15	1359-AS	The Disposition Holder must not remove from the Lands topsoil* or subsoil* unless approved in writing by the Regulatory Body.
16	1360	"Where activities have occurred on the Lands that do not involve minimal disturbance* construction, the Disposition Holder must salvage topsoil* for land reclamation as follows: a. Salvage all topsoil* from: i. Mineral soils ii. Shallow organic soils* iii. Reclaimed soils b. Where the depth of the topsoil* is less than 15 cm, the topsoil* and part of the subsoil* to a total depth of 15 centimetres must be salvaged, unless the upper subsoil* is considered chemically unsuitable*."
17	1363	All reclamation material* must be considered suitable as defined in the May 2001 Salt Contamination Assessment Guidelines and meet the February 2016 Alberta Tier 1 Soil and Groundwater Remediation Guidelines, as amended or replaced from time to time.
18	1365	"The Disposition Holder must store reclamation material* in accordance with all of the following: a. reclamation material* must not be placed beneath the ground surface or buried in any way; b. coarse woody debris* stored for reclamation purposes for greater than 12 months must be mixed with topsoil*; and c. topsoil* and subsoil* must be stored separately."
19	1367	The Disposition Holder must not mix wood chips with any reclamation material*.
20	1368	The Disposition Holder must not apply wood chips to the lands at a depth greater than five (5) centimeters.
21	1369	The Disposition Holder must manage wood chips in accordance with the directive ID 2009-01 Management of Wood Chips on Public Land as amended from time to time.
22	1370	The Disposition Holder must not store piles or windrows of reclamation material* within standing timber.
23	1371	The Disposition Holder must not use soil sterilant on the Lands.

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Watercourse / Waterbody		
Report ID	Approval	Condition
24	1402-AS	The Disposition Holder must not conduct the Activity within the following watercourse* setbacks from the top of the breaks: a. Intermittent watercourses* including springs must have a setback of at least 45 metres. b. Small Permanent watercourses* must have a setback of at least 45 metres. c. Large Permanent watercourses* must have a setback of at least 100 metres.
25	1412	The Disposition Holder must acquire an authorization for access (off-disposition) for water withdrawal activities.
26	1419	For use of equipment within the bed of a water body*, the Disposition Holder must prior to operations follow the "Decontamination Protocol for Work in or Near Water", as amended from time to time.
27	1420	The Disposition Holder must provide a completed Record of Decontamination form as proof of decontamination to the Regulatory Body upon request.
Reclamation		
Report ID	Approval	Condition
28	1451	For progressive reclamation* on forested lands*, the Disposition Holder must replace all reclamation materials* that have been salvaged in accordance with all of the following: a. all salvaged subsoil* must be replaced, then all salvaged topsoil*; and b. reclamation materials* must be replaced over the entire progressive reclamation area*; unless otherwise approved in writing by the Regulatory Body.
29	1453	The Disposition Holder must complete temporary reclamation* on the Lands within 1 growing season of construction phase* for all topsoil* and subsoil* stockpiles required for final reclamation*.
30	1454	The Disposition Holder must prior to seeding herbaceous seed in forested* or peatlands* submit a Request for Seeding in writing to the Regulatory Body that contains all of the following: a. rationale for conducting seeding of herbaceous species*; b. a description of the proposed site for seeding including information with respect to the following: i. whether the Lands are subject to high erosion* and; ii. whether the Lands are prone to invasion from agronomic or weed species. c. a proposed seed mix composition for re-vegetation of the Lands in accordance with the Native Plant Revegetation Guidelines for Alberta, 2001 as amended or replaced from time to time or a rationale for alternate species; d. provide a seed certificate in accordance with the Seed Act for the seed mixed mix to be used for re-vegetation* and; any other information requested by the Regulatory Body.

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31	1455	The Disposition Holder must only conduct seeding in accordance with the written authorization of the Regulatory Body.
32	1456	The Disposition Holder must when seeding cultivated lands*; a. use agronomic or forage seed that meets or exceeds Certified #1 as outlined in the Seeds Act and Seeds Regulations; b. use seed mixes that are free of species listed in the Weed Control Act and; c. provide a seed certificate to the Regulatory Body within 30 days of request.
33	1457	Within the Green Area* of the Province, the Disposition Holder must re-vegetate the Lands with trees or shrubs that meet the requirements of the December 2016 Alberta Forest Genetic Resource Management and Conservation Standards document, as amended or replaced from time to time.
34	1459	The Disposition Holder must not have slash and rollback* accumulations within five (5) metres of the perimeter of the disposition boundary, greater than the percent ground cover on the surrounding undisturbed forest floor.
35	1461	The Disposition Holder must complete progressive reclamation* on forested lands* for all associated and incidental disturbances to the Disposition.
36	1462	The following activities are excluded from progressive reclamation* requirement on forested lands*: a) Lands that have received authorization for clay pad construction; and b) Lands with a 4:1 or steeper slopes where a cut and fill has been constructed to level the ground surface.
37	1463	For final reclamation*, the Disposition Holder must complete all of the following: a. contour the disturbed land to the pre-disturbance landform or to the landform approved by the Regulatory body; b. replace all stockpiled subsoil*, then replace all stockpiled topsoil*; c. spread all coarse woody debris* on forested lands* and; d. reclamation materials* must be replaced over the entire area from which they were removed unless otherwise approved in writing by the Regulatory Body.
38	1464	The Disposition Holder must reclaim the Lands to the pre-disturbance land use type* unless otherwise authorized in writing by the Regulatory Body.

Wildlife

Report ID	Approval	Condition
39	1600	The Disposition Holder must conduct a complete and immediate Wildlife Sweep* of the Lands subject to the disposition prior to any activity, as per the "Wildlife Sweep Protocol".
40	1601	The Disposition Holder must submit observations from a Wildlife Sweep* to the Fisheries and Wildlife Management Information System (FWMIS) and notify the issuing Regulatory Body in writing upon request that the Wildlife Sweep* was completed.

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41	1602-AS	The Disposition Holder must incorporate a buffer* zone of a minimum width of 100m undisturbed vegetation, where an established buffer* does not already exist for any and all key habitat features including, but not limited to leks*, nests, dens and houses identified in the Wildlife Sweep*.
42	1603	When Wildlife Surveys* are required, the Disposition Holder must submit results as defined by the sensitive species inventory guidelines from Wildlife Survey* to the Fisheries and Wildlife Management Information System (FWMIS).
43	1608	The Disposition Holder must incorporate buffers*, setbacks and activity timing restrictions for any and all key habitat features including, but not limited to leks*, nests, dens and houses identified in the wildlife survey*.
44	1611-AS	The Disposition Holder must conduct appropriate pre-construction wildlife* surveys as per the direction of the Sensitive Species Inventory Guidelines as amended from time to time where you intersect any of the following sensitive species; <ul style="list-style-type: none"> - Sensitive Raptor Range - Burrowing Owl Range - Sensitive Snake Hibernacula Range - Sharp-tailed Grouse Survey - Swift Fox Range - Ords Kangaroo Rat Range - Piping Plover Waterbodies - Endangered and Threatened Plant Ranges - Grassland and Parkland Natural Regions (Grassland Bird Surveys)

Sensitive Raptor Range

Report ID	Approval	Condition
45	1650-AS	The Disposition Holder must not conduct any activities within 1000 metres of a sensitive raptor active nest*.

Sharp-Tailed Grouse Survey / Leks and Buffers

Report ID	Approval	Condition
46	1740-AS	The Disposition Holder must not conduct any activities* within 500 metres of the perimeter of any known or identified active sharp-tailed grouse lek* sites.

Other Sensitive and Endangered Species

Report ID	Approval	Condition
47	1880-AS	Between April 15 and August 15, the Disposition Holder must not conduct any activities* within 100 metres of an active nest site for Federally listed species.

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Grassland and Parkland Natural Region		
Report ID	Approval	Condition
48	2054	<p>On native grasslands*, the Disposition Holder must not crimp straw* subject to the following exceptions:</p> <ul style="list-style-type: none"> a) The straw* used for crimping must be sourced from a native species* from the same ecological range site* as the Lands; b) The weed analysis for the straw* used for crimping must comply with the Weed Control Act, as amended or replaced from time to time.
49	2062	<p>For activities that fall within native grasslands* as identified by the Central Parkland Subregion that requires Assisted Natural Recovery*, the Disposition Holder must submit a request for Assisted Natural Recovery in writing to the Regulatory Body that contains all of the following:</p> <ol style="list-style-type: none"> 1. Rationale for conducting Assisted Natural Recovery*; 2. A description of the proposed site for Assisted Natural Recovery* including information with respect to the following: <ul style="list-style-type: none"> a. whether the Lands are subject to high erosion; b. whether the soil on the Lands has been disturbed to an area greater than 50m²; c. whether the Lands are prone to invasion from agronomic or weed species; 3. A proposed seed mix composition for re-vegetation of the Lands: <ul style="list-style-type: none"> a. that is consistent with native plant communities that are adjacent to and in the immediate vicinity of the Lands as determined by the A Preliminary Classification of Plant Communities in the Central Parkland Natural Subregion of Alberta, as amended or replaced from time to time; b. provide a seed certificate in accordance with the Seed Act for the seed mix to be used for Assisted Natural Recovery* and; c. any other information requested by the Regulatory Body.
50	2068	<p>The Disposition Holder must not construct activities on native grassland* within the Grassland and Parkland Natural Region between April 15th and August 15th, unless grassland bird surveys are completed as per the Sensitive Species Inventory Guidelines Protocol as amended.</p>
51	2069	<p>The Disposition Holder must not conduct any activities within 100 metres of an active nest site between April 15th and August 15th for the following species:</p> <ul style="list-style-type: none"> • short-eared owl • mountain plover • long-billed curlew • upland sandpiper • Sprague's pipit • Chestnut-collared longspur • Loggerhead Shrike • Bank Swallow

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52	2070-AS	On native grasslands* identified in the Central Parkland and Northern Fescue layer, the Disposition Holder must conduct a conservation assessment as outlined in Conservation Assessments in Native Grassland Strategic Siting and Pre-disturbance Site Assessment Methodology for Industrial Disturbances as amended or replaced from time to time. Upon request by the Regulatory Body, the Disposition Holder must submit the conservation assessment report in writing to the Regulatory Body within 30 days of the request.
53	2071-AS	The Disposition Holder must not conduct activities on loamy soils* in the Central Parkland and Northern Fescue layer as confirmed by the Disposition Holder through the required Conservation Assessment, subject to the following exceptions; a) using existing disturbances* for activities; and b) locating activities adjacent* to existing occupied dispositions and non-native vegetation areas.

APPENDIX E

**Alberta Wetland Rapid Evaluation
Tool Results**

Function (ABWRET-A Raw Score)	W0082	W0098	W0113	W0810	W1287	W2045	W2075	W2111	W2142
Surface Water Storage (WS)	5.97	5.87	5.68	5.69	5.73	6.07	5.84	2.58	5.58
Stream Flow Support (SFS)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.24	0.00
Streamwater Cooling (WC)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.58	0.00
Sediment & Toxicant Retention & Stabilization (SR)	10.00	10.00	10.00	10.00	10.00	10.00	10.00	2.73	10.00
Phosphorus Retention (PR)	10.00	10.00	10.00	10.00	10.00	10.00	10.00	2.60	10.00
Nitrate Removal & Retention (NR)	10.00	10.00	10.00	10.00	10.00	10.00	10.00	3.89	10.00
Organic Nutrient Export (OE)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.10	0.00
Fish Habitat (FH)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Aquatic Invertebrate Habitat (INV)	4.52	4.21	4.62	5.27	4.74	1.35	4.41	4.58	4.79
Amphibian Habitat (AM)	2.36	2.08	2.44	3.42	2.50	0.71	2.42	2.21	2.54
Waterbird Habitat (WB)	3.69	3.85	4.14	4.52	4.60	2.55	4.09	4.28	4.68
Songbird, Raptor, & Mammal Habitat (SBM)	2.56	2.78	2.67	3.07	3.19	3.26	2.64	3.54	3.34
Pollinator & Native Plant Habitat (PH)	2.70	2.13	2.92	3.20	3.47	2.48	2.89	3.88	3.37
Human Use & Recognition (HU)	1.25	1.46	0.95	1.08	0.99	1.39	1.16	1.02	1.01
Function (ABWRET-A Normalized Score)	W0082	W0098	W0113	W0810	W1287	W2045	W2075	W2111	W2142
Surface Water Storage (WS)	0.81	0.80	0.76	0.77	0.77	0.83	0.79	0.22	0.75
Stream Flow Support (SFS)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.69	0.00
Streamwater Cooling (WC)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.81	0.00
Sediment & Toxicant Retention & Stabilization (SR)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.06	1.00
Phosphorus Retention (PR)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.10	1.00
Nitrate Removal & Retention (NR)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.05	1.00
Organic Nutrient Export (OE)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.79	0.00
Fish Habitat (FH)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Aquatic Invertebrate Habitat (INV)	0.43	0.39	0.45	0.53	0.46	0.02	0.42	0.44	0.47
Amphibian Habitat (AM)	0.29	0.24	0.30	0.46	0.31	0.02	0.30	0.26	0.32
Waterbird Habitat (WB)	0.22	0.24	0.27	0.32	0.33	0.08	0.27	0.29	0.34
Songbird, Raptor, & Mammal Habitat (SBM)	0.18	0.22	0.20	0.28	0.30	0.31	0.20	0.37	0.33
Pollinator & Native Plant Habitat (PH)	0.17	0.07	0.21	0.26	0.31	0.13	0.20	0.38	0.29
Human Use & Recognition (HU)	0.04	0.08	0.00	0.01	0.00	0.07	0.02	0.00	0.00
Normalized Score (ABWRET_A) Based on Wetlands in RWVAU	W0082	W0098	W0113	W0810	W1287	W2045	W2075	W2111	W2142
Normalized Hydrological Health (HH)	0.81	0.80	0.76	0.77	0.77	0.83	0.79	0.69	0.75
Normalized Water Quality (WQ)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.81	1.00
Normalized Ecological Health (EH)	0.43	0.39	0.45	0.53	0.46	0.31	0.42	0.44	0.47
Normalized Human Use (HU)	0.04	0.08	0.00	0.01	0.00	0.07	0.02	0.00	0.00
RWVAU #	16	16	16	16	16	16	16	16	16
Normalized Value Score (ABWRET a)	0.68	0.66	0.66	0.69	0.67	0.65	0.67	0.58	0.66
Value Category (a, b, c, d)	d	d	d	d	d	d	d	d	d
Abundance Factor	0	0	0	0	0	0	0	0	0
Final Score(A, B, C, D)	D	D	D	D	D	D	D	D	D

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Classification: Protected A

Function (ABWRET-A Raw Score)	W2151	W1362a	W2245	W2273	W2276	W2283	W2307	W2322	W2343
Surface Water Storage (WS)	6.04	5.87	5.81	3.68	3.04	3.09	3.37	6.54	5.97
Stream Flow Support (SFS)	0.00	0.00	0.00	3.06	3.20	3.20	3.20	0.00	0.00
Streamwater Cooling (WC)	0.00	0.00	0.00	2.15	2.53	2.40	2.28	0.00	0.00
Sediment & Toxicant Retention & Stabilization (SR)	10.00	10.00	10.00	3.74	2.79	2.83	2.89	10.00	10.00
Phosphorus Retention (PR)	10.00	10.00	10.00	3.80	3.22	3.24	3.10	10.00	10.00
Nitrate Removal & Retention (NR)	10.00	10.00	10.00	4.40	4.31	4.59	4.58	10.00	10.00
Organic Nutrient Export (OE)	0.00	0.00	0.00	3.18	3.50	3.42	3.60	0.00	0.00
Fish Habitat (FH)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Aquatic Invertebrate Habitat (INV)	5.00	4.54	4.65	4.59	4.62	4.66	4.63	4.95	4.78
Amphibian Habitat (AM)	2.58	2.39	2.39	2.45	2.28	2.31	2.31	2.56	2.50
Waterbird Habitat (WB)	4.72	4.01	4.28	4.00	3.99	4.01	4.04	4.62	4.84
Songbird, Raptor, & Mammal Habitat (SBM)	3.20	2.50	2.66	2.90	2.73	2.66	2.56	3.16	3.02
Pollinator & Native Plant Habitat (PH)	2.89	2.71	2.01	2.04	2.13	2.11	2.33	3.16	2.54
Human Use & Recognition (HU)	1.34	1.15	1.54	0.99	1.01	1.24	1.01	1.79	1.79
Function (ABWRET-A Normalized Score)	W2151	W1362a	W2245	W2273	W2276	W2283	W2307	W2322	W2343
Surface Water Storage (WS)	0.83	0.80	0.79	0.41	0.30	0.31	0.36	0.91	0.82
Stream Flow Support (SFS)	0.00	0.00	0.00	0.50	0.52	0.52	0.52	0.00	0.00
Streamwater Cooling (WC)	0.00	0.00	0.00	0.31	0.37	0.35	0.33	0.00	0.00
Sediment & Toxicant Retention & Stabilization (SR)	1.00	1.00	1.00	0.19	0.07	0.08	0.08	1.00	1.00
Phosphorus Retention (PR)	1.00	1.00	1.00	0.25	0.18	0.18	0.17	1.00	1.00
Nitrate Removal & Retention (NR)	1.00	1.00	1.00	0.13	0.12	0.16	0.16	1.00	1.00
Organic Nutrient Export (OE)	0.00	0.00	0.00	0.49	0.54	0.53	0.55	0.00	0.00
Fish Habitat (FH)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Aquatic Invertebrate Habitat (INV)	0.50	0.44	0.45	0.44	0.45	0.45	0.45	0.49	0.47
Amphibian Habitat (AM)	0.33	0.29	0.29	0.30	0.28	0.28	0.28	0.32	0.31
Waterbird Habitat (WB)	0.35	0.26	0.29	0.26	0.26	0.26	0.26	0.33	0.36
Songbird, Raptor, & Mammal Habitat (SBM)	0.30	0.17	0.20	0.25	0.22	0.20	0.18	0.29	0.27
Pollinator & Native Plant Habitat (PH)	0.20	0.17	0.05	0.05	0.07	0.07	0.11	0.25	0.14
Human Use & Recognition (HU)	0.06	0.02	0.10	0.00	0.00	0.04	0.00	0.15	0.15
Normalized Score (ABWRET_A) Based on Wetlands in RWVAU	W2151	W1362a	W2245	W2273	W2276	W2283	W2307	W2322	W2343
Normalized Hydrological Health (HH)	0.83	0.80	0.79	0.50	0.52	0.52	0.52	0.91	0.82
Normalized Water Quality (WQ)	1.00	1.00	1.00	0.49	0.54	0.53	0.55	1.00	1.00
Normalized Ecological Health (EH)	0.50	0.44	0.45	0.44	0.45	0.45	0.45	0.49	0.47
Normalized Human Use (HU)	0.06	0.02	0.10	0.00	0.00	0.04	0.00	0.15	0.15
RWVAU #	16	16	16	16	16	16	16	16	16
Normalized Value Score (ABWRET a)	0.70	0.67	0.68	0.43	0.45	0.45	0.46	0.74	0.70
Value Category (a, b, c, d)	d	d	d	d	d	d	d	c	d
Abundance Factor	0	0	0	0	0	0	0	0	0
Final Score(A, B, C, D)	D	D	D	D	D	D	D	C	D

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Classification: Protected A

Function (ABWRET-A Raw Score)	W2346	W2348	W2416	W2418	W2443	W2533	W2536	W2623	W1362b
Surface Water Storage (WS)	6.30	3.77	2.91	5.94	5.87	2.93	5.97	6.14	5.70
Stream Flow Support (SFS)	0.00	3.08	4.25	0.00	0.00	0.00	0.00	0.00	0.00
Streamwater Cooling (WC)	0.00	2.42	3.56	0.00	0.00	0.00	0.00	0.00	0.00
Sediment & Toxicant Retention & Stabilization (SR)	10.00	4.18	3.81	10.00	10.00	10.00	10.00	10.00	10.00
Phosphorus Retention (PR)	10.00	3.87	3.19	10.00	10.00	10.00	10.00	10.00	10.00
Nitrate Removal & Retention (NR)	10.00	4.53	3.88	10.00	10.00	10.00	10.00	10.00	10.00
Organic Nutrient Export (OE)	0.00	3.16	5.08	0.00	0.00	0.00	0.00	0.00	0.00
Fish Habitat (FH)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Aquatic Invertebrate Habitat (INV)	4.89	4.69	4.78	4.86	4.67	4.47	4.69	5.86	4.60
Amphibian Habitat (AM)	2.53	2.39	2.40	2.32	2.42	2.23	2.42	2.91	2.40
Waterbird Habitat (WB)	4.75	4.02	4.67	4.27	4.29	4.06	4.70	5.06	4.06
Songbird, Raptor, & Mammal Habitat (SBM)	2.98	2.52	3.21	3.03	2.80	2.76	3.08	10.00	2.53
Pollinator & Native Plant Habitat (PH)	2.19	2.88	3.05	2.43	3.03	2.01	2.35	3.71	2.72
Human Use & Recognition (HU)	1.79	1.15	1.30	1.66	1.00	1.29	1.86	1.60	1.09
Function (ABWRET-A Normalized Score)	W2346	W2348	W2416	W2418	W2443	W2533	W2536	W2623	W1362b
Surface Water Storage (WS)	0.87	0.43	0.28	0.81	0.80	0.28	0.81	0.84	0.77
Stream Flow Support (SFS)	0.00	0.50	0.69	0.00	0.00	0.00	0.00	0.00	0.00
Streamwater Cooling (WC)	0.00	0.35	0.52	0.00	0.00	0.00	0.00	0.00	0.00
Sediment & Toxicant Retention & Stabilization (SR)	1.00	0.25	0.20	1.00	1.00	1.00	1.00	1.00	1.00
Phosphorus Retention (PR)	1.00	0.26	0.18	1.00	1.00	1.00	1.00	1.00	1.00
Nitrate Removal & Retention (NR)	1.00	0.15	0.05	1.00	1.00	1.00	1.00	1.00	1.00
Organic Nutrient Export (OE)	0.00	0.49	0.78	0.00	0.00	0.00	0.00	0.00	0.00
Fish Habitat (FH)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Aquatic Invertebrate Habitat (INV)	0.48	0.45	0.47	0.48	0.45	0.43	0.46	0.61	0.44
Amphibian Habitat (AM)	0.32	0.29	0.30	0.28	0.30	0.27	0.30	0.38	0.29
Waterbird Habitat (WB)	0.35	0.26	0.34	0.29	0.29	0.27	0.34	0.39	0.27
Songbird, Raptor, & Mammal Habitat (SBM)	0.26	0.17	0.30	0.27	0.23	0.22	0.28	1.00	0.18
Pollinator & Native Plant Habitat (PH)	0.08	0.20	0.23	0.12	0.23	0.05	0.11	0.35	0.17
Human Use & Recognition (HU)	0.15	0.02	0.05	0.12	0.00	0.05	0.16	0.11	0.01
Normalized Score (ABWRET_A) Based on Wetlands in RWVAU	W2346	W2348	W2416	W2418	W2443	W2533	W2536	W2623	W1362b
Normalized Hydrological Health (HH)	0.87	0.50	0.69	0.81	0.80	0.28	0.81	0.84	0.77
Normalized Water Quality (WQ)	1.00	0.49	0.78	1.00	1.00	1.00	1.00	1.00	1.00
Normalized Ecological Health (EH)	0.48	0.45	0.47	0.48	0.45	0.43	0.46	1.00	0.44
Normalized Human Use (HU)	0.15	0.02	0.05	0.12	0.00	0.05	0.16	0.11	0.01
RWVAU #	16	16	16	16	16	16	16	16	16
Normalized Value Score (ABWRET a)	0.72	0.43	0.59	0.70	0.68	0.52	0.70	0.86	0.66
Value Category (a, b, c, d)	c	d	d	d	d	d	d	b	d
Abundance Factor	0	0	0	0	0	0	0	0	0
Final Score(A, B, C, D)	C	D	D	D	D	D	D	B	D

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Classification: Protected A

Function (ABWRET-A Raw Score)	W2107A	W2642	W0139A	W1068	W0974b	W2350	W0632a
Surface Water Storage (WS)	6.02	6.03	6.35	3.37	3.38	5.93	6.53
Stream Flow Support (SFS)	0.00	0.00	0.00	3.72	3.50	0.00	0.00
Streamwater Cooling (WC)	0.00	0.00	0.00	4.06	3.54	0.00	0.00
Sediment & Toxicant Retention & Stabilization (SR)	10.00	10.00	10.00	3.03	4.29	10.00	10.00
Phosphorus Retention (PR)	10.00	10.00	10.00	3.37	3.71	10.00	10.00
Nitrate Removal & Retention (NR)	10.00	10.00	10.00	4.71	4.89	10.00	10.00
Organic Nutrient Export (OE)	0.00	0.00	0.00	5.10	4.88	0.00	0.00
Fish Habitat (FH)	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Aquatic Invertebrate Habitat (INV)	4.61	4.50	4.70	5.00	5.11	5.39	4.92
Amphibian Habitat (AM)	2.45	2.43	2.68	2.47	2.63	3.16	2.41
Waterbird Habitat (WB)	4.26	4.07	5.13	4.45	4.60	4.62	4.47
Songbird, Raptor, & Mammal Habitat (SBM)	2.83	2.76	3.21	3.02	3.11	3.40	3.19
Pollinator & Native Plant Habitat (PH)	2.36	2.42	2.91	2.92	2.74	3.21	3.36
Human Use & Recognition (HU)	0.98	0.90	1.96	1.64	0.97	1.16	1.90
Function (ABWRET-A Normalized Score)	W2107A	W2642	W0139A	W1068	W0974b	W2350	W0632a
Surface Water Storage (WS)	0.82	0.82	0.88	0.36	0.36	0.81	0.91
Stream Flow Support (SFS)	0.00	0.00	0.00	0.60	0.57	0.00	0.00
Streamwater Cooling (WC)	0.00	0.00	0.00	0.59	0.52	0.00	0.00
Sediment & Toxicant Retention & Stabilization (SR)	1.00	1.00	1.00	0.10	0.26	1.00	1.00
Phosphorus Retention (PR)	1.00	1.00	1.00	0.20	0.24	1.00	1.00
Nitrate Removal & Retention (NR)	1.00	1.00	1.00	0.18	0.21	1.00	1.00
Organic Nutrient Export (OE)	0.00	0.00	0.00	0.79	0.75	0.00	0.00
Fish Habitat (FH)	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Aquatic Invertebrate Habitat (INV)	0.45	0.43	0.46	0.50	0.51	0.55	0.49
Amphibian Habitat (AM)	0.30	0.30	0.34	0.31	0.33	0.42	0.30
Waterbird Habitat (WB)	0.29	0.27	0.40	0.31	0.33	0.33	0.32
Songbird, Raptor, & Mammal Habitat (SBM)	0.23	0.22	0.30	0.27	0.29	0.34	0.30
Pollinator & Native Plant Habitat (PH)	0.11	0.12	0.21	0.21	0.18	0.26	0.29
Human Use & Recognition (HU)	0.00	0.00	0.18	0.12	0.00	0.02	0.17
Normalized Score (ABWRET_A) Based on Wetlands in RWVAU	W2107A	W2642	W0139A	W1068	W0974b	W2350	W0632a
Normalized Hydrological Health (HH)	0.82	0.82	0.88	0.60	0.57	0.81	0.91
Normalized Water Quality (WQ)	1.00	1.00	1.00	0.79	0.75	1.00	1.00
Normalized Ecological Health (EH)	0.45	0.43	0.46	0.50	0.51	0.55	0.49
Normalized Human Use (HU)	0.00	0.00	0.18	0.12	0.00	0.02	0.17
RWVAU #	16	16	16	16	16	16	16
Normalized Value Score (ABWRET a)	0.68	0.68	0.72	0.58	0.55	0.71	0.74
Value Category (a, b, c, d)	d	d	c	d	d	d	c
Abundance Factor	0	0	0	0	0	0	0
Final Score(A, B, C, D)	D	D	C	D	D	D	C

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Jun 1, 2015

Classification: Protected A

APPENDIX F

**Documentation of Imagery Sources
used to Identify and Delineate
Wetland Boundaries**

Photo Date (dd-mmm-yy)	Photograph ID (Roll AS#-Photo#)	Resolution	Season ^(a)	Precipitation			Photograph Notes	Wetland ID Alberta Wetland Classification System Wetland Class	W0098 M-G (II)	W1362a M-G (II)	W1362b M-G(II)	W139a M-G (II)	W2142 M-G (III)	W2245 M-G (III)	W2276 M-G (II)	W2283 M-G (II)	W2343 M-G (III)	W2348 M-G (III)		
				Year ^(b)	Month ^(b)	Alberta Wetland Classification System Wetland Class													Precipitation in 2 weeks prior (mm)	
01-May-50	AS151	1:40,000	S	-	-	-	-	Precipitation data is not available for 1950. The landscape is dominated by agriculture. Wetland areas are highly visible in this photo.	Open Water Visible or Consistent Wetland Vegetation Signature^(c)	Water Visible	DV	DV	Water Visible	Water Visible	Water Visible	DV	DV	Water Visible	Water Visible	
									Assessment of Permanence^(d)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
									Wetland Area^(e) (ha)	0.43	0.06	0.06	4.18	1.55		1.16	0.23	1.77	1.77	
									Wetland Description	Wetland boundaries are distinct for the north portion of the wetland. There are a few darker areas in the centre and the south portion indicating a higher permanence for the wetland here.	Wetland boundaries are not very distinct. Wetland vegetation is graminoid dominated and appears darker than adjacent vegetation.	Wetland boundaries are distinct. The wetland appears lighter than the surroundings.	Wetland boundaries are distinct. The wetland appears as a drainage and is much larger than the current delineation based on recent imagery.	Wetland has distinct boundaries. Wetland vegetation is graminoid and appears inundated with water.	Wetland has distinct boundaries. Wetland vegetation is graminoid dominated and appears inundated with water.	Wetland has distinct boundaries. Wetland vegetation is graminoid dominated and appears darker than adjacent vegetation.	Wetland has distinct boundaries. Wetland vegetation is graminoid dominated and appears darker than adjacent vegetation.	Wetland has distinct boundaries. Wetland vegetation is graminoid dominated and appears darker than adjacent vegetation. The south portion of the wetland appears inundated with water.	Wetland has distinct boundaries. Wetland vegetation is graminoid dominated and appears darker than adjacent vegetation. The south portion of the wetland appears inundated with water.	
27-May-63	AS867	1:31,680	S	W	N	0.78	14.19	The 1963 photo is from a wet year and normal month. The landscape is still dominated by agriculture.	Open Water Visible or Consistent Wetland Vegetation Signature^(c)	DV	n/a	DV	DVI	DV	DV	DV	DV	DV	DV	DV
									Assessment of Permanence^(d)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
									Wetland Area^(e) (ha)	0.29	-	0.03	-	2.73	0.49	0.29	0.12	1.11	1.11	
									Wetland Description	Wetland boundaries are not clearly defined, and wetland appears to have more shrubs or trees compared to the 1950.	Wetland is not evident in this photograph. Land use appears to be a farmyard residential property.	Wetland boundaries are not clearly defined. Graminoid vegetation visible but difficult to distinguish from adjacent vegetation.	Wetland boundaries are not clearly defined. Shrubby vegetation visible with a dark area but difficult to distinguish from adjacent vegetation.	Wetland boundaries are distinct. Wetland vegetation is graminoid dominated and appears darker than adjacent vegetation.	Wetland boundaries are distinct. Wetland vegetation is graminoid dominated and appears darker than adjacent vegetation.	Wetland has distinct boundaries. Wetland vegetation is graminoid dominated and appears darker than adjacent vegetation.	Wetland boundaries are somewhat clearly defined. Wetland vegetation is graminoid dominated and surrounded by shrubby vegetation.	Wetland has distinct boundaries. Wetland vegetation is graminoid dominated and appears darker than adjacent vegetation. Wetland appears drier compared to 1950 image.	Wetland has distinct boundaries. Wetland vegetation is graminoid dominated and appears darker than adjacent vegetation. Wetland appears drier compared to 1950 image.	

Photo Date (dd-mmm-yy)	Photograph ID (Roll AS#-Photo#)	Resolution	Season ^(a)	Precipitation		Alberta Wetland Classification System Wetland Class	Precipitation in 2 weeks prior (mm)	Photograph Notes	Wetland ID										
				Year ^(b)	Month ^(b)				Alberta Wetland Classification System Wetland Class	W0098 M-G (II)	W1362a M-G (II)	W1362b M-G(II)	W139a M-G (II)	W2142 M-G (III)	W2245 M-G (III)	W2276 M-G (II)	W2283 M-G (II)	W2343 M-G (III)	W2348 M-G (III)
04-Aug-70	AS1108	1:80,000	Sum	N	D	0	42.99	The 1970 photo is from a dry month during a normal precipitation year. Agriculture is still the dominant land use.	Open Water Visible or Consistent Wetland Vegetation Signature^(c)	DV	n/a	DV	DV	Water visible	DV	DV	DV	DV	DV
									Assessment of Permanence^(d)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
									Wetland Area^(e) (ha)	1.04	-	0.34	3.75	2.99	0.24	0.08	0.35	1.09	1.09
									Wetland Description	Wetland boundaries are distinct. Wetland vegetation is graminoid dominated and darker than adjacent vegetation.	Wetland is not evident in this photograph. Land use appears to be a farmyard residential property.	Wetland boundaries are not clearly defined. Graminoid vegetation is visible and is surrounded by shrubby vegetation.	Wetland boundaries are distinct. Wetland appears lighter than surroundings and delineation is much smaller than previous years.	Wetland boundaries are distinct. Wetland appears to be inundated with water.	Wetland boundaries are somewhat defined. Wetland vegetation is graminoid dominated and darker than adjacent vegetation.	Wetland boundaries are somewhat defined. Wetland vegetation is graminoid dominated and darker than adjacent vegetation.	Wetland boundaries are distinct. Wetland vegetation is graminoid dominated and darker than adjacent vegetation.	Wetland boundaries are distinct. Wetland vegetation is graminoid dominated and darker than adjacent vegetation.	Wetland boundaries are distinct. Wetland vegetation is graminoid dominated and darker than adjacent vegetation.
08-Jun-80	AS2213	1:30,000	Sum	W	W	3.50	43.5	The 1980 photo is from a wet month during a wet year. Agriculture is the dominant land use.	Open Water Visible or Consistent Wetland Vegetation Signature^(c)	DV	n/a	DVI	DVI	DV	DV	DV	DV	DV	DV
									Assessment of Permanence^(d)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
									Wetland Area^(e) (ha)	1.18	-	0.18	0.58	2.64	0.78	0.04	0.54	1.69	1.69
									Wetland Description	The wetland boundaries are distinct. Wetland vegetation appears to be shrubby and is darker than the surrounding vegetation.	Wetland is not evident in this photograph. Land use appears to be a farmyard residential property.	The wetland boundary is obscured by trees or shrubs and difficult to distinguish from adjacent vegetation. Trees or shrubs are the dominant vegetation surrounding the wetland. Wetland appears to be inundated with water in the central basin.	The wetland boundary is difficult to distinguish from adjacent agricultural vegetation. The wetland appears lighter than the surroundings.	Wetland boundaries are clearly defined. Wetland vegetation is graminoid dominated and appears to be darker than the surroundings. The central and north portion appears to have water.	The wetland boundary is clearly defined. Wetland vegetation is graminoid dominated and appears to be darker than the surroundings. The wetland is surrounded by agricultural land.	The wetland boundary is difficult to distinguish from adjacent vegetation. The delineation is much smaller than previous years.	Wetland boundaries are clearly defined. Wetland vegetation is graminoid dominated and darker than the surroundings.	Wetland boundaries are clearly defined. Wetland vegetation is graminoid. The east corner of the wetland appears to be inundated with water.	Wetland boundaries are clearly defined. Wetland vegetation is graminoid. The east corner of the wetland appears to be inundated with water.

Photo Date (dd-mmm-yy)	Photograph ID (Roll AS#-Photo#)	Resolution	Season ^(a)	Precipitation			Precipitation in 2 weeks prior (mm)	Photograph Notes	Wetland ID											
				Year ^(b)	Month ^(b)	Alberta Wetland Classification System Wetland Class			Alberta Wetland Classification System Wetland Class	W0098 M-G (II)	W1362a M-G (II)	W1362b M-G(II)	W139a M-G (II)	W2142 M-G (III)	W2245 M-G (III)	W2276 M-G (II)	W2283 M-G (II)	W2343 M-G (III)	W2348 M-G (III)	
13-Sep-93	AS4417	1:30,000	F	N	N	0	15.79	The 1993 photo is from a normal precipitation month and year. Agriculture is the dominant land use.	Open Water Visible or Consistent Wetland Vegetation Signature ^(c)	DV	n/a	DV	DV	DV	DV	DV	DV	DV	DV	
									Assessment of Permanence ^(d)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
									Wetland Area ^(e) (ha)	0.43	-	-	0.10	11.41	0.32	0.71	0.04	0.73	0.73	
									Wetland Description	The wetland boundary is clearly defined for the north portion. The north portion is dominated by shrubby vegetation, while the south portion is dominated by graminoid vegetation.	Wetland is not evident in this photograph. Land use appears to be a farmyard residential property.	The wetland boundary is somewhat defined. It is dominated by graminoid vegetation and is darker than the surrounding vegetation.	Wetland boundary is not clearly defined and is hard to distinguish from surrounding agricultural land.	The wetland boundary is distinct. It is dominated by graminoid vegetation, appears darker than surrounding vegetation, and is surrounded by agricultural land.	The wetland boundary is distinct. It is dominated by graminoid vegetation, appears darker than surrounding vegetation, and is surrounded by agricultural land.	The wetland boundary is distinct. It is dominated by graminoid vegetation and appears darker than surrounding vegetation.	The wetland boundary is distinct. It is dominated by graminoid vegetation and appears lighter than surrounding vegetation.	The wetland boundary is distinct. It is dominated by graminoid vegetation, appears darker than surrounding vegetation, and is surrounded by agricultural land.	The wetland boundary is distinct. It is dominated by graminoid vegetation, appears darker than surrounding vegetation, and is surrounded by agricultural land.	

Photo Date (dd-mmm-yy)	Photograph ID (Roll AS#-Photo#)	Resolution	Season ^(a)	Precipitation			Precipitation in 2 weeks prior (mm)	Photograph Notes	Wetland ID											
				Year ^(b)	Month ^(b)	Alberta Wetland Classification System Wetland Class			Alberta Wetland Classification System Wetland Class	W0098 M-G (II)	W1362a M-G (II)	W1362b M-G(II)	W139a M-G (II)	W2142 M-G (III)	W2245 M-G (III)	W2276 M-G (II)	W2283 M-G (II)	W2343 M-G (III)	W2348 M-G (III)	
2009	-	-	-	D	-	-	-	The 2010 photo is from a dry year. Agriculture is the dominant land use.	Open Water Visible or Consistent Wetland Vegetation Signature^(c)	n/a	n/a	n/a	DV	n/a	n/a	n/a	DV	DV	DV	
									Assessment of Permanence^(d)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	
									Wetland Area^(e) (ha)	-	-	-	0.94	-	-	-	0.30	0.21	0.24	
									Wetland Description	There is no aerial coverage for this wetland.	There is no aerial coverage for this wetland.	There is no aerial coverage for this wetland.	Wetland boundary is somewhat distinct. It is dominated by graminoid vegetation and darker than surroundings. The wetland appears to have a drainage going through it from north to south.	There is no aerial coverage for this wetland.	There is no aerial coverage for this wetland.	There is no aerial coverage for this wetland.	There is no aerial coverage for this wetland.	Wetland boundary is somewhat distinct. It is dominated by graminoid vegetation and darker than surroundings. It is surrounded by agricultural land.	The wetland boundary is somewhat clearly defined. Wetland vegetation is graminoid dominated and appears slightly darker than agricultural land. It is not a wetland complex with W2348 in this imagery.	Wetland boundaries are clearly defined. Wetland vegetation is graminoid dominated and surrounded by agricultural fields. The east portion appears to be inundated by water. It is not a wetland complex with W2343 in this imagery.

ha = hectare; mm = millimetre; n/a = not applicable; "-"= data not available.

a) S = Spring (April to June); Sum = Mid-late Summer (June to September); F = Fall (September to November).

b) D = Drier; W = Wetter, N=Normal (GOA 2022d).

c) DV = Dry, vegetated (consistent with wetland class); DVI = Dry, vegetated (indistinguishable from surrounding uplands).

d) Y = Yes (Reasonably Permanent, a Sec. 3 *Public Lands Act* (GOA 2000b) body of water); N = No (Not permanent, a wetland regulated under *Water Act*); n/a = not applicable (i.e., seasonal permanence or lower)

e) Areas calculated using NAD83 12U projection.

f) W2343 and W2348 are delineated as one wetland polygon between 1950 and 2003.

wsp

wsp.com

APPENDIX H

***Water Act Approval/Notification –
Temporarily Impacted Wetlands***



APPROVAL
PROVINCE OF ALBERTA
Water Act, RSA 2000, c.W-3, as amended

APPROVAL NUMBER: DAUT0013330

EFFECTIVE DATE: 2023-09-19

EXPIRY DATE: 2026-04-30

ACTIVITY LOCATION: SW-25-039-14-W4, NE-10-040-14-W4, SW-33-039-14-W4, SE-33-039-14-W4, NE-02-040-15-W4, SE-07-040-14-W4, SW-11-040-14-W4, SW-04-040-14-W4, SW-34-039-14-W4, NW-34-039-14-W4, SE-34-039-15-W4, NE-04-040-14-W4, SE-04-040-14-W4, NE-06-040-14-W4, NW-04-040-15-W4, NW-03-040-15-W4, SW-06-040-14-W4, SW-01-040-15-W4, NW-06-040-14-W4, SW-07-040-14-W4, NE-04-040-15-W4, SW-09-040-14-W4, SE-10-040-14-W4, SW-35-039-15-W4, SW-09-040-15-W4, SE-35-039-14-W4, SE-09-040-15-W4, SW-03-040-14-W4, NW-35-039-14-W4, SW-12-040-15-W4, SE-12-040-15-W4, NW-01-040-15-W4, NW-33-039-14-W4, SE-03-040-15-W4,

APPROVAL HOLDER: Capital Power Generation Services Inc

Pursuant to the Water Act, R.S.A. 2000, c. W-3, as amended, an Approval is issued to the Approval Holder to commence, continue, discontinue the following activities:

- placing, constructing, operating, maintaining, removing, disturbing works, in or on any land, water or water body;
- maintaining, removing or disturbing ground, vegetation or other material in or on any land, water or water body;

("the Activity")

Subject to the attached terms and conditions:

Designated Director under the Water Act: *Angela Fulton*

Date Signed: 2023-09-19



TERMS AND CONDITIONS

1. DEFINITIONS

5050. All definitions from the Act and the Regulations apply except where expressly defined in this approval.

5060. In all parts of this Approval:

- a. "Act" means the Water Act, RSA 2000, c. W-3, as amended;
- b. "Application" means the written submissions to the Director in respect of application number DAPP0055957 and any subsequent applications for amendments of Approval Number DAUT0013330;
- c. "Director" means an employee of the Government of Alberta designated as a Director under the Act;
- d. "Maintenance" means the routine repair, upkeep and preservation of the activity authorized under this Approval;
- e. "Minimization of wetland impacts" means reducing negative impacts on wetlands as described in the Alberta Wetland Policy, Alberta Government, September 2013, as amended;
- f. "Regulations" means the regulations, as amended, enacted under the authority of the Act.

2. GENERAL

5200. The Approval Holder shall immediately report to the Director by telephone, any contravention of the terms and conditions of this approval at 1-780-422-4505.

5210. The terms and conditions of this Approval are severable. If any term or condition of this Approval is held invalid, the application of such term or condition to other circumstances and the remainder of this Approval shall not be affected thereby.

5220. The Approval Holder shall not deposit or cause to be deposited any substance in, on, or around the water body that has, or may have, the potential to adversely affect the water body.

5230. The Approval Holder shall retain a copy of this Approval at the site of the activity.

3. PARTICULARS

5240. This Approval is appurtenant to the temporary disturbance of wetlands located in SW-25,



S1/2, NW-33, W 1/2-34, SE,NW-35-039-14-W4, SW-3, SW, E1/2-4, NE, W 1/2-6, S 1/2-7, SW-9, E 1/2-10, SW-11-040-14-W4, SE-34, SW-35-039-15-W4, W 1/2-1, NE-2, NW, SE-3, N 1/2-4, S 1/2-9, S 1/2-12-040-15-W4, as specified in 5250

5250. The Approval Holder shall only undertake the Activity in accordance with the application and the following plan(s) and report(s):

DAPP0055957-P001 Wetland and Waterbody Locations and Delineations in the Halkirk 2 Project Footprint . Dated: September 6, 2023. Prepared by: WSP Canada Inc.

DAPP0055957-R001 Wetland Assessment and Impact Form. Dated: August 16, 2023. Prepared by: WSP Canada Inc., specifically the following sections:

- Section 4.2. Describe how impacts to wetland area and function will be minimized using technically feasible mitigation measures and reclamation techniques
- Section 4.4. Describe the wetland reclamation proposal in accordance with the Wetland Mitigation Directive

5260. The Approval Holder shall retain a copy of the report(s) and plan(s) referred to in 5250 at the site of the Activity at all times while conducting the Activity.

5270. The Approval Holder shall not undertake the Activity in any manner or use any material that causes or may cause an adverse effect on the aquatic environment, human health, property or public safety.

5341. The Approval Holder shall ensure reclamation, including, but not limited to debris disposal, cleanup, slope/bank and topsoil stabilization or replacement and reseeding, shall be done in conjunction with the construction activities.

4. WETLAND MINIMIZATION

5550. The Approval Holder shall implement minimization of wetland impacts, as specified in 5250.

5560. The Approval Holder shall reclaim temporarily lost wetlands, as specified in 5250.

5. SILTATION AND EROSION CONTROL

5480. The Approval Holder shall not do or permit anything to be done, nor omit or permit any omissions, which causes or may cause an adverse effect related to:

- (a) siltation; or
- (b) erosion

as a result of the activity.

6. COMPLAINTS

6000. The Approval Holder shall:

(a) make reasonable efforts to obtain further information regarding complaints of surface water and groundwater interference as a result of the Activity; and

(b) prepare a written report describing the steps taken to comply with (a) including, at a minimum, each of the following:

(i) a detailed description of the efforts taken by the Approval Holder to obtain further information regarding the complaints as required in (a);

(ii) all of the information obtained by the Approval Holder as result of the efforts required in (a);

(iii) recommendations for measures to remediate and mitigate the interference(s) with surface water and groundwater as a result of the Activity;

(iv) detailed information describing how the Approval Holder will implement the measures recommended in (i);

(v) a schedule of implementation for the measures recommended in (i); and

(vi) any other information required in writing by the Director.

6010. Within 30 days of the receipt of the complaint, the Approval Holder shall submit the written report in 6000(b) to the Director.

6020. If the written report in 6000(b) is found deficient by the Director, the Approval Holder shall correct all the deficiencies identified by the Director by the date specified in writing by the Director.

6030. The Approval Holder shall implement the measures in 6000(b) as approved in writing by the Director.

7. CERTIFICATE OF COMPLETION

6040. A Certificate of Completion is not required for this activity.

Wetland Assessment and Impact Form

The Alberta Wetland Assessment and Impact Form (WAIF) is used to support low risk activities in wetlands regulated by Alberta Environment and Parks (AEP) and the Alberta Energy Regulator (AER). For eligible activities listed in Tables 1 and 2 below, the form is to be used in place of the Wetland Assessment and Impact Report (WAIR) and must be submitted with a regulatory application(s) or notification and all required plans.

This form must be authenticated by a qualified professional who:

- meets the requirements in the Wetland Practice Standards (Professional Responsibilities in Completion and Assurance of Wetland Science, Design and Engineering Work in Alberta), or
- has been recognized by AEP under the Transition Period Directive for Professional Responsibilities in Completion and Assurance of Wetland Science, Design and Engineering Work in Alberta

Although this form can be completed as a desktop analysis, the authenticating professional may choose to consider field-based wetland information, where available, to identify, delineate and classify wetlands.

Instructions for submitting a WAIF:

The following documents must be appended to this form and submitted to the regulatory body as one PDF.

- Map of the project boundary, activity footprint, and delineated wetland extent(s) overlaid on current aerial imagery
- Aerial photos and/or imagery used to delineate impacted wetlands
- ABWRET-D results

ABWRET-D: Alberta Wetland Rapid Evaluation Tool - Desktop (ABWRET-D) results must be obtained from AEP and attached to the Wetland Assessment and Impact Form. Wetlands should be delineated in accordance with desktop methods and follow the submission standards in the Alberta Wetland Identification and Delineation Directive.

To obtain ABWRET-D results, submit the completed ABWRET-D Form and delineated wetland shapefile(s) to:

- AEP.Wetlands@gov.ab.ca

Refer to [ABWRET-D Fact Sheet](#) for more information.

1. Project Information

Project name: Halkirk 2 Wind Power Project

Type of activity:

The Halkirk 2 Wind Power Project consists of 31 wind turbines supported by the operational (permanent) footprint and construction (temporary) footprints. This WAIF application addresses the temporary wetland impacts from the temporary footprint, which includes: turbine pad, turbine access road, collector lines, intersection improvements, substation and crane paths.

Applicant name: Capital Power Generation Services Inc.

Related Approval numbers (if available):

DAUT0012446

Name of individual(s) who completed the wetland assessment and WAIF form:

Tehreem Akmal, P.Biol.

Date of assessment:

Year	Month	Day
2023	07	31

Authenticating professional:

Kelli Warren, P.Biol.

Authentication date:

Year	Month	Day
2023	08	16

Professional Regulatory Organization of the Authenticating Professional

Alberta Society of Professional Biologists

Company:

WSP Canada Inc.

2. Wetland Assessment

	Wetland ID	Dominant wetland class and form (AWCS* code)	Delineated wetland area (ha)	Area of temporary wetland impacts (ha)	Area of wetland loss (ha)	ABWRET-D relative wetland value
<input type="checkbox"/> + <input type="checkbox"/> -	W0078	EWB	0.056	0.056		
<input type="checkbox"/> + <input type="checkbox"/> -	W0083	M-G-III	1.570	0.024		B
<input type="checkbox"/> + <input type="checkbox"/> -	W0139	Drainage	0.417	0.048		
<input type="checkbox"/> + <input type="checkbox"/> -	W0139A	M-G-II	0.417	0.061		C
<input type="checkbox"/> + <input type="checkbox"/> -	W0289	EWB	0.880	0.058		
<input type="checkbox"/> + <input type="checkbox"/> -	W0974B	M-G-IV	8.234	0.054		D
<input type="checkbox"/> + <input type="checkbox"/> -	W1068	M-G-IV	0.685	0.047		D
<input type="checkbox"/> + <input type="checkbox"/> -	W1362A	M-G-II	0.195	0.036		D
<input type="checkbox"/> + <input type="checkbox"/> -	W1362B	M-G-II	0.138	0.028		D
<input type="checkbox"/> + <input type="checkbox"/> -	W2004	EWB	0.034	0.020		
<input type="checkbox"/> + <input type="checkbox"/> -	W2044	EWB	0.092	0.092		

	Wetland ID	Dominant wetland class and form (AWCS* code)	Delineated wetland area (ha)	Area of temporary wetland impacts (ha)	Area of wetland loss (ha)	ABWRET-D relative wetland value
<input type="checkbox"/> + <input type="checkbox"/> -	W2075	M-G-II	0.051	0.0002		D
<input type="checkbox"/> + <input type="checkbox"/> -	W2107	SS-III	1.679	0.055		D
<input type="checkbox"/> + <input type="checkbox"/> -	W2107A	M-G-II	0.729	0.235		D
<input type="checkbox"/> + <input type="checkbox"/> -	W2142	M-G-III	1.274	0.025		D
<input type="checkbox"/> + <input type="checkbox"/> -	W2151	M-G-II	0.435	0.0001		D
<input type="checkbox"/> + <input type="checkbox"/> -	W2177	EWB	0.035	0.011		
<input type="checkbox"/> + <input type="checkbox"/> -	W2272	EWB	1.078	0.111		
<input type="checkbox"/> + <input type="checkbox"/> -	W2273	M-G-II	0.878	0.049		D
<input type="checkbox"/> + <input type="checkbox"/> -	W2276	M-G-II	0.105	0.022		D
<input type="checkbox"/> + <input type="checkbox"/> -	W2278	EWB	0.461	0.156		
<input type="checkbox"/> + <input type="checkbox"/> -	W2283	M-G-II	0.100	0.003		D
<input type="checkbox"/> + <input type="checkbox"/> -	W2284	EWB	0.241	0.041		
<input type="checkbox"/> + <input type="checkbox"/> -	W2286	EWB	0.798	0.119		
<input type="checkbox"/> + <input type="checkbox"/> -	W2307	M-G-II	0.116	0.023		D
<input type="checkbox"/> + <input type="checkbox"/> -	W2322	M-G-III	1.862	0.096		C
<input type="checkbox"/> + <input type="checkbox"/> -	W2343	M-G-III	0.320	0.156		D
<input type="checkbox"/> + <input type="checkbox"/> -	W2346	M-G-III	0.799	0.067		C
<input type="checkbox"/> + <input type="checkbox"/> -	W2348	M-G-III	0.392	0.048		D

	Wetland ID	Dominant wetland class and form (AWCS* code)	Delineated wetland area (ha)	Area of temporary wetland impacts (ha)	Area of wetland loss (ha)	ABWRET-D relative wetland value
<input type="checkbox"/> + <input type="checkbox"/> -	W2398	EWB	1.023	0.025		
<input type="checkbox"/> + <input type="checkbox"/> -	W2410	Drainage	5.958	0.198		
<input type="checkbox"/> + <input type="checkbox"/> -	W2416	M-G-III	1.115	0.046		D
<input type="checkbox"/> + <input type="checkbox"/> -	W2443	M-G-II	0.062	0.060		D
<input type="checkbox"/> + <input type="checkbox"/> -	W2457	EWB	0.094	0.003		
<input type="checkbox"/> + <input type="checkbox"/> -	W2522	EWB	0.191	0.012		
<input type="checkbox"/> + <input type="checkbox"/> -	W2533	M-G-II	0.519	0.024		D
<input type="checkbox"/> + <input type="checkbox"/> -	W2539	EWB	0.291	0.064		
<input type="checkbox"/> + <input type="checkbox"/> -	W2640	EWB	0.209	0.191		
<input type="checkbox"/> + <input type="checkbox"/> -	W2641	EWB	0.012	0.010		
<input type="checkbox"/> + <input type="checkbox"/> -	W2642	M-G-II	0.072	0.050		D
<input type="checkbox"/> + <input type="checkbox"/> -	W2643	EWB	0.031	0.015		

*AWCS - Alberta Wetland Classification System

3. Wetland Impacts

3.1. Describe the impacts of the proposed activity to wetland vegetation:

In total, forty one wetlands, drainages, and ephemeral waterbodies have the potential to have a total temporary impact of 2.44 ha. This consists of thirteen temporary wetlands (M-G-II), eight seasonal wetlands (M-G-III), two semi-permanent wetlands (M-G-IV), two drainages, and sixteen ephemeral waterbodies.

Introduction and or the spread of invasive, noxious or prohibited noxious weeds may occur.

3.2. Describe the impacts of the proposed activity to wetland soils:

During construction, soils from the wetlands from the temporary footprints will be stripped. If not handled properly, organic

soils and wetland topsoil may be admixed with upland topsoil or any subsoil material during stripping activities. In addition, erosion and sediment transport could occur during construction, which has the potential to input or remove soils within or away from the remaining portions of the wetland or other undisturbed wetlands in close proximity. There is also potential for compaction and rutting to occur.

3.3. Describe the impacts of the proposed activity to hydrology and water quality:

During construction, there is potential for erosion and sediment transport to occur in the wetlands and this has the potential to negatively affect water quality. Accidental spills during construction works can also affect hydrology and water quality. Impacts to the hydrology and water quality to the wetlands are expected to be temporary with the implementation of the mitigation measures described below.

3.4. State the expected start and end date of the proposed activity:

Start Date:	Year	Month	Day
	2023	10	05
End Date:	Year	Month	Day
	2024	12	01

4. Wetland Mitigation

4.1. Describe efforts for wetland avoidance, in accordance with the Wetland Assessment and Impact Report Directive and Wetland Mitigation Directive, and justify the proposed impacts on the wetland(s):

Preliminary desktop mapping was provided to Capital Power during the initial design phases of the Project. When designing the Project, Capital Power's priority was to avoid impacts to wetlands to the extent possible. The Project footprint is dominated by modified vegetation types including cultivation occupying 66.6% and tame pasture or hay occupying 30.8%. However, Capital Power was unable to avoid temporary wetland impacts to twenty-three wetlands, two drainages, and sixteen ephemeral waterbodies.

4.2. Describe how impacts to wetland area and function will be minimized using technically feasible mitigation measures and reclamation techniques:

The following best management practices will be implemented:

1. All vehicles and construction equipment will be clean (i.e., free of soils and vegetative debris) and disinfected (and documented) prior to arrival on site and cleaned prior to leaving site. Vehicles and equipment will be regularly visually inspected during working hours and cleaning will occur within a designated area (off site).
2. Salvaged soil materials will not be moved between different sites.
3. Areas that exhibit extensive weed infestations prior to disturbance will have soils salvaged and stockpiled separately to prevent the contamination of larger reclamation soil volumes.
4. To reduce available niches for prohibited noxious and noxious weed establishment, stockpiles will be seeded with an approved native seed mix (or in emergencies, an annual cereal crop) as soon as possible.
5. If compaction and rutting is observed, work will be halted, and mitigations will be implemented prior to restarting. This will include stopping work until field conditions are dry, placing rig mats, deep ripping grade or other site specific mitigations.
6. If admixing is observed, mitigations may include having an onsite soil monitor assess upper subsoil placement depths prior to topsoil re-placement segregating admixed soils from non-admixed soils.
7. All wetlands will be de-compacted following construction if compaction is documented.

4.3. State the expected start and end date for meeting wetland reclamation requirements:

Start Date:	Year	Month	Day
	2025	04	01
End Date:	Year	Month	Day
	2025	10	01

4.4. Describe the wetland reclamation proposal in accordance with the Wetland Mitigation Directive (an attachment is acceptable):

Wetlands will be allowed to re-vegetate naturally. No specific re-vegetation efforts will be applied to these areas. However, these areas will be managed for weeds, and additional controls will be applied if revegetation is not successful during Interim Monitoring Site Assessments.

4.5. Will permanent wetland losses that cannot be avoided or reclaimed result from the activity?

Yes (complete 5. *Wetland Replacement* below)

No

5. Wetland Replacement

(leave blank if no permanent loss of wetland area will occur)

	Wetland ID	Area of wetland loss (ha)	ABWRET-D relative wetland value	Replacement ratio	Replacement area (ha)	Relative Wetland Value Assessment Unit	Replacement rate (\$/ha)	Replacement cost
<input type="checkbox"/> + <input type="checkbox"/> -			<input type="text"/>					
<input type="checkbox"/> + <input type="checkbox"/> -			<input type="text"/>					

*If permittee-responsible replacement is proposed, a wetland replacement design proposal must be attached as an appendix to this form

Table 1. Activities regulated by Alberta Environment and Parks that require a Wetland Assessment and Impact Form (WAIF).

