

## **Pylypow Regional Stormwater Management and Constructed Wetland Facility Environmental Screening Report**

### ***EXECUTIVE SUMMARY\****

#### ***Introduction***

The Pylypow Regional Stormwater Management and Constructed Wetland Facility (Pylypow Regional Facility) project consists of construction of a regional, off-stream, naturalized stormwater management facility located adjacent to Fulton Creek in southeast Edmonton. The facility would be situated west of 34<sup>th</sup> Street, approximately 1 km north of Whitemud Drive, adjacent and linked to a reach of Fulton Creek and approximately 1 km upstream of the Argyll Tunnel (Figure 1). The majority of the proposed project would occur on agricultural land located to the south of Fulton Creek, however, a portion of the project would occur within Fulton Creek itself and, as a result, overlaps with the North Saskatchewan River Valley Area Redevelopment Plan (NSRV ARP; City Bylaw 7188). In this location, Fulton Creek Ravine is also recognized as City of Edmonton Natural Area SE 5094, or, Fulton Creek Natural Area and is designated as Environmental Reserve. Although the Natural Area boundaries are not identical to the NSRV ARP boundaries (the Natural Area is larger and includes a wooded area that extends beyond the ravine edge), for the purpose of this ESR, we treat Fulton Creek Natural Area as synonymous with the reach of creek that is contained within the NSRV ARP boundary. Because of the work proposed within Plan boundaries, the project triggers an environmental assessment pursuant to the NSRV ARP. Through consultation during the early preliminary design stage, Planning and Development staff determined that an Environmental Screening Report (ESR) would be the appropriate level of review for this project. This document represents that ESR and focuses on those project components situated within the Natural Area.

#### ***Project Justification, Purpose and Alternatives Considered***

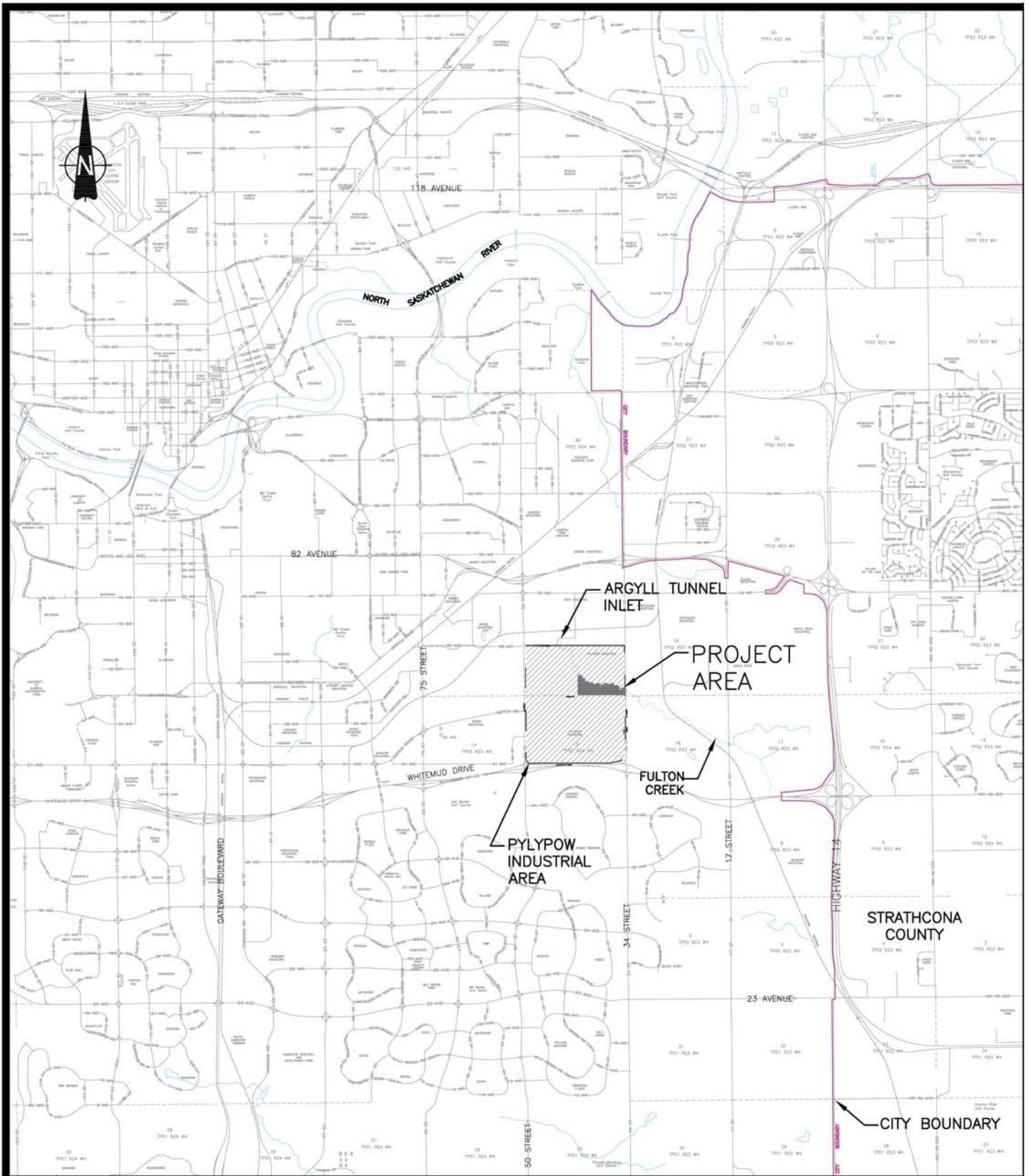
Beginning in 1994, several planning studies investigating flooding in the Fulton/Mill Creek basin identified the need to mitigate the existing flood risk by controlling runoff from existing and future developments in the Fulton Creek basin. The channel capacity of Fulton Creek, in its current condition, is inadequate to handle flows during a major storm event. As a result, both 17<sup>th</sup> Street and 34<sup>th</sup> Street are at risk of being overtopped in a major storm event. Peak flows in Fulton Creek also exceed the capacity of the inlet section to the Argyll Tunnel and could result in some flooding of the adjacent industrial area.

In 2004, the City purchased a parcel of land and began planning a facility that would accomplish the flood mitigation objectives. The end result was the proposed Pylypow Regional Facility, planned as a critical off-stream storage and treatment facility for the Fulton Creek basin. Initial conceptual-level planning for the Pylypow Regional Facility

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\* The executive summary may require editing to reflect comments that have yet to be received from the City's review of the Environmental Screening Report

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### PYLOPOW REGIONAL WETLAND

### PROJECT LOCATION



FIGURE 1

included as many as six options, each of which required the construction of a diversion structure and an outfall structure within Fulton Creek. At a VE Session held in March 2007, two options were carried forward to a second VE session and to pre-design, the two differing only with respect to location of the outfall to Fulton Creek: one option required a short outfall pipe, the other a significantly longer outfall pipe. Both pipes would be constructed through a portion of the Fulton Creek Natural Area and would require either clearing or an easement for long-term maintenance. At a second VE session in July 2007, it was decided that the larger environmental impact and the greater costs associated with the ‘long outfall’ option outweighed the advantages of its additional stormwater storage. The preferred option was thus selected to be the ‘short outfall’ option, thereby minimizing the area of existing forest that would be disturbed as a result of construction.

***Project Objectives***

The primary objectives of the Pylypow Regional Facility are to:

- provide storage to control peak flows into the Argyll Tunnel,
- reduce flooding of the Argyll Tunnel and Mill Creek,
- reduce flooding along Fulton Creek and throughout adjacent lands,
- control flows from industrial areas that were previously developed without stormwater management,
- improve the quality of runoff from lands within the Fulton Creek basin, and
- maintain some riparian flows along Fulton Creek.

***Project Description***

The Pylypow Regional Facility is designed to provide approximately 150,000 m<sup>3</sup> of stormwater storage volume and to function as a constructed wetland that would improve creek water quality and provide compensatory wetland habitat. The proposed project would include the following components (Table 1): a diversion berm; an inlet (diversion) channel; a sediment forebay; a riparian low flow control structure; an interconnection pipe, an overflow channel; the main pond/ constructed wetland; an outlet control structure; and naturalized landscaping, including trails and viewing platforms (Figure 2). Including all components, the facility would measure approximately 9.8 ha in size.

**Table 1. Components of the Pylypow Regional Facility and their function(s)**

<b>Project Component</b>	<b>Function(s)</b>
Diversion berm	<ul style="list-style-type: none"> <li>• block the flow of water along the existing creek channel</li> </ul>
Inlet (diversion) channel	<ul style="list-style-type: none"> <li>• direct water from the existing creek channel into the sediment forebay</li> </ul>
Sediment forebay	<ul style="list-style-type: none"> <li>• temporarily retain water to provide for the initial settling out of suspended sediments</li> </ul>

Riparian low flow control structure	<ul style="list-style-type: none"> <li>• direct some flows back into the creek immediately downstream of the diversion berm to maintain a base level of water flowing through the creek</li> </ul>
Interconnection pipe	<ul style="list-style-type: none"> <li>• convey the majority of diverted water from the forebay into the main pond</li> </ul>
Main pond/ constructed wetland	<ul style="list-style-type: none"> <li>• provide the majority of the facility's overall storage capacity</li> <li>• promote further settling out of suspended sediments and the uptake of contaminants and nutrients</li> <li>• provide naturalized wetland habitat for a diversity of wildlife species</li> </ul>
Outlet control structure	<ul style="list-style-type: none"> <li>• control the release of water from the main pond into creek (the control structure would release water at a maximum rate in accordance with previously identified pre-development flow rates for the basin)</li> </ul>
Naturalized landscaping	<ul style="list-style-type: none"> <li>• provide added wildlife and aesthetic value to the areas surrounding the facility</li> <li>• provide nature appreciation and other passive recreation opportunities</li> </ul>

The main pond would be surrounded by a berm to accommodate the maximum storage capacity of approximately 150,000 m<sup>3</sup>. The pond would include three deep pools to promote the settling out of suspended sediments. Shallow areas around the perimeter of the pond would be lined with native wetland soils and planted with native wetland species to promote the establishment of an emergent plant community that would provide further water treatment and wetland habitat for a diversity of wildlife species. To eliminate the current flood risk, the combined flow rates from the outlet control structure and the riparian low flow structure would remain below the existing capacity of the Argyll Tunnel inlet.

### ***Project Construction***

The construction of the Pylypow Regional Facility, as a whole, would include (in chronological order) site preparation (i.e., surveying, vegetation clearing and soil stripping); excavation of the main pond and forebay; construction of control and outfall structures; landscaping; and construction of the diversion berm and the inlet (diversion) channel. To ensure compliance with the Alberta *Wildlife Act* and the federal *Migratory Birds Convention Act*, vegetation clearing would be conducted outside the period of 15 April to 31 July. Following vegetation clearing, topsoil would be stripped and stockpiled off site until construction is completed. The construction of the riparian low flow control structure and the main pond outfall would occur within the bed and shore of Fulton Creek. To avoid issues with creek flow, construction within the creek is planned to occur in dry (or frozen) conditions in the fall of 2008 or the winter of 2008/2009. Equipment used for construction in the creek would be limited to a backhoe and erosion and sediment control measures would meet current City standards and be strictly enforced during work in or near the creek. All construction staging for project components would



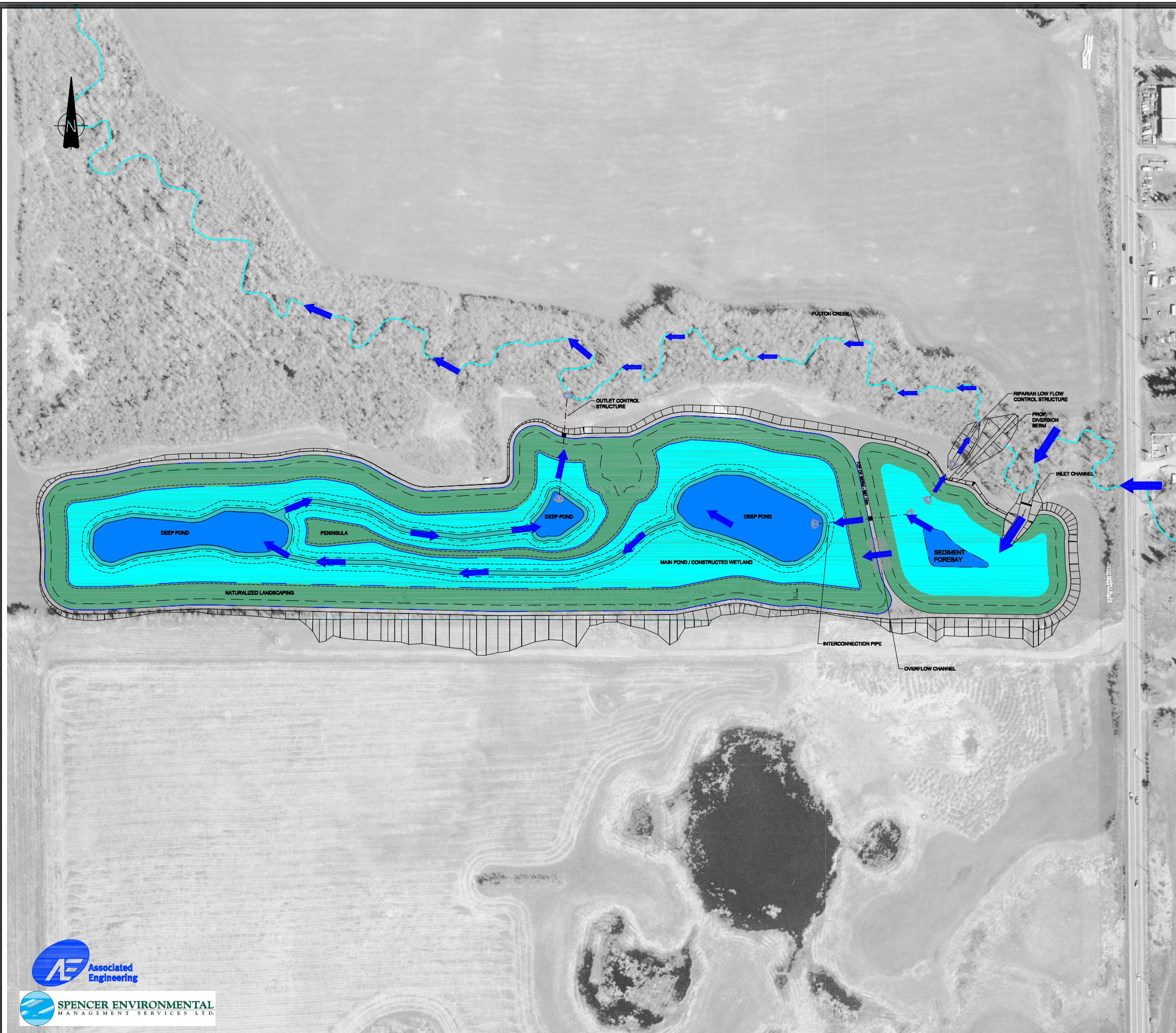
PYLYPOW REGIONAL  
STORMWATER MANAGEMENT /  
CONSTRUCTED WETLAND  
FACILITY

PROJECT COMPONENTS

← FLOW DIRECTION  
(NOTE: ARROW SIZE IS  
REPRESENTATIVE OF THE  
PROPORTION OF TOTAL FLOW)

SCALE 1 : 3000

DECEMBER, 2007



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be located within the footprint of the forebay and/or the main pond. Following the completion of construction within Fulton Natural Area, any areas disturbed during construction that do not support permanent infrastructure or otherwise need to remain unwooded, would, as best as possible, be restored to pre-development conditions. Site preparation and the excavation of the main pond are scheduled to begin in the latter parts of the winter of 2008 to the mutual benefit of another City of Edmonton construction project. Construction work within the Natural Area will likely be completed between fall 2008 and spring 2009. All construction (including landscaping) would be complete by March 2010. The facility would then become functional with the onset of spring thaw in spring 2010.

### ***Environmental Approval and Policy Requirements***

The Pylypow Regional Facility will require environmental approval and permits at various levels of government. At the municipal level, the project will require compensation pursuant to the City of Edmonton's Corporate Tree Policy C456. Pursuant to other City policy, a Natural Site Assessment encompassing the Fulton Creek Natural Area has been completed, and a Natural Area Management Plan is in the process of being developed. At a provincial level, the project's impact on the creek will require approval under the Alberta *Water Act* and the Alberta *Public Lands Act*. The project already has clearance to proceed under the *Historic Resources Act* as a result of earlier decisions by Alberta Community Development. Although not subject to specific approval or permits, the project will need to be in compliance with the laws of the Alberta *Wildlife Act* and the federal *Migratory Birds Convention Act (MBCA)* and *Species at Risk Act (SARA)*. Also at a federal level, the project is being reviewed pursuant to the Canadian Environmental Assessment Act, a process that was triggered by the expected receipt of federal funds through the Canada Alberta Municipal Rural Infrastructure Fund (CAMRIF). The proposed project may require approvals pursuant to the Canadian *Fisheries Act* and the *Navigable Waters Protection Act*, although the need for either of these is unlikely. The ESR document and the previously completed Environmental Assessment report (submitted to the CAMRIF Secretariat) for this project contain all the information necessary to enable the proponent to comply with all above-mentioned *Acts* and to enable the regulators to assess the project and proceed with necessary approvals.

### ***Description of the Environment***

Fulton Creek is a narrow, ephemeral, meandering creek located within a shallow ravine. During the early spring, snowmelt can generate considerable flow in the creek, however, during the rest of the year, flow in the creek is minimal and the creek often dries up by mid- to late-summer, although isolated pools may remain. Flows in the reach of Fulton Creek within the proposed project area are subject to upstream flow regulation by the Fulton Creek Marshland, an onstream stormwater management facility located approximately 3.3 km upstream of the proposed Pylypow Regional Facility. Between the Fulton Creek Marshland and the Pylypow Regional Facility project area, flows in Fulton Creek are augmented through the uncontrolled collection of surface runoff from surrounding agricultural and industrial areas. Very limited water quality data are available for Fulton Creek.

The section of Fulton Creek adjacent to the proposed project does not currently support fish and is incapable of supporting fish on a continuous basis. Use of the creek by fish resident to the North Saskatchewan River is also considered impossible as a result of the Mill Creek outfall structure (through which Fulton Creek ultimately drains), which is impassable to fish.

The Fulton Creek Natural Area comprises five different plant community types, however, the only community that would be directly impacted as a result of the Pylypow Regional Facility would be the balsam poplar forest, which occupies the ravine slopes and bottom. The balsam poplar community canopy consists of tall, mature balsam poplar trees. The moist, shady environment created as a result of the dense canopy cover supports a diverse understory comprising moisture-loving species such as raspberry, wild currants, red-osier dogwood and bush-cranberries. Overall, the species composition of the Natural Area includes relatively few exotic or weedy species and those present are not common.

The Natural Area is known to support a diversity of wildlife. Mammal species recorded within the Natural Area include microtines (i.e., mice and voles), weasel, snowshoe hare, red fox, coyote, deer and moose (Spencer Environmental 2002). Breeding bird surveys conducted in the Natural Area for a previous study recorded fifteen bird species, with the most abundant species being commonly-occurring, urban-adapted species that do well in small habitat patches or in edge habitat (e.g., American robin, yellow warbler and least flycatcher). Two of the observed species, the least flycatcher and Baltimore oriole, are considered Sensitive species in Alberta because of widespread population declines (Government of Alberta 2005). The Natural Area has the potential to provide at least temporary habitat for an additional 18 special status species. In general, however, the potential for the Natural Area to support species that would require special attention during project planning and implementation is low.

As of summer 2007, no formal recreational infrastructure existed within the project area or on adjacent lands. It is known, however, through observations and public consultation that a small number of people walk recreationally within the project area. Land use in immediately surrounding areas is limited to agriculture and a tree farm. The lands within the project area are, however, subject to designations pursuant to the Alberta *Municipal Government Act*. The portion of the Fulton Creek Natural Area comprising the creek and immediately adjacent lands subject to flooding is designated as Environmental Reserve. The area at the southwest corner of the Natural Area, outside of the floodplain, is designated as Municipal Reserve (MR).

#### ***Potential Environmental Impacts and Proposed Mitigation Measures***

Potential impacts were defined as effects that could occur as a result of a project feature/activity interacting with an existing resource, in the absence of mitigation measures. Mitigation measures were then developed for all identified impacts.

The majority of the Pylypow Regional Facility is being constructed on undeveloped, agricultural land with very few environmental sensitivities. The project components that would be constructed within the Fulton Creek Natural Area would, however, result in impacts to the creek, surrounding vegetation and wildlife.

The Pylypow Regional Facility would alter the hydrological regime in the creek reach between the forebay inlet (diversion) channel and the Argyll Tunnel. In general, instead of a rapid 'flush' of uncontrolled high water levels, the controlled release from the Pylypow Regional Facility would result in reduced peak flows and longer periods of attenuated flows. This would ensure that downstream flows remain within the capacity of the inlet section of the Argyll Tunnel and, in doing so, eliminate the chance of overloading and the associated flood risk that currently exists at the inlet to the Tunnel.

Overall, the Pylypow Regional Facility is expected to result in an improvement of water quality in Fulton Creek, with benefits extending downstream (i.e., to Mill Creek and the North Saskatchewan River). The forebay would ensure that all flows within the creek are, at a minimum, temporarily retained to provide for settling of suspended sediments, separation of floatables and detention of accidental releases. The main pond, including its emergent plant communities, would further slow flows, filter the water, and provide for nutrient uptake and, indirectly, bacterial breakdown of contaminants.

Sedimentation and/or contamination of Fulton Creek during construction are not a concern of this project. With the standard implementation of erosion and sedimentation control measures to the satisfaction of the City's guidelines, and the scheduling of instream construction activities during the late fall and winter (i.e., when no flow is expected in the creek), the potential for significant impacts of this sort to the creek is negligible.

The potential for the proposed project to impact fish is dependent on the presence of fish habitat in Fulton Creek and on the possibility of impacts to downstream fish populations. The reach of Fulton Creek within the project area does not currently support fish and is incapable of supporting fish on a continuous basis. The presence of the Mil Creek skimmer further downstream, reduces the potential for water quality impacts to travel as far as the North Saskatchewan River, where fish do reside. Given these findings, the Pylypow Regional Facility is not expected to affect fish or fish habitat.

No specific concerns with respect to slope stability or other geological issues have been identified for the proposed project.

The clearing of some native vegetation would be required to accommodate project components located within the Fulton Creek Natural Area and the immediately adjacent working areas. The total area that would be cleared of existing native upland vegetation would measure approximately 0.28 ha, much of which would be relatively mature balsam poplar forest. This area is, however, the smallest possible project footprint within the Natural Area that would still allow the realization of project objectives (i.e., during facility planning, the locations of outfall structures and other features were selected to



minimize the need for tree clearing), is on a small scale only and involves plant communities that are commonly occurring in Edmonton, are naturally dynamic and comprise species that are resilient to disturbance. No special status plant species are known to exist in the project area. All areas cleared of natural vegetation and not occupied by permanent infrastructure would be replanted with native species, making an effort to restore pre-construction conditions to the extent possible. Any net loss of vegetation would be mitigated through installation of natural plant communities around the main pond, with emphasis on lands between the pond and the Fulton Ravine. In this way, the new wetland will be integrated with the existing Natural Area and will be managed in future as a part of the Fulton Creek Natural Area.

The proposed project also has the potential to indirectly impact Natural Area vegetation. The attenuation of flows in the creek would result in a reduced occurrence of flooding and, possibly reduced soil moisture in some areas along the creek banks. It is plausible that such a change in creek flow and soil moisture could result in changes to the plant community along the creek banks. It is, however, also possible that in reaches of the creek experiencing longer periods of attenuated flows or backflooding, the drawn out presence of water could result in changes to the vegetation along the creek bed. Although there is some potential for the project to result in the increased abundance of weeds within the Natural Area, through the implementation of mitigative precautions, monitoring and weed control, it is expected that, in the long-term, the project will have a negligible impact with respect to weeds.

The loss of existing vegetation constitutes an associated loss of natural habitat for wildlife. However, as a result of the relatively small area that would be cleared (0.28 ha), the loss of habitat is not expected to impact the overall species composition of the Fulton Creek Natural Area. Despite this, much of the area to be cleared consists of relatively mature balsam poplar forest and, because of the need for permanent infrastructure, it would not be possible to restore the full area of cleared forest. The net loss of habitat will be mitigated by the measures used to mitigate the net loss of vegetation. The construction of the project would also have the potential to result in short-term alienation of some wildlife species from the Natural Area. Avoidance of vegetation clearing or wetland dewatering activities during the spring and summer wildlife breeding season will minimize the potential for wildlife mortality.

From a socio-economic resource perspective, the proposed project has a low potential to result in adverse impacts. There is little chance of impacting underground utilities as those present are, at their closest, approximately 20 m from the designated construction limits. The project area does not currently support any recreational infrastructure, nor does it support any formal or organized recreational activities. The proposed project would not adversely affect the public's use of the ravine and, in fact, the project would result in the creation of several recreational opportunities. The Pylypow project includes development of paved and unpaved trails, viewing platforms and interpretive displays and is expected to become an important park amenity and recreational site that will service the local industrial area, residents in nearby communities and the citizens of Edmonton as a whole. Construction in ravine lands designated Environmental Reserve

(ER) will require City Council's approval, otherwise, the project is in compliance with all other existing statutory land use designations. Impacts to visual resources, safety and historic resources are all expected to be negligible

***Summary and Conclusions***

The Pylypow Regional Facility Project is, on balance, a positive project that will result in several major positive environmental and socio-economic impacts, including a net gain of naturalized wildlife habitat, and a few minor, adverse impacts of a limited nature. This balance is the result of careful project planning that worked toward 1) selecting a project site that was strategically located to maximize environmental benefit and minimize adverse impact and, 2) a project design that will maximize facility function and value and minimize impact on adjacent sensitive lands. The most severe predicted adverse impact involves removal of and alteration to ravine woody vegetation, but this is on a small scale only and involves plant communities that are commonly occurring in Edmonton.

The proponent has committed to monitoring water quality and, pursuant to the wetland compensation requirements of the Federal wetland policy, biological performance of the constructed wetland. These programs will enhance the likelihood that facility operation will optimize provision of wetland function and will add value to the existing Fulton Creek Natural Area.