CFB SUFFIELD NATIONAL WILDLIFE AREA
SHALLOW GAS INFILL DEVELOPMENT
PROJECT

PROJECT DESCRIPTION

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1.0 INTRODUCTION

This document is the project description for the Canadian Forces Base (“CFB”) Suffield National Wildlife Area (“NWA”) Shallow Gas Infill Development Project (the “Project”) proposed by EnCana Corporation (“EnCana”). The Project is designed to extract sweet, shallow gas from the NWA and deliver that gas to market. A project description is provided to assist the Department of National Defence (“DND”), in coordination with the Canadian Environmental Assessment Agency (“Agency”), in determining the level of environmental assessment required under the Canadian Environmental Assessment Act, R.S.C. 1992, c. 37 (“CEAA”) and to provide for the efficient coordination of the environmental assessment process.

1.1 PROJECT OVERVIEW

The Project is a continuation of EnCana’s existing shallow gas infill well development throughout the NWA. Infill drilling is drilling that occurs within the boundaries of an existing developed gas or oil field. The infill drilling that is part of this Project is necessary to efficiently produce the shallow gas reserves within the NWA that have been located by previous drilling programs. The Project is anticipated to fulfill all the infill development necessary in the NWA. Associated with these wells will be pipelines to connect the wells into existing and new infrastructure for delivery to market. In order to minimize the impact on wildlife and wildlife habitat in the NWA, it is anticipated that project construction will occur, for the most part, between October and April, over a three year period.

As a precursor to this project, EnCana conducted a 16 wells per section (“wps”) pilot project in the Riverbank and Middle Sandhills areas of the NWA. The pilot project evaluated the geological and economic suitability of the area for infill drilling. The project confirmed the suitability of the area for infill drilling. AXYS Environmental Consulting Ltd. (“AXYS”) was contracted to complete a post construction vegetation assessment to assess the impact of the pilot project on the vegetation within the pilot project area. The information gained from the pilot project and the AXYS assessment will be utilized to optimize operations in the NWA, to prepare the environmental assessment for the Project and to evaluate cumulative effects in the NWA.

1.1.1 Purpose of the Project

The primary purpose of the Project is to allow EnCana to exercise its rights under, and obtain economic benefits from, the natural gas leases issued to it by the Province of Alberta within the NWA. Additionally, the Project will allow EnCana to exercise the rights assigned to it by the Province of Alberta, as a result of an Agreement between the Government of Canada and the Government of Alberta under which the Government of Alberta was granted the right of access to, entry upon and occupation and use of such portions of the NWA as are required for shallow gas development.
By recovering the value of the reserves that EnCana obtained the rights to produce, it can provide a return to its shareholders on the capital invested in the Project. The value of the reserves recovered by the Project will be obtained by developing the opportunity presented by the considerable and growing demand for natural gas and other forms of energy in markets in Canada and the United States. The proximity of the natural gas reserves located within the NWA to existing infrastructure is an important aspect of the Project.

1.1.2 Project Area

The CFB Suffield Block is located in the Province of Alberta, north of Medicine Hat in Townships 15 to 19, Ranges three (3) to nine (9) west of the fourth (4th) meridian as shown in Map 1 of Appendix A. The Government of Canada owns the surface of the NWA land. The NWA covers the Eastern side of the Suffield military range and is approximately 200 sections in size (approximately 45,800 hectares (113,170 acres) of land).

On March 11, 1992, the Minister of National Defence and the Minister of the Environment signed a Memorandum of Understanding (MOU) that provided the basis for establishing the NWA on a portion of the CFB Suffield. The NWA was formally created when it was listed in Schedule 1 of the Wildlife Area Regulations, C.R.C., c. 1609, on June 19, 2003. Thereafter, pursuant to Section 4.2 of the Canada Wildlife Act, R.S.C. 1985, c. W-9, the Minister of the Environment delegated the powers conferred under the Canada Wildlife Act, in respect of the NWA to the Minister of National Defence. The authority over the NWA was subsequently subdelegated by the Minister of National Defence to the Base Commander of CFB Suffield.

At the time the NWA was formally created, the Regulations Amending the Wildlife Area Regulations (the “Amending Regulations”) were published in Part 1 of the Canada Gazette. The Regulatory Impact Analysis Statement (“RIAS”) which accompanied the Amending Regulations recognized that the “creation of the NWA will make a substantial contribution to conservation and protection of critical habitat for wildlife including species at risk”. It was recognized that the NWA encompasses 458 km$^2$ of prairie grassland of national significance including sand hills, ancient glacial coulees and the riverbank and breaks along the South Saskatchewan River valley. According to the RIAS, natural grasslands and rivers are among the most endangered ecosystems in prairie Canada. The NWA was formed to provide habitat for over 1,100 catalogued species including the 14 federally listed endangered species and 78 provincially listed “at risk” or “sensitive” species in the NWA as well as to provide prairie habitat for migratory birds contributing to Canada’s international commitments under the Migratory Birds Convention, the North American Waterfowl Management Plan, the North American Bird Conservation Initiative, and the United Nations Convention on Biological Diversity. The creation of the NWA was designed to enhance regional wildlife populations while providing a better understanding of the response of the prairie ecosystem to long-term management and
protection of the native habitat. This knowledge is intended to support regional landscape management.

1.1.3 Land Use

The CFB Suffield designated the Suffield Block to be operated by the Canadian Army as a mechanized training area for Canada and Great Britain. Land use on the Block was subdivided in 1971 into three distinct areas: the Military Training Area (MTA), the Defence Research experimental proving grounds (EPG), and the environmentally protected area (EPA) representing approximately 17% of the Base. No military ground training was contemplated in the EPA.

The EPA was formally designated as the CFB Suffield NWA in 2003. The area represents an integral component of the CFB Suffield. Although the NWA has been out of bounds for military ground training since 1972, military use of the area includes live fire safety templates in support of military exercises. Current land use of the NWA also includes its role in conserving and protecting critical wildlife habitat and maintaining the ecological integrity of the prairie grassland within its borders. Other land uses within the NWA include safety templates for defence research trials in adjacent areas and cattle grazing. Cattle grazing are subject to a 1976 Memorandum of Understanding between DND and Agriculture and Agri-Food Canada. Grazing occurs only from June to October and is limited to the Southern portion of the NWA. The grazing activity is overseen by the Suffield Grazing Advisory Committee that is comprised of one member from each of the Canadian Wildlife Service, Alberta Public Lands, and Agriculture and Agri-Food Canada. The Committee recommends the amount of grazing to occur based on grass/feed conditions. For safety reasons, there is no public access to the NWA.

Another important land use within the NWA involves shallow natural gas activities. The first shallow gas wells were drilled in the area that would later become the NWA in 1973. In 1975 the Government of Canada, as the owner of the surface of CFB Suffield, and the Government of Alberta, as the owner of the majority of the mines and minerals underlying CFB Suffield, entered into agreements (the “1975 Agreements”) which granted Alberta and its assignees access to CFB Suffield, including the NWA, for the purposes of exploring for, developing and producing oil and natural gas underlying CFB Suffield. In 1999, a partial assignment agreement between Canada and Alberta granted deep rights surface access for oil and gas at CFB Suffield excepting the NWA. As Alberta’s assignee, EnCana and its predecessor companies have engaged in oil and gas activities on CFB Suffield, and shallow natural gas activities within the NWA, since 1975.

As noted in the previous section, the RIAS recognized that the “creation of the NWA will make a substantial contribution to conservation and protection of critical habitat for wildlife including species at risk”. The RIAS also indicated “no major changes in land use are anticipated” and that:

“Cattle grazing and shallow gas recovery which operate under existing Memoranda of Agreement (MOAs) will continue, subject to environmental
screening protocols identified in respective MOAs controlling those activities and the *Wildlife Area Regulations*.

The existing MOA for shallow gas recovery referred to in the Regulatory Impact Analysis Statement is contained in the 1975 Agreements. The 1975 Agreements established the Suffield Environmental Advisory Committee (“SEAC”) to provide advice to the Base Commander with respect to environmental aspects of oil and gas activities on CFB Suffield. The SEAC is comprised of three members: one member from EC (Canadian Wildlife Service), one member from Alberta Environment and one member from the Alberta Energy and Utilities Board (“EUB”). To date the SEAC has been involved in, and made recommendations for, the approval of all development and reclamation activities in the NWA. The SEAC also conducts annual inspections of EnCana facilities to ensure that proper mitigation measures have been followed. It is anticipated that SEAC will continue in this role.

Of the 1154 existing wells within the NWA, shown on Map 2 of Appendix A, shallow gas comes from a maximum depth of approximately 650 meters. The low impact techniques utilized to drill these existing wells were developed with input from SEAC and include:

- no leveling or stripping of shallow gas well sites;
- suspension of drilling and other activities during unfavorable conditions; and
- removal of all fluids (for drilling and completions) from the NWA.

The current well density in the NWA varies from a low of four (4) wps to a maximum of 16 wps. A section is equivalent to one square mile (640 acres). In several areas, the well density has already been increased to 16 wps with the intention of this Project being additional development to a maximum of 16 locations per section.

The existing 1154 wells within the NWA are tied-in to an existing natural gas gathering (pipeline) system. The majority of the existing gas gathering system consists of two (2) inch (50.8 millimeter) individual well tie-ins that are connected to four (4) to eight (8) inch (101 to 203 millimeter) main laterals. The total amount of existing pipelines in the NWA is estimated at 760 kilometers. Since 2001 in the NWA, all two (2) inch (50.8 millimeter) tie-in lines have utilized plastic polyethylene pipe and have been installed using low impact, minimal disturbance plowing techniques.

The history of the NWA reflects the area’s shared land use between military training and research, wildlife conservation, oil and gas development and cattle grazing. For over 30 years, DND has managed the multiple land uses within the NWA in cooperation with the oil and gas industry, cattle ranchers, Defence Research and Development Canada, and various provincial and federal authorities, in particular, Environment Canada.

1.1.4 Nature of Project
The proposed Project consists of four phases: (1) preparation; (2) construction; (3) operations; and (4) decommissioning and abandonment.

The preparation phase includes the following activities:

- Pre-field project planning (constraints mapping; desktop database search; planning meeting to discuss project well site, pipeline and access locations)
- An environmental assessment will be conducted in the field for each location by an environmental crew (consisting of wildlife specialists, botanists, archeologists (historical resources) other specialists as required (e.g., weeds)), surveyors and construction personnel for each location
- An ordinance sweep will be conducted by Suffield Industry Range Control (SIRC)

The largest activity phase but the smallest temporal phase of the project is the construction phase including the initial drilling, completion and tie-in of the wells. It is anticipated that all of the wells proposed will be drilled, completed and tied-in during a three year period. It is expected that approximately one third of the new wells will be drilled, completed and tied-in in each of the three years; with activities primarily occurring between October and April in order to respect environmental constraints and the military training calendar. A conceptual activity schedule will be provided as part of the environmental assessment and the potential impacts assessed on that basis. The project will not require the installation of compression facilities within the NWA. Existing facilities located outside of the NWA are sufficient for the project to be carried out.

During the operations phase, the following activities will occur regularly to ensure that operations are continuing efficiently: well testing, swabbing (if necessary due to water production), well inspections, recompletions and pipeline integrity checks.

It is anticipated that the wells will continue to produce for twenty or more years. When production is no longer economically feasible, the decommissioning and abandonment of both production and pipeline facilities will be undertaken in accordance with the regulatory requirements applicable at that time. Well sites will be reclaimed using the appropriate seed mixes and methods at the time of decommissioning and abandonment in consultation with the DND. Although abandonment practices may change in the future, the current practice is for pipelines to be abandoned in place in order to minimize disturbance to the environment.
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1.3 REGULATORY OVERVIEW

Natural gas projects in the NWA are regulated by several different agencies and various forms of legislation govern their operations. The Government of Canada owns the surface rights while the Province of Alberta primarily owns the subsurface rights; as such, provincial and federal regulations apply.

1.3.1 Canadian Environmental Assessment Act

**Responsible Authority and Federal Authorities**

The DND will be the responsible authority for the Project as the Minister of Environment has delegated authority over the NWA to the Minister of National Defence, pursuant to Section 4.2 of the Canada Wildlife Act.

In accordance with the *Regulations Respecting the Coordination by Federal Authorities of Environmental Assessment Procedures and Requirements* (Federal Coordination Regulations), the Agency, as the Federal Environmental Assessment Coordinator (FEAC), referred the project to other federal agencies. The following federal
departments have self identified as Federal Authorities (FAs) and will provide specialist advice to the assessment as follows:

- Agriculture and Agri-Food Canada;
- Environment Canada;
- Fisheries and Oceans Canada;
- Health Canada.
- Natural Resources Canada; and
- Parks Canada.

**Provincial Involvement**

In accordance with the *Canada-Alberta Agreement for Environmental Assessment Cooperation (the Agreement)*, the FEAC also referred the project to Alberta Environment (AENV), the Alberta Energy and Utilities Board (AEUB) and Alberta Sustainable Resources Development (ASRD). AENV’s review of the project determined that no provincial environmental assessment is required and AENV has no regulatory interest under the *Environmental Protection and Enhancement Act* (EPEA) or the *Water Act*. Thus, AENV does not wish to participate in a cooperative environmental assessment at this time.

However, the AEUB does have a regulatory interest in oil and gas development at CFB Suffield, as Alberta retains the Crown mineral rights. Public issues and concerns raised during the federal environmental assessment of the project may have direct relevance to the AEUB regulatory process. The AEUB will participate in the federal environmental assessment process pursuant Appendix 3 of the Agreement. Additionally, the Wildlife Management Branch of ASRD has also expressed an interest to participate in the assessment.

**Overview of the Environmental Assessment Process**

Under subsection 5(1) of the CEAA, a federal environmental assessment may be required (“triggered”) when, in respect of a project, a federal authority:

- Is the proponent;
- Makes or authorizes payment or any other form of financial assistance to the proponent;
- Sells, leases or otherwise disposes of lands; or
- Issues a permit, or license or other form of approval pursuant to a statutory or regulatory provision referred to in the *Law List Regulations of the CEAA*.

In the case of the Project, a federal approval (permit) is required under the *Law List Regulations*, which triggers the need for a federal environmental assessment under CEAA. Section 3 of the *Wildlife Area Regulations* prohibits the carrying on of any commercial or industrial activity unless the activity is done under, and in accordance with, a permit issued by the Minister pursuant to Section 4. Section 4 of the *Wildlife
**Area Regulations** states that the Minister may, on application, issue a permit to any person authorizing that person to carry on an activity described in Section 3 provided that activity will not interfere with the conservation of wildlife. Therefore, EnCana requires a permit under Section 4 of the *Wildlife Area Regulations* to carry out the Project.

Pursuant to section 2(c) of the Comprehensive Study List Regulations, the Project is subject to a comprehensive study as the Project involves the construction of a gas pipeline in a wildlife area. The Minister of the Environment must determine the appropriate track for the Project (whether the environmental assessment should continue as a comprehensive study or whether the Project should be referred to mediation or a review panel).

To make the tracking decision, the following process is utilized. Firstly, In accordance with subsection 21(1) of the CEAA, DND must ensure that public consultation on the following issues is carried out prior to the tracking decision:

- the proposed scope of the project for the environmental assessment;
- the proposed factors to be considered in the environmental assessment;
- the proposed scope of those factors; and
- the ability of the comprehensive study to address issues relating to the project.

Secondly, pursuant to subsection 21(2) of the CEAA, the DND, as soon as it is of the opinion that it has sufficient information to do so, must submit a report to the Minister of the Environment, which includes the following:

- the scope of the project, the factors to be considered in the environmental assessment and the scope of those factors;
- public concerns in relation to the project;
- the ability of the comprehensive study process to address issues relating to the project; and
- the DND must also recommend whether the environmental assessment should be continued by means of a comprehensive study, or whether the project should be referred to a mediator or review panel.

After considering the report and recommendation, the Minister of the Environment must decide whether to refer the project back to the DND to continue with the comprehensive study process, or refer the project to a mediator or review panel. If the Minister of the Environment decides that the project should continue as a comprehensive study, the project cannot be referred to a mediator or review panel at a later date. Whether the environmental assessment proceeds by means of a comprehensive study or is referred to a review panel, participant funding will be made available by the Agency to facilitate public participation.

If after considering the report and recommendation, the Minister of the Environment refers the project to a mediator or review panel, the project will no longer be subject to a comprehensive study under the CEAA. The Minister of the Environment, after
consulting the DND and other appropriate parties, will set the terms of reference for the review, and appoint the mediator or review panel members.

If the Minister of the Environment determines that the environmental assessment will continue as a comprehensive study, an environmental assessment will be undertaken and a Comprehensive Study Report (CSR) will be prepared and submitted to the Minister of the Environment and to the Agency. The DND must ensure that there are opportunities for public participation during the comprehensive study process.

Following submission of the CSR, the Agency will invite the public to comment on the report prior to the Minister of the Environment making his determination. The Minister of the Environment may request additional information or require that public concerns be further addressed before issuing the environmental assessment decision statement. Once the environmental assessment decision statement is issued, the Minister of the Environment will refer the project back to the DND for action.

1.3.2 Other Federal Legislation, Regulations and Policies

CFB Suffield, including the NWA, is situated within federal lands. In addition to complying with relevant provincial requirements (see section 1.3.3 below), EnCana must comply with all relevant federal regulatory requirements. Applicable federal regulatory requirements include provisions under the Species at Risk Act, the Migratory Birds Convention Act, and the Fisheries Act. In addition, the Federal Policy on Wetland Conservation also applies.

Species at Risk Act

The Species at Risk Act (SARA) prohibits the killing, harming, harassment, capture or take of listed species and the destruction of their residence and critical habitat, except under the authority of a permit. The prohibitions apply to those species listed under the Act as Extirpated, Endangered or Threatened. The permitting authority rests with Environment Canada, Fisheries and Oceans Canada and Parks Canada, and cannot be delegated. Applicants for permits must meet specific criteria as outlined in the Act.

SARA also has requirements for notification of the competent Minister or Ministers. Section 79 of SARA states that:

1) **Every person who is required by or under an Act of Parliament to ensure that an assessment of the environmental effects of a project is conducted must, without delay, notify the competent minister or ministers in writing of the project if it is likely to affect a listed wildlife species or its critical habitat.**

2) **The person must identify the adverse effects of the project on the listed wildlife species and its critical habitat and, if the project is carried out, must ensure that measures are taken to avoid or lessen those effects and to monitor them. The measures must be taken in a way that is consistent with any applicable recovery strategy and action plans.**
Given the known occurrence of SARA listed species, as well as provincially listed species, and the ecological integrity of the mixed prairie found within the NWA, it will be necessary to identify the potential impacts to the biophysical environment and develop suitable mitigation measures during the environmental assessment. EnCana is committed to ensuring the environmental assessment process is carried out in accordance with the terms of reference to be developed. As the NWA is a wildlife area, EnCana understands that a greater level of detail will be required during the environmental assessment process.

**Migratory Birds Convention Act**

The regulations under the *Migratory Birds Convention Act* (*MBCA*) prohibit the disturbance, destruction or taking of a nest, egg or nest shelter of a migratory bird and the deposit of oil, oily wastes or any other substances harmful to migratory birds in any waters or any areas frequented by migratory birds. Migratory birds are known to occur and nest within the boundaries of the NWA; therefore, this will be a consideration in the development of mitigation measures.

**Fisheries Act**

Section 35 of the *Fisheries Act* is the key habitat protection provision that prohibits the harmful alteration, disruption or destruction (HADD) of fish habitat without an authorization from the Minister or through regulations under the Act. Additionally, Section 36(3) of the *Fisheries Act* identifies pollution prevention requirements. Specifically the Act states that: “no person shall deposit or permit the deposit of a deleterious substance of any type in water frequented by fish or in any place under any conditions where the deleterious substance or any deleterious substance that results from the deposit of the deleterious substance may enter any such water.” This provision would apply to portions of the project and project activities that border the South Saskatchewan River.

During this project, EnCana does not propose to construct any facilities, well sites or pipelines or bridges across or within the South Saskatchewan River or within any fish-bearing streams.

**Federal Policy on Wetland Conservation**

The proponent is expected to comply with the Federal Policy on Wetland Conservation by taking steps to avoid, minimize or remediate impacts to wetlands on CFB Suffield, including the NWA. Through this policy the Federal Government is expected to ensure a number of principles are followed, including no net loss of wetland functions on all federal lands and waters by reducing all the effects of development related to these wetlands, and enhancement and rehabilitation of wetlands in areas where there is continuing loss or degradation of wetlands or their function.

1.3.3 Provincial Regulatory Process

The Province of Alberta owns most of the subsurface rights in the NWA and has issued mineral leases to EnCana. In Alberta, energy activities are primarily regulated under the
Acts and Regulations administered by the EUB, AENV, and ASRD. As a result, all wells drilled, and pipelines installed, as part of the Project will be licensed by the EUB. Additionally, all drilling, completion, and tie-in practices are regulated by the EUB, as well as the ongoing operations of the wells.

EnCana will comply with the following EUB guidance as appropriate including: EUB Directive 056: Energy Development Applications and Schedules (formerly Guide 56: “Energy Development Applications and Schedules”). Directive 056 outlines the primary requirements for the pipeline and well licensing process. Section 6 and Schedule 3 of Directive 056 details the pipeline license application process, while Section 7 and Schedule 4 detail the well license application process. Directive 056 requires that all well sites located within the required 100 meter setback distance from well centre to a wetland must have the appropriate mitigation in place. Directive 056 also establishes rules regarding:

- emergency response planning;
- groundwater protection (based on Guide 8: Surface Casing Depth Minimum Requirements);
- setback requirements; and
- requirements for acceptable measures to protect the environment.

Several key EUB and AENV requirements, related to the project, are listed below:

- January 2002, Petroleum Industry Activity in Native Prairie and Parkland Areas Guidelines for Minimizing Surface Disturbance;
- EUB Guide 50: Drilling Waste Management;
- EUB Guide 58: Oilfield Waste Management Requirements for the Upstream Petroleum Industry;
- EUB IL 2002-01: “Principles for Minimizing Surface Disturbance in Native Prairie and Parkland Areas”;
- Alberta Environment R&R/03-2: “Siting an Upstream Oil and Gas Site in an Environmentally Sensitive Area on Private Land: Guidance for Private Land”; and,
- EUB: Recommended Land Use Guidelines for the Protection of Wildlife Species and Habitat within Grassland and Parkland Natural Regions of Alberta.

To ensure compliance with the numerous EUB Directives, Guidelines, Information Letters and provincial acts and Regulations, the EUB utilizes an auditing process. For example, within Directive 056, this auditing process is detailed in Section 6.10 and 7.10.
If an audit indicates that a company is not in compliance with Directive 56, then the EUB’s enforcement process, detailed in EUB IL 99-04, will be engaged.

To ensure compliance with all regulatory requirements and to ensure conformance with EnCana’s best practices (including the Environmental Protection Plan (EPP)) and other commitments made during the environmental assessment and approval process, EnCana will continue to implement its existing internal audit program during all phases of construction and throughout the life of the Project. In addition, EnCana is subject to periodic regulatory EUB/Alberta Environment audits. Additional information on these audit programs and the standards used in these programs will be provided in the environmental assessment report.

EnCana will develop a project specific EPP as part of the environmental assessment process. The EPP will include EnCana’s Access Management Plan. EnCana is committed to ensure its development program includes appropriate measures to effectively identify, monitor, and adaptively manage any effects of the Project.

EnCana proposes to continue to withdraw water from the South Saskatchewan River and dugouts and water wells to meet the water requirements of the Project. The new sources of water will be licensed by Alberta Environment. Alberta Environment typically requires that EnCana appropriately screen water intake pipes and limit the velocity of flow at intake.

1.4 PUBLIC CONSULTATIONS

Throughout the course of the environmental assessment, there will be a number of opportunities for public involvement. In the initial stage, pursuant to subsection 21(1) of the CEAA, the DND will ensure public consultation is carried out with respect to:

- the proposed scope of the project for the purposes of the environmental assessment;
- the factors proposed to be considered in its assessment;
- the proposed scope of those factors; and
- the ability of the comprehensive study to address issues relating to the project.

Pursuant to section 21.2 of the CEAA, the DND will also ensure that the public is provided with an opportunity to participate in the comprehensive study. Pursuant to subsection 22(1) of the CEAA, after receiving the comprehensive study report in respect of the Project, the Agency will ensure that the public has an opportunity to comment on the conclusions, recommendations and any other aspect of the comprehensive study report.

As the project proceeds through the environmental assessment process, EnCana will initiate and conduct consultations with external stakeholders as appropriate in cooperation with the Agency and the DND so as to facilitate meaningful public
participation. EnCana will conduct open houses during the environmental assessment to ensure that the public is aware of all aspects of the Project.

2.0 PROJECT DESCRIPTION

The proposed Project encompasses all of the anticipated future infill locations that will be required to adequately recover the shallow gas reserves within the NWA. It is expected that a maximum of 16 wells per section (wps) will be required in several areas of the NWA to adequately capture the gas in place. Up to 1275 new infill wells may be required at various locations throughout the NWA. The Project does not involve additional drilling activities on existing wells. The proposed locations with some contingent well locations are shown in Map 3 of Appendix A. The exact locations may vary when actually surveyed due to mitigation measures related to terrain or other factors. The Project will employ the low impact development techniques described above under section 1.1.4, and for which a more detailed description will be provided in the environmental assessment report. Mitigation techniques will also be incorporated into the Project’s EPP.

The project schedule envisioned for construction activities is to work between the lockout periods such as the military imposed lock out, the snake migration and migratory birds and their breeding periods. Generally, the lock out period is from mid-March to mid-October depending on the species involved and weather constraints. For example, the snake migration lock out period is typically from May to October. The Burrowing Owl lock out period is typically from early April to mid-October.

It is currently envisioned that the development will commence at the south end of the NWA during the first year with subsequent phases in the middle and northern portions of the NWA in subsequent years. Further, it is anticipated that only four (4) to five (5) drilling rigs will be required at any given time during drilling, and such rigs will use low impact technology. A drilling rig move requires approximately five (5) loads to move with bed trucks, one drilling rig, water truck and vacuum truck. It is anticipated that a maximum two (2) to four (4) completions crews and two (2) to (3) tie-in crews will be active in the NWA at any one time. A fracturing operation typically requires 10 to 15 trucks on location. This anticipated project schedule may be modified based upon the outcome of the environmental assessment process.

Associated with these wells are approximately one hundred and eighty (180) kilometers of two (2) inch (50.8 millimeter) high-density polyethylene plastic pipe (“HDPE”) to tie the wells into an existing pipeline. All two (2) inch (50.8 millimeter) pipelines will be constructed using minimal disturbance plowing techniques. The project scope also includes the installation of approximately forty (40) kilometers of six (6) or eight (8) inch (152.4 to 203.2 millimeter) steel pipe to effectively transport the gas to the compressor stations located outside of the NWA. EnCana proposes to install six (6) and eight (8) inch steel pipelines using conventional ditching techniques (e.g. wheel ditcher). Conventional ditching techniques will also be utilized to install two (2) inch HDPE pipe in the limited areas where plowing is not possible due to rocky terrain. Applicable pipeline
installation techniques will be evaluated during the environmental assessment process and will be discussed in the EPP.

The only above ground facilities envisioned for the Project in the NWA (outside of the wellheads) will be pig catchers and gas meters. Additional above ground gas meters and pig catchers for each gas battery will be installed if a back end tie-in loop is required for that battery. Pigging facilities (catchers and launchers) may be required for the additional pipelines associated with the Project. At 16 WPS density, gas batteries can service between 96 and 128 wells. There is an existing buried water separation facility located at 16-23-17-5W4M, outside of the NWA, which the Project facilities will access.

Additional sumps may be required outside of the NWA if drilling occurs during the times when land spraying while drilling (LWD) is not possible. LWD is generally a preferred method as it returns the water to the water system while providing additional nutrients to the soil. It is not anticipated that additional water disposal wells will be required. Existing water disposal wells are located on CFB Suffield, outside of the NWA.

All compressor facilities are located outside the NWA. It will not be necessary to construct any new compressor facilities for the project as there is currently enough compression installed on the existing system to produce the additional NWA wells. As the reservoir pressure depletes, compression will have to be modified at existing locations outside the NWA to accommodate the changes in gathering system pressure and flow rates to optimize recovery of natural gas.

During the life of a reservoir, the pressure is reduced and adjustments to compression are required. This normal maintenance practice is used to maximize the recovery from the reservoir and will be carried out regardless of reservoir location, and is independent of the NWA infill drilling project.

2.1 PROJECT ACTIVITIES

It is anticipated that the majority of preparation activities will occur from spring to fall to ensure that activities are appropriately located based on the identification of environmental constraints. During each year of the three year program, drilling will commence in the late fall and continue through the winter (October to April). EnCana's current plan is to drill between 300 and 400 wells each year for three years. Completion activities will also be carried out in late fall and winter (October to April). Well tie in activity will either occur during this same time period or during dry conditions throughout the year. This preliminary schedule is designed to avoid conflicts with species at risk (including rare plants). Environmental assessments (including field work) and pre-planning work will be completed during the summer to ensure all activities and facilities are appropriately located. This anticipated project schedule may be modified based upon the outcome of the environmental assessment process. Further, it is anticipated that between two and four drilling rigs will be required at any given time during drilling, and that such rigs will use low impact technology.
2.1.1 Preparation Phase

Several steps occur prior to the construction of the project. One of the key steps is the initial planning activities associated with the identification of potential project locations, pipeline routing and identification of access routes.

EnCana also utilizes its constraint mapping tool to:

- supplement preliminary desktop information that is gathered from other database sources (e.g., provincial databases)
- select preliminary routing
- identify potential locations for well sites and their associated tie-ins, and
- determine preliminary access routes.

The constraints mapping tool consists of an environmental database that is gathered from different provincial and federal sources, as well as information gathered during desktop studies or additional fieldwork collected for other EnCana projects at CFB Suffield. This process allows a screening level desktop assessment and is followed by a planning meeting prior to going to the field.

Once the preliminary locations are chosen and the potential environmental issues are identified, a field crew consisting of environmental specialists (e.g. wildlife, archeologists, botanists, etc.), surveyors and construction staff will go to each of the locations to ensure that the location is sited in the optimum location prior to construction taking place. This process also reduces the number of visits and the number of crews visiting each of the sites. Mitigation is developed for any potential issues identified in the field, at each location, prior to construction taking place.

Also during the preparation phase, Suffield Industry Range Control (“SIRC”) will conduct a site sweep for unexploded ordinance prior to any activity taking place in the field.

2.1.2 Construction Phase

There are three main elements of the Project's construction phase: (1) drilling; (2) completions; and (3) tie-in of new wells into the existing gathering system via HDPE pipelines. It is anticipated that all of the wells proposed will be drilled, completed and tied-in during a three (3) year period. The largest activity phase of the project is the initial drilling, completion and tie-in of the wells.

2.1.2.1 Drilling

As mentioned in the preparation phase, the location of the well or pipeline ROW may be adjusted as necessary to accommodate terrain, wildlife, and other environmental concerns. A project specific EPP is developed for all EnCana projects. It is important to note that an EPP will be developed for this Project for all phases of construction based on the issues identified during the environmental assessment process to ensure
implementation of the follow up and monitoring required and to implement an adaptive management approach to the development.

After the drilling location is finalized, access to the well site is determined and marked. To minimize the disturbance to the prairie environment, roads are not constructed to the locations. An access route is marked to allow all traffic to follow only one path to the well site thus avoiding multiple paths to the location. Whenever possible, EnCana will use existing access in the NWA. EnCana will be developing an access management plan as part of the environmental assessment of the Project.

All wells will be drilled using minimal disturbance techniques to minimize soil disturbance, preserve the soil regime and maintain the existing seed bed. Typically, no topsoil is removed on the lease during drilling; with the only disturbance being the wellhead itself. These minimal disturbance techniques will be described as part of the environmental assessment process.

To drill the well, a small conductor rig is moved in. The conductor rig drills until a seven (7) inch (177.8 millimeter) conductor pipe can be cemented in place at approximately 27 meters. After the conductor pipe has been set, the drilling rig and associated equipment will move onto the lease (approximately five (5) truck loads). The drilling rigs used to drill the shallow gas wells will be either “single rigs” or coil tubing rigs, which have a continuous coil of 2 3/8 inch (60.3 millimeter) tubing that serves as the drill pipe. Such rigs are much smaller than conventional deeper well rigs and cause significantly less disturbances to the area due to the low impact technology used. It takes 14 to 20 hours to drill each well to the total depth of 450 to 650 meters depending on location. A string of 4.5 inch (114.3 millimeter) casing is then run in the total length of the hole and cemented in place. All drill cuttings and drilling fluid (water) are collected into onsite tanks while drilling, and removed from the NWA for disposal according to EnCana’s Waste Disposal Policy and provincial regulations. Lastly, the wellhead is installed.

2.1.2.2 Completions

The completions stage follows drilling and allows the gas encountered during drilling to be produced.

After the well is drilled, the following steps are taken to complete the well:

1. a well logging truck and crew run an electronic well log from the total depth to surface;
2. the well is pressure tested to ensure casing integrity;
3. a swabbing unit, typically a five (5) ton truck, removes the water that is in the wellbore and collects it in a truck mounted tank for disposal outside the NWA;
4. a perforating unit places perforations in the casing at the appropriate depths as determined by an interpretation of the well log;
5. a blowback tank (truck mounted tank) is placed on location for the duration of the fracturing;

6. the well is fracture stimulated. This activity pumps sand and a gelled water/CO$_2$ fluid mixture down the wellbore at high pressure. The pressure forces the formations downhole to fracture and the sand fills these fractures. This operation allows the wells to flow at commercial rates. The fracturing operation requires 10 to 15 trucks on location and typically takes four (4) to six (6) hours.

7. the well is flowed back to the blowback tank to remove as much of the water that was used in the “frac” process as possible. Included in the water that is flowed back, there are typically small amounts of sand. The recovered fluid and sand are contained in the blowback tanks are taken off site, out of the NWA, and recycled.

8. using a small coil tubing unit, the well is cleaned out to remove any more fluid; and,

9. the well is shut-in until it is tied into the gathering system.

2.1.2.3 Well Tie-ins

The wells will be tied into the existing or new gathering system using two (2) inch (50.8 millimeter) HDPE pipe. All HDPE pipelines will be buried using low impact plowing equipment. The HDPE pipe is a continuous pipe brought to location on a large roll. Using specialized plowing equipment the roll of pipe is plowed into the ground at a depth of 1.5 meters (five (5) feet). This technique results in minimal disturbance to the ground. In addition, the width of the pipeline ROW is kept as narrow as possible. The total pipeline length used will depend on the proximity of the existing gathering system to the wellbore. Lengths of tie-ins are typically between 200 and 400 meters. Once the well is tied in, the well is brought onstream.

In certain areas four (4) to eight (8) inch (101.3 to 203.2 millimeter) diameter steel pipelines may be required to allow for effective transport of the gas to an existing gathering system. These pipelines are expected to average three (3) to six (6) km in length and will be installed using conventional ditching techniques. Potential areas requiring conventional ditching techniques will be identified during the environmental assessment.

Once the pipeline is ditched, either using conventional ditching techniques (i.e. steel) or low impact ploughing equipment (i.e. HDPE pipe), post construction reclamation activities will take place. Post construction and clean-up activities include re-contouring (if required), re-seeding and post construction monitoring. Post construction and clean-up and monitoring activities associated with conventional ditching methods and low impact ploughing will be evaluated and discussed in further detail in the environmental assessment and in the EPP.

If bell holes are required (e.g. road crossings) topsoil and subsoil are stripped and stored separately in the immediate area. Once construction is complete, the bell holes
are immediately backfilled using native subsoil and topsoil. The site is then recontoured and reseeded. This process also will be discussed in further detail in the environmental assessment and in the EPP.

2.1.2.4 Post construction and clean-up activities

Post construction and clean-up activities associated with the wells and pipelines will be evaluated in both the environmental assessment and in consultation with the DND. The environmental assessment will determine the requirements for actions such as exclusion fencing, weed control and erosion control measures.

It is anticipated that, for the proposed Project in the NWA, no borrow pits for gravel will be required for any construction remediation, reclamation, operational, decommissioning or abandonment activities during the lifetime of the Project. Since existing access will be utilized for the Project, no roads will be built for this Project, therefore, the use of gravel (and construction, maintenance and reclamation) from borrow pits in the NWA will not be necessary. In the unlikely event that gravel may be required to improve the road conditions, gravel could be brought in from outside the NWA – but this activity is not anticipated to be required.

Additional soil (from a borrow pit or stockpile) may be required for reclamation of ROWs, lease areas and access roads during the reclamation, remediation maintenance or abandonment processes. It is important to note that well leases and pipeline ROWs will be constructed using minimal disturbance and no-strip techniques therefore, it is not anticipated that any additional fill or soil material will be required.

2.1.3 Operations Phase

The main activities conducted in the operations phase are:

1. Well testing – Wells are regularly required to be stabilized and evaluated. Well site visits average one visit per month in the first year of production. These visits would involve the use of a three quarter ton truck and typically one truck would visit approximately 15 to 20 wells in a day. For future years, a yearly test of the well’s performance is required as per EUB regulations.

2. Swabbing - Well site visits after the first year of production would average one visit per year if no water is produced in the well bore. In the event that water is produced at any time in the wellbore, well site visits would average four visits per year. If there were water produced then well site visits would involve the use of a swabbing unit and tank truck or a coil tubing unit and blowback tank. The water that has produced into the wellbore would be removed. All water that is “swabbed” out of the wells would be contained in a tank truck and disposed of outside the NWA. It is not expected that the management of produced water will require any additional infrastructure such as permanent tanks, berms or methanol tanks.
3. Refracture – For some wells it may be necessary to refracture the producing formation. This activity is essentially a repeat of the completion process described above. A refracture is not typically required, but if required, would take place 15 to 25 years after the initial completion.

4. Well Inspections and Pipeline Integrity Checks - On a yearly basis the pipelines and wellheads are inspected for leaks and/or damage. Any leaks detected would be immediately repaired pursuant to EUB regulations. Additionally, EnCana periodically monitors its pipeline ROWs during the operational phase. While performing their operational activities, operators, trained to identify such issues, also check for issues such as subsidence, erosion and weeds.

As road and lease conditions are one of the primary factors for planning and scheduling operational activities, EnCana’s practice is to defer operational site visits and construction activities when conditions are excessively wet. The intent of this practice is to prevent the rutting of lease sites and undeveloped lease access routes.

2.1.3.1 Air Emissions Profile

The potential sources of air emissions associated with this Project include: vehicles (exhaust and dust); completion clean-up (short term venting); swabbing operations (tank vent gasses) and fugitive emissions. The extent and impact of air emissions associated with the Project will be detailed in the Environmental Assessment Report.

2.1.4 Decommissioning and Abandonment

It is expected that ongoing operations and subsequent abandonment of the wells and pipelines will occur over the next 20 to 40 years. Decommissioning and abandonment of both production and pipeline facilities will be undertaken at the end of the wells’ life in accordance with the regulatory requirements applicable at the time of such activities. Although regulatory requirements may change prior to the time of abandonment, current practices would see the wellbores plugged back with cement and bridge plugs and the wellhead removed below grade and buried. The leases will be reclaimed using appropriate seed mixes determined after consultation with the DND, EC and AENV. The pipelines will be filled with inhibited fluid, cut off below grade and abandoned in place. The Environmental Assessment Report will consider alternatives means of decommissioning and abandoning the facilities associated with the Project.

Under the Alberta Environmental Protection and Enhancement Act (“AEPEA”), operators are required to employ effective conservation and reclamation measures and to ensure that the disturbed land is reclaimed to meet the goal of equivalent land capability. Equivalent land capability means that the ability of the land to support various land uses after conservation and reclamation is similar to the ability that existed prior to an activity being conducted on the land.
2.2  **PROJECT SCHEDULE**

The project schedule envisioned for the Project is to work around environmental constraints such as the snake migration and migratory birds breeding periods. The project schedule is designed to avoid conflicts where possible with species at risk (including rare plants). The environmental constraints are primarily in the summer months thus drilling and completions will occur in the late fall and continue through the winter (October to April) with well tie in activity happening in either this same time period or during dry conditions throughout the year. Environmental overviews and pre-planning work will be completed from spring to fall to ensure activities are appropriately located. The project schedule may be modified based upon the outcome of the environmental assessment process.

Table 1, below, provides examples of types of environmental constraints that will be considered in determining the appropriate timing for activities:

Table 1: Environmental Constraints

<table>
<thead>
<tr>
<th>ISSUE</th>
<th>CONSTRAINTS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Wildlife:</strong></td>
<td></td>
</tr>
<tr>
<td>Birds</td>
<td>Migratory species returning to breeding grounds (spring) and overwintering grounds (fall); seasonal breeding activities (e.g. leks in spring and in fall); nesting activities (e.g. multiple broods); different activities for rearing young or different lifecycle requirements (e.g. roosting areas may be different than feeding areas for Burrowing Owls)</td>
</tr>
<tr>
<td>Mammals</td>
<td>Seasonal requirements during winter range (e.g. winter activity and hibernation requirements for Ord’s Kangaroo Rats; seasonal yarding requirements for ungulates, etc.) and other timing/seasonal constraints associated with breeding periods, having young and rearing (e.g. ungulates rearing young verses calving grounds, Swift Fox denning, etc.)</td>
</tr>
<tr>
<td>Reptiles and Amphibians</td>
<td>Migration or seasonal travel to hibernacula/spawning and breeding grounds; moisture/ ecological requirements for amphibians for breeding, hibernation (e.g., great plains toads; prairie rattlesnake)</td>
</tr>
<tr>
<td>Rare plants</td>
<td>Timing of annual vs. bi-annual flowering species; and early vs. late flowering plants</td>
</tr>
<tr>
<td>Wet areas /wetlands /South Saskatchewan River</td>
<td>Migratory, breeding or seasonal utilization of the wet areas depending on type of water.</td>
</tr>
</tbody>
</table>
2.3  WASTE DISPOSAL / WATER USE AND DISPOSAL

EnCana will follow its Waste Disposal Policy and ensure that all produced water and associated waste products are disposed of in accordance with provincial and federal requirements. The most common waste product is produced water; however, all waste will be dealt with as is appropriate. The exact procedures to be utilized for this Project will be determined during the environmental assessment process.

2.3.1 Water Required For Drilling & Drilling Products

Each well requires approximately 70m$^3$ of water to be used. The water necessary for drilling is transported to the drill-site via a truck-mounted tank. Approximately 80 percent, or 56m$^3$, of the water used to drill a well is captured. This 56m$^3$ of water, captured during the drilling process, is either returned to the water system via land spraying ("LWD") or via disposal in sumps located outside the NWA.

Regardless of whether an LWD process or sump disposal method is used, a water recycling process is employed. Where an LWD process is used approximately 12m$^3$ of water is captured via the recycling process and is used to drill the next well in the program. This process decreases the “new” water requirement for the “next well” to 58m$^3$. Where LWD is not employed, water recovered from the drilling process is recycled until it becomes too dense for use in the next well. The recycling process associated with sump disposal allows approximately 25m$^3$ of water from each well to be re-used.

Currently, whether LWD on CFB Suffield is allowed is determined, on a yearly basis, by the AEUB. At this time, LWD is not permitted inside of the NWA. The drilling cuttings and fluids from the drilling of NWA wells are contained in tanks and disposed of outside the NWA using LWD or remote sumps.

2.3.2 Water Usage for Completions

Based on previous operations in the NWA, each well will require 110 m$^3$ of fluid for well completions of which approximately 40% is recovered. The recovered water is transferred to a remote sump where fluid and solids are separated. During summer operations, the fluid is reused as a drilling fluid and the solids are sent to a provincially approved reclamation site. In the winter, all fluid is sent to a water disposal well and the solids are sent to a provincially approved reclamation site.
2.4 MALFUNCTIONS AND ACCIDENTS

EnCana has an emergency response plan ("ERP") in place in the event of an accident, malfunction or well blow out. This ERP includes plans pertaining to both the initial construction phase as well as the ongoing operational phase.

In addition, EnCana inspects all wellheads and pipelines on an annual basis. As required by EnCana procedures, any leaks detected at the wellheads or along the pipeline right of ways are repaired immediately.

3.0 ENVIRONMENTAL SETTING

The NWA encompasses 458 km$^2$ of prairie grassland blanketing landscapes including sand hills, ancient glacial coulees, and the riverbank and breaks along the South Saskatchewan River valley. The western portion of the base is found in the Rainy Hills Upland physiographic district; comprised of hummocky and undulating moraine materials. The eastern portion of the base is found in the Cavendish Plain district. This area is comprised of undulating, rapidly draining glaciofluvial deposits. The Schuler Upland district is found immediately adjacent to the South Saskatchewan River in the southeast corner of the base; this area is comprised of hummocky and undulating till deposits (Pettapiece, 1986). The NWA is the most topographically diverse area of the Suffield Block. This is attributed to the sand hills area, the melt water channels or depressions, numerous ravines and highlands, and the South Saskatchewan River valley. From an ecological perspective, the area is found within the Dry Mixedgrass Subregion of the Grasslands Natural Region of Alberta (Alberta Environmental Protection, 1998). [Modal sites within this sub-region are characterized by spear grass – blue grama grass (Stipa spp. – Bouteloua gracilis) on Brown Chernozemic soils (Strong and Leggatt, 1992). The \"A\" horizon is on the average 10 centimeter thick, with two (2) to three (3) percent organic matter (Pettapiece and Kjearsgaard, 1986).

The landscape within the NWA is dominated by 3 broad physiographic units, the Eastern Alberta Uplands, the Eastern Alberta Plain, and the South Saskatchewan River Valley (Pettapiece 1986 and Strong 1992). The terrain associated with the Eastern Alberta Uplands is regionally characterized as hummocky to rolling. Locally, surface relief is generally limited to a maximum of 30 m but more typically is 10 m. This physiographic unit is the second most common landscape in southern Alberta and represents approximately one quarter of the land within the Dry Mixed Grass Ecoregion. The Eastern Alberta Plain tends to have relatively level- to-undulating topography and occurs only in the southern one-fifth of the study area. The South Saskatchewan River Valley occurs along most of the eastern side of the study area. This physiographic unit includes steep-sided, often poorly vegetated, valley walls; discontinuous terraces that range from current-to-early, post-glacial age; and the present day South Saskatchewan River. Relief within the valley ranges up to about 150 m.

The origin of the surficial deposits on upland sites in the study area tends to be complex. Based on maps prepared by Berg and McPherson (1972) and Shetsen
(1987), air-photo interpretation and field observations, the uplands of the study area appear to be dominated by surficial materials derived from glacio-fluvial and eolian deposition and erosion processes, and moraine deposited by glacial ice (Adams et al. 1997).

Morainal deposits probably once covered the entire study area, but currently are limited to elevations above 700 m in the southern half of the study area. These materials tend to have a surface texture ranging from sandy loam to loam, with a loam-to-clay loam subsurface texture. It appears that during deglaciation and after the deposition of moraine, a layer of sandy textured materials was deposited over low elevational lands. This material and the water that transported it probably originated from the disintegration of stagnant glacial ice located to the west and northwest of the study area. The pre-existing morainal plain was partially eroded both before and during the deposition of outwash (Adams et al. 1997).

The zonal soils of the Dry Mixed Grass Ecoregion are Brown Chernozems. These soils typically develop in semi-arid steppe environments. Two broad types of soils dominate upland sites in the NWA: Orthic and Calcareous Brown Chernozems, and Orthic Regosol subgroups.

The vegetation cover of the NWA consists of 28 types representing 29 plant community-types recognized to date (Adams et al. 1997). The 28 cover types occur within 4 broad types of vegetation: grassland, wetlands, deciduous shrub and deciduous trees. The area of these types varies significantly between the North and South blocks of the NWA; the former supporting a greater proportion of woody vegetation compared with the South Block, which has more extensive tracts of herbaceous-dominated grassland. The proportion of woody cover in the vegetation correlates with the occurrence of sandy parent material and, similarly, with the protected slopes of ravine and dune complexes.

Grasslands are the dominant cover over the entire NWA. Wetlands and tree-dominated landscapes comprise less than 1% of the NWA, shrub dominant landscapes comprise less than 13%, shrub-grasslands: 14%, grassland-shrubs: 32%, grasslands: 38%, and barren areas: 2%.

Ten comprehensive reports documenting ecological land classes and vegetation cover, vascular plant flora, wetlands, ungulates, birds, small mammals, raptors, herpetiles, carnivores, and arthropods were prepared during the mid 1990s (Adams et al. 1997, Macdonald 1997, Adams et al. 1998, Banasch and Barry 1998, Dale et al. 1999, Didik 1999, Finnamore and Buckle 1999, Carbyn et al. 1999, and Reynolds et al. 1999.) The wildlife inventory was carried out to support management of the proposed NWA and to provide a baseline for evaluating the environment.

The grasslands, sand hills, river breaks and wetlands are habitat to a number of plants, mammals, birds, reptiles, amphibians and insects currently exceeding 1,100 known species, 14 of which are listed in the Species at Risk Act; Schedule 1. Examples of species at risk include the Swift Fox, Ord’s Kangaroo Rat and the Burrowing Owl. In
addition, 78 species of animals and plants that are listed by the Status of Alberta Wildlife 2000 as “at risk” or “sensitive” because of their declining abundance, occur in the NWA.

4.0 REQUIREMENTS RELATED TO FISH AND WATERWAYS

4.1 ENVIRONMENTAL FEATURES

The South Saskatchewan River provides the westernmost boundary of the NWA (see Map 1). Typical landscape forms such as sand hills, ancient glacial coulees, and the riverbank and breaks are found along and within the South Saskatchewan River (“SSR”) valley.

Under the Fisheries Act, R.S. 1985, c. F-14, Section 35 is the key habitat protection provision that prohibits the harmful alteration, disruption or destruction (“HADD”) of fish habitat without an authorization from the Minister or through regulations under the Act. During this Project, EnCana does not propose to construct any facilities, well sites or pipelines across or within the South Saskatchewan River or within any fish-bearing streams. It is therefore anticipated that a HADD permit will not be required.

EnCana will withdraw water from the SSR to meet the water requirements of the Project. Such water withdrawals are licensed by Alberta Environment. Alberta Environment typically requires that EnCana appropriately screen water intake pipes and limit the velocity of flow at intake.

Navigable Waters Protection Program ensures “the protection of the public right to navigation and the protection of the environment through the administration of the Navigable Waters Protection Act, R.S. 1985, c. N-22, (“NWPA”). It is anticipated that there will be no temporary bridges required across any water crossings or navigable waters during this Project. Therefore, an approval or permit under the NWPA will not be required.

Throughout the NWA, the landscape is dotted with many small depressional areas. These areas provide important habitat for migratory and breeding birds and provide important habitat and breeding grounds for many species of wildlife. Different classifications of wetlands are also found throughout the NWA. In general, wetlands are more frequently found in the southern part of the NWA (the Riverbank area, and the National Wildlife Area) than in the northern portion of the NWA (Middle Sand Hills).

EUB Directive 056 requires that all well sites located within the required 100 meter setback distance from well centre to a wetland must have the appropriate mitigation measures in place. In situations where the need to construct within the required 100 meter setback is unavoidable, EnCana has developed criteria by which to identify, locate, and construct well sites. It is anticipated that EnCana will avoid constructing within wetlands. In addition, EnCana consults with Alberta Sustainable Resource
Development ("ASRD") to ensure that issues with both the pipelines and wetlands have the appropriate mitigation measures in place prior to construction.

Given that the locations are preliminary at this stage, it is currently anticipated, at this time, that all of the water crossings will be non-fish bearing. In the unlikely event that EnCana must construct through a fish-bearing water course crossing, EnCana will conduct the appropriate Federal and Provincial regulatory consultation and obtain appropriate regulatory approvals prior to construction and appropriate mitigation measures will be developed as part of the environmental assessment.

Where practical, EnCana intends to avoid locating well sites, access roads and pipelines within 100 meters of a water crossing including wetlands. In the event that the location must be within 100 meters from well centre, EnCana will implement the appropriate mitigation such as buffer zones. Mitigation measures will be identified in the environmental assessment process and included in the EPP.

4.2 WATER SOURCES

The potential water sources on CFB Suffield include:

**Water source wells and dugouts**

- 12-6-17-5 W4 (20,000m³/yr licensed)
- 4-4-16-6 W4 (73,000m³/yr licensed)
- 5-2-20-7 well & dugout
- 10-16-20-7 well & dugout
- 9-16-20-7 well & dugout
- 10-16-20-8 well & dugout

**South Saskatchewan River water withdrawals (in the NWA)**

- NE 23-17-5 W4 (Temporary license for 12,480m³)

**Water sources off the base**

- Local dugouts from local area farmers

No wetlands will be used as water sources for the Project. The amount of water required from each source will be determined based on the number of wells drilled and locations of the wells.
Figure 1: Routine license application process

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