Activity	Activity Description	WAIF Eligibility
Outfall structures	<i>Water Act</i> Code of Practice for Outfall Structures on Water Bodies	Yes for shallow open water and marsh classes. No WAIR or WAIF requirements for bogs, fens and swamps at this time
Watercourse crossings	<i>Water Act</i> Code of Practice for Watercourse Crossings	Yes for shallow open water and marsh classes. No WAIR or WAIF requirements for bogs, fens and swamps at this time
Powerlines	<i>Water Act</i> Code of Practice for Powerline Works Impacting Wetlands	Yes, except for no WAIR or WAIF requirements for activities under Section 9(3) of the Code of Practice
Pipelines and Telecommunication Lines	Pipelines and associated infrastructure regulated by the <i>Water Act</i> Code of Practice for Pipelines and Telecommunication Lines Crossing a Water Body	Yes for shallow open water and marsh classes. No WAIR or WAIF requirements for bogs, fens and swamps at this time
	Pipeline related infrastructure outside of the pipeline right of way - includes Cathodic Protection/Anode Bed, Header or Riser Site, Heater, Meter Station Site, Valve Site	Yes
Road widening, improvement and maintenance	Widening, improvements or maintenance of an existing road within a registered road plan right of way or within 15 m from centerline of an existing unregistered or private road. This does not include new road construction.	Yes
Access - Road construction	Road construction - all weather roads up to a maximum of 30 m Right-of-Way width (Class II and Class III - All Weather or Dry) and access roads designed for temporary or seasonal use to be used in frozen or dry conditions up to 15 m wide (Class IV - Frozen/Dry Conditions). See Public Lands Administration Regulation (PLAR) Table A1 for more details	WAIF must be used if there is a commitment to reclaim 100% of impacted wetland areas to wetland. Otherwise complete WAIR
	Road construction - minimal disturbance access or ice roads designed for temporary access up to 10 m wide. Ground disturbance, surface vegetation disturbance, grade development and surface improvements are minimized (Class V - Frozen and Class VI - Frozen). See Public Lands Administration Regulation (PLAR) Table A1 for more details	No WAIR or WAIF requirements
Borrow pits, water reservoirs and dugouts	Borrow pits, reservoirs, and dugouts if the volume of the excavated area is less than 2500 cubic metres	Yes
Other	Exploratory test hole, test pit, geotechnical survey	No WAIR or WAIF requirements where activity utilizes by-hand methods. Otherwise, a WAIF is required
	Aquatic vegetation removal	Yes
	Storage (i.e. stockpile)	WAIF must be used if there is a commitment to reclaim 100% of impacted wetland areas to wetland. Otherwise complete WAIR
	Incidental activities	Refer to parent disposition
	Temporary field authorization	Contact AEP.Wetlands@gov.ab.ca
	Recreational dispositions - trails, boardwalks, non-commercial seasonal piers	Contact AEP.Wetlands@gov.ab.ca
	Work Camp - less than or equal to 1 ha and in use for less than 1 year	No WAIR or WAIF requirements
	Monitoring (Research, Monitoring and Education)	No WAIR or WAIF requirements

Note: An enquiry about an activity that will result in low risk impacts as assessed by the authenticating professional can be sent to:

AEP.Wetlands@gov.ab.ca

Table 2. Activities regulated by the Alberta Energy Regulator that require a Wetland Assessment and Impact Form (WAIF).

Activity	Activity Description	WAIF Eligibility
Outfall structures	<i>Water Act</i> Code of Practice for Outfall Structures on Water Bodies	Yes for shallow open water and marsh classes. No WAIR or WAIF requirements for bogs, fens and swamps at this time
Watercourse crossings	<i>Water Act</i> Code of Practice for Watercourse Crossings	Yes for shallow open water and marsh classes. No WAIR or WAIF requirements for bogs, fens and swamps at this time
Powerlines	<i>Water Act</i> Code of Practice for Powerline Works Impacting Wetlands	Yes, except for no WAIR or WAIF requirements for activities under Section 9(3) of the Code of Practice
Pipelines	Pipelines and associated infrastructure regulated by the <i>Water Act</i> Code of Practice for Pipelines and Telecommunication Lines Crossing a Water Body	Yes for shallow open water and marsh classes. No WAIR or WAIF requirements for bogs, fens and swamps at this time
	Pipeline related infrastructure outside of the pipeline right of way - includes Cathodic Protection/Anode Bed, Header or Riser Site, Heater, Meter Station Site, Valve Site	Yes
Road widening, improvement and maintenance	Widening, improvements or maintenance of an existing road within a registered road plan right of way or within 15 m from centerline of an existing unregistered or private road. This does not include new road construction.	Yes
Access - road construction	All weather roads up to a maximum of 30 m Right-of-Way width (Class II and Class III - All Weather or Dry) and access roads designed for temporary or seasonal use to be used in frozen or dry conditions up to 15 m wide (Class IV - Frozen/Dry Conditions). See Public Lands Administration Regulation (PLAR) Table A2 for more details	WAIF must be used if there is a commitment to reclaim 100% of impacted wetland areas to wetland. Otherwise complete WAIR
	Minimal disturbance assess or ice roads designed for temporary access up to 10 m wide. Ground disturbance, surface vegetation disturbance, grade development and surface improvements are minimized (Class V - Frozen and Class VI - Frozen). See Public Lands Administration Regulation (PLAR) Table A2 for more details	No WAIR or WAIF requirements
Access-Temporary	Industrial as defined in Public Lands Administration Regulation (PLAR) Table 2	No WAIR or WAIF requirements
Borrow pits, water reservoirs and dugouts	Borrow pits, reservoirs, and dugouts if the volume of the excavated area is less than 2500 cubic metres	Yes
Coal Exploration Program	Coal Exploration	No WAIR or WAIF requirements at initial application. WAIF must be submitted at the time of conversion of the infrastructure for long term use by applying for a formal disposition (no wetland reporting requirements for Miscellaneous Lease (MLL) - environmental monitoring site)
Oil Sands Exploration	OSE	No WAIR or WAIF requirements at initial application. WAIF must be submitted at the time of conversion of the infrastructure for long term use by applying for a formal disposition (no wetland reporting requirements for Miscellaneous Lease (MLL) - environmental monitoring site)
Storage	Industrial, Stockpile	WAIF must be used if there is a commitment to reclaim 100% of impacted wetland areas to wetland. Otherwise complete WAIR
Incidental Activity	Additional Area - Linear, Non-Linear and Wellbore, Bank Stabilization, Multi Pipe Installation, Push outs	Refer to parent disposition
	Flare Stack, Log Deck, Temporary Workspace	No WAIR or WAIF requirements

Well site (in situ, surface oil and gas)	Disposal, Injection, OS - Cold Production, PNG Production Multi Well (MW), PNG Production Single Well (SW), Storage Well	WAIF must be used if there is a commitment to reclaim 100% of impacted wetland areas to wetland. Otherwise complete WAIR
	Water Monitoring and Water Production Wells, Experimental Wells, Observation Wells	Yes
	OS - Enhanced Recovery (well pads, access for pipelines and power)	WAIF must be used if there is a commitment to reclaim 100% of impacted wetland areas to wetland. Otherwise complete WAIR
Work Camp - industrial	Work camp less than or equal to 1 ha and in use for less than 1 year	No WAIR or WAIF requirements
Other	Geotechnical Investigations (drilling, boreholes)	No WAIR or WAIF requirements where activity utilizes by-hand methods. Otherwise, a WAIF is required
	Geophysical	No WAIR or WAIF requirements
	Monitoring (Research, Monitoring and Education)	No WAIR or WAIF requirements

Note: An enquiry about an activity that will result in low risk impacts as assessed by the authenticating professional can be sent to:

Wetland.Reports@aer.ca

APPENDIX I

AEP-FWS Referral Report

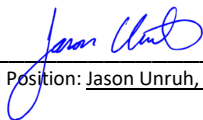
Alberta Environment and Parks - Fish and Wildlife Stewardship Renewable Energy Amendment Letter

The updated Halkirk 2 Wind Power Project (the Project) proposed by Capital Power (Halkirk 2) L.P. (the Proponent) was reviewed by the Alberta Environment and Parks – Fish and Wildlife Stewardship (AEP-FWS) regional wildlife contact for renewable energy projects. AEP-FWS has reviewed the proposed project changes, which include the location, mitigation strategies, including associated infrastructure and construction plans, wildlife and habitat impacts, and post-construction monitoring and mitigation program. Project information was presented by the Proponent in a submission dated May 12, 2022 and accepted by AEP-FWS on June 6, 2022.

The AEP-FWS review of the updated Halkirk 2 Wind Power Project was guided by the AEP-FWS policy document, *Wildlife Directive for Alberta Wind Projects* (September 2018; hereafter called the *Directive*) and the *Post-Construction Survey Protocols for Wind and Solar Energy Projects* (January 2020; hereafter called the *PCMP Protocol*). The Proponent must follow the *Directive* and *PCMP Protocol* for requirements on siting, pre-construction surveys, construction, operation, and post-construction monitoring and mitigation plans.

This amendment letter summarizes the review undertaken by AEP-FWS that was restricted to reviewing information provided in the submitted documents, completed by WSP Golder on behalf of the Proponent, and applying the wildlife standards and best management practices for the siting, construction and operation of the wind facility. This office undertook no independent on-site assessment. This Renewable Amendment Letter is not intended to relieve any party from any liability if there are detrimental effects to wildlife or wildlife habitat during construction or operation that were not identified and mitigated for in the documents submitted. It is the responsibility of the Proponent to ensure compliance under all other policy and legislation, including but not limited to the *Alberta Wetland Policy*, *Water Act*, *Code of Practice for Watercourse Crossings*, *Environmental Protection and Enhancement Act*, *Alberta Wildlife Act*, *Migratory Bird Convention Act*, and *Species at Risk Act*. Federal requirements may differ from AEP-FWS policy, therefore additional consultation may be necessary. AEP-FWS review does not eliminate the need for review by other branches of the Environment and Parks Department, Government of Canada or other governing bodies. This amendment letter summarizes the potential risks to wildlife and wildlife habitat based on the information provided to AEP-FWS.

Signature: _____



Date: June 16, 2022

Printed Name and Position: Jason Unruh, Wildlife Biologist, South Region, Red Deer, Alberta

Amendment Letter Summary

Please see the body of this report along with supporting information found in the project application and the AEP *Wildlife Directive for Alberta Wind Energy Projects* for details on specific topics within this summary.

- All project infrastructure has been removed from native grassland; therefore, the risk to high quality native habitat has been completely reduced, which aligns with the *Directive*.
- There are still numerous impacts to wetlands and wetland setbacks, and so the risk to wetland habitat remains high.
- All impacts to raptor nest setbacks have been removed, and there are no project-related impacts to active sharp-tailed leks; therefore, the risk to sensitive wildlife features is assessed as low.
- The risk to breeding birds has been assessed as low, although there is some risk of disturbance if construction activities occur within tame pasture and hay land during the breeding season (April 1 to July 15).
- The overall risk of mortality to birds has been assessed as high, based on high migratory activity, attractive stopover sites, attractive habitat for grassland breeding birds, and a high abundance of breeding raptors within the project area.
- The risk of mortality to bats has been assessed as high. The mortality risk will be mitigated during operations and mitigations must reduce bat mortalities to acceptable levels.

AEP-FWS has determined the Halkirk 2 Wind Power Project proposed by Capital Power (Halkirk 2) L.P., continues to pose a moderate risk to wildlife and wildlife habitat. This AEP-FWS risk assessment expires on June 16, 2027.

<i>Project Information</i>	<i>Project Details</i>
Project Name	Halkirk 2 Wind Power Project
Municipality/County	County of Paintearth
Project MW	151 MW
Proponent Name	Capital Power (Halkirk 2) L.P.
Consultant Name	WSP Golder
Project Documents Submitted ¹	<ul style="list-style-type: none"> • Halkirk 2 Wind Power Project - Renewable Energy Project Amendment Submission to Alberta Environment and Parks
Date of Risk Assessment Expiry	June 16, 2027
Overall Risk Ranking	Moderate

¹ Note: various clarifications and edits of the original documents are discussed in the subsequent files and these changes are to supersede the original documents.

PROJECT SITING

Native and Critical Habitats

Risk Ranking: Not Applicable Low Moderate High High Unmitigated
Infrastructure sited within suitable habitat or applicable setbacks: Yes No

Comments/Mitigation: The project has removed 100% of the planned impacts to native grassland referenced in the 2017 AEP Referral Report. The project is now sited entirely on pre-disturbed land (cultivated and tame grassland/hayland), which aligns with the *Directive*.

Wetlands

Risk Ranking: Not Applicable Low Moderate High High Unmitigated
Infrastructure sited within suitable habitat or applicable setbacks: Yes No

Comments/Mitigation: The project has reduced the number of planned impacts to wetland habitat as referenced in the 2017 AEP Referral Report. The original project layout planned to impact a total of 227 wetlands and their setbacks. There are now a total of 102 planned impacts to wetlands and wetland setbacks (a reduction of 55%). In summary, five Class III wetlands will have permanent, direct impacts (access roads); four Class III+ wetlands will temporary, direct impacts (collector lines and intersection improvements); 17 Class III+ wetland setbacks will have permanent disturbances (access roads and turbines pads); 76 Class III+ wetland setbacks will have temporary disturbances (access roads, collector lines, intersection improvements). These impacts to wetland habitat do not align with the *Directive*. The proponent has committed to mitigation measures, which are detailed in the referenced project documents, which will reduce some of the impacts to wetland habitat and wildlife; however, there are still a large number of planned impacts and AEP-FWS has assessed the risk to wetland habitat as high.

WILDLIFE FEATURES

Raptor Nests (Sensitive and Non-Sensitive)

Risk Ranking: Low Moderate High High Unmitigated
Is the project sited within the wildlife range/zone? Yes No Not Applicable
Was the survey completed according to the Standards? Yes No Not Applicable
Is the project sited within the setbacks? Yes No

Comments/Mitigation: A total of 27 active raptor nests were observed during surveys in 2021. One of these nests was an active bald eagle nest, which has a 1,000 m setback; the rest have 100 m setbacks. No active nest setbacks will be infringed upon by project infrastructure, which aligns with the *Directive*. This is a 100% reduction in raptor nest setback impacts as referenced in the 2017 AEP Referral Report. Therefore, AEP-FWS has assessed the risk to raptor nests as low.

Sharp-tailed Grouse

Risk Ranking: Low Moderate High High Unmitigated
Is the project sited within the wildlife range/zone? Yes No Not Applicable

Was the survey completed according to the Standards? Yes No Not Applicable

Is the project sited within the setbacks? Yes No

Comments/Mitigation: One active sharp-tailed grouse lek was observed during surveys in 2021. The 500 m lek setback will not be infringed upon by project infrastructure, which aligns with the *Directive*. No sharp-tailed grouse lek impacts were identified in the 2017 AEP Referral Report. Therefore, AEP-FWS has assessed the risk to sharp-tailed grouse leks as low.

BIRD RISK

Breeding Birds

Risk Ranking: Low Moderate High High Unmitigated

Comments/Mitigation: During breeding bird surveys in 2021, only four species at risk were observed (all in low abundance), 19 species of breeding birds were observed in total, and bird abundance was generally low. There are a number of grassland breeding birds nesting within the project area, but project infrastructure has been mostly sited away from high quality breeding bird habitat (e.g. native grassland). However, there is some risk of disturbance to breeding birds during construction where project infrastructure has been sited within tame grassland and hay land. The proponent has identified mitigation measures to reduce these impacts during construction, which are detailed in the referenced project documents. A key mitigation measure will be avoidance of collector line installation within tame grassland and hay land habitats during the breeding bird season (April 1 to July 15). AEP-FWS has assessed the risk to breeding birds as low.

Bird Risk

Risk Ranking: Low Moderate High High Unmitigated

Comments/Mitigation: During spring and fall avian migratory surveys in 2021, it was observed that avian migration activity is relatively high within the project area. There are also numerous stopover features within the project area that attract migrating birds. The large amount of native grassland, tame grassland and hay land within the project offers suitable habitat for grassland breeding birds. While project infrastructure has avoided high quality breeding habitat (e.g. native grassland), there is still the risk of mortality to breeding and migrating birds from the turbines during operations. Also, numerous hawks and other raptor species nest within the project area, and turbines pose a high risk of mortality for these species, particularly their young of year. Therefore, AEP-FWS has assessed the overall risk of mortality to birds as high.

BAT RISK (WIND ONLY)

Bat Risk

Risk Ranking: Low Moderate High High Unmitigated

Comments/Mitigation: Bat activity was found to be relatively high during acoustic surveys in 2021. Therefore, AEP-FWS has assessed the risk of mortality to bats as high. This risk will be mitigated by the proponent during operations, which is expected to reduce bat mortalities to acceptable levels.

Other Wildlife Risks

Guy Wires

Risk Ranking: Not Applicable Low Moderate High High Unmitigated

Comments/Mitigation: No guy wires will be used for the project, and the permanent MET tower will be free standing.

Collection Lines

Risk Ranking: Low Moderate High High Unmitigated

Comments/Mitigation: All collector lines will be sited underground. Collector lines will be installed outside of April 1 to July 15 within tame pasture or hay land; however, this mitigation measure may be 'stepped down' to performing nest sweeps during this time period, which will not be as effective of a mitigation for grassland breeding birds. AEP-FWS has assessed the risk of collector lines as low.

Post Construction Monitoring Plan

Risk Ranking: Low High High Unmitigated

Has the Proponent committed to post-construction monitoring that follows requirements outlined in the *PCMP Protocol*? (Post-construction monitoring reports must be submitted to AEP-FWS and the AUC annually by the end of January following the mortality monitoring period). Yes No

Post Construction Mitigation Plan

Risk Ranking: Low Moderate High High Unmitigated

Has the Proponent identified appropriate post-construction mitigation to address risk to wildlife or wildlife habitat as per the intent of the Directives? Yes No

Comments: Potential mitigation options to reduce high bird and/or bat fatalities include increasing wind cut-in speed, feathering or altering the pitch angle of turbine blades, and introducing seasonal curtailment during the migratory period (specifically during nighttime for bats).

APPENDIX J

**Standard Requirements Under the
Historical Resources Act**



STANDARD REQUIREMENTS UNDER THE *HISTORICAL RESOURCES ACT*: REPORTING THE DISCOVERY OF HISTORIC RESOURCES

If development proponents and/or their agents become aware of historic resources during the course of development activities, they are required, under Section 31 of the *Historical Resources Act*, to report these discoveries to the Heritage Division of Alberta Culture and Status of Women. This requirement applies to all activities in the Province of Alberta.

1.0 REPORTING THE DISCOVERY OF ARCHAEOLOGICAL RESOURCES

The discovery of archaeological resources is to be reported to Darryl Bereziuk, Director, Archaeological Survey, at 780-431-2316 (toll-free by first dialing 310-0000) or darryl.bereziuk@gov.ab.ca.

2.0 REPORTING THE DISCOVERY OF PALAEOLOGICAL RESOURCES

The discovery of palaeontological resources is to be reported to Dan Spivak, Head, Resource Management, Royal Tyrrell Museum of Palaeontology, at 403-820-6210 (toll-free by first dialing 310-0000) or dan.spivak@gov.ab.ca.

3.0 REPORTING THE DISCOVERY OF HISTORIC PERIOD SITES

The discovery of historic structures to be reported to Rebecca Goodenough, Manager, Historic Places Research and Designation Program, at 780-431-2309 (toll-free by first dialing 310-0000) or rebecca.goodenough@gov.ab.ca. Please note that some historic structure sites may also be considered Aboriginal traditional use sites.

4.0 REPORTING THE DISCOVERY OF ABORIGINAL TRADITIONAL USE SITES

The discovery of any Aboriginal traditional use site that is of a type listed below is to be reported to Valerie Knaga, Director, Aboriginal Heritage Section, at 780-431-2371 (toll-free by first dialing 310-0000) or valerie.k.knaga@gov.ab.ca.

Aboriginal Traditional Use sites considered by Alberta Culture and Status of Women to be historic resources under the *Historical Resources Act* include:

- Historic cabin remains;
- Historic cabins (unoccupied);
- Cultural or historical community camp sites;



STANDARD REQUIREMENTS UNDER THE *HISTORICAL RESOURCES ACT*: REPORTING THE DISCOVERY OF HISTORIC RESOURCES

Ceremonial sites/Spiritual sites;
Gravesites;
Historic settlements/Homesteads;
Historic sites;
Oral history sites;
Ceremonial plant or mineral gathering sites;
Historical Trail Features; and,
Sweat/Thirst/Fasting Lodge sites

5.0 FURTHER SALVAGE, PRESERVATIVE OR PROTECTIVE MEASURES

If previously unrecorded historic resources are discovered, proponents may be ordered to undertake further salvage, preservative or protective measures or take any other actions that the Minister of Culture considers necessary.

Capital 
Power