

Environmental Review

Section 1-041-01-W5M and a Portion of
S ½-12-041-01-W5M
Gull Lake, Alberta

Presented to

Ms. Jacqueline Penn
A.D. Williams Engineering Inc.



REVISION INDEX

ECOMARK Project No.: ADWIL-08502-15451.00-0					
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Letter Of Transmittal

October 14, 2008

Our Project Number: ADWIL-08502-15451.00-0

Ms. Jacqueline Penn
A.D. Williams Engineering Inc.
210, 7240 Johnstone Drive
Red Deer, Alberta, T4P 3Y6

Dear Ms. Penn

Re: Environmental Review

Section 1-041-01-W5M and a Portion of S ½-12-041-01-W5M, Gull Lake, Alberta

We are pleased to present the above referenced environmental review report (Report) for your benefit and use in assessing the environmental integrity of the property known as Section 1-041-01-W5M and a Portion of S ½-12-041-01-W5M, Gull Lake, Alberta.

This Report is based on a field reconnaissance and a records review, and conforms to the Environmental Review Guidelines set out by Lacombe County Planning and Development Department (July 2008).

The opinions expressed in this Report are solely those of Ecomark Ltd. This Report is furnished in our capacity as consultants to A.D. Williams Engineering Inc. (Client) for the project described in this Report and do not necessarily reflect the viewpoint of the Client. The Report is written for the benefit and use of the Client, Frank Wilson, Lacombe County, Alberta Environment, Alberta Sustainable Resource Development, and Fisheries and Oceans Canada (Parties) only and may only be relied upon by the Client and Parties in connection with the Environmental Review. Conditions assessed are valid to the date of visual assessment and limited by the information that was shared by the third parties involved. While every effort was made to confirm that the data collected from third parties is factual, complete, and accurate, Ecomark Ltd. makes no guarantees or warranties whatsoever with respect to such data. Liability is limited to the invoiced amount for the Report.

Yours sincerely,



Alicia Hamm, P. Biol.

Professional Seal

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EXECUTIVE SUMMARY

At the request of Ms. Jacqueline Penn of A.D. Williams Engineering Inc., Ecomark Ltd. was retained to perform an environmental review of the property known as Section 1-041-01-W5M and a Portion of S ½-12-041-01-W5M, Gull Lake, Alberta. The assessment is based on a field reconnaissance and a record review, and conforms to the Environmental Review Guidelines set out by Lacombe County Planning and Development (July 2008).

The environmental protection plan for the proposed development is found in Section 3 of this environmental review report (Report).

The opinions expressed in this Report are solely those of Ecomark Ltd. This Report is furnished in our capacity as consultants to A.D. Williams Engineering Inc. (Client) for the project described in this Report and do not necessarily reflect the viewpoint of the Client. The Report is written for the benefit and use of the Client only and may only be relied upon by the Client in connection with the Environmental Review. Conditions assessed are valid to the date of visual assessment and limited by the information that was shared by the third parties involved. While every effort is made to confirm that the data collected from third parties is factual, complete and accurate, Ecomark Ltd. makes no guarantees or warranties whatsoever with respect to such data. Financial liability is limited to the invoiced amount of the report.

1 INTRODUCTION

1.1 Scope

At the request of Ms. Jacqueline Penn of A.D. Williams Engineering Inc., Ecomark Ltd. was retained to prepare a environmental review report (Report) of the property known as Section 1-041-01-W5M and a Portion of S ½-12-041-01-W5M, Gull Lake, Alberta.

The Biophysical Assessment and Shoreline and Fish Habitat Assessment reports prepared by Ecomark Ltd. identified several biophysical features on the subject property that may be impacted by development of the subject property. This Report describes the nature and significance of environmental impacts associated with the proposed development during construction and once completed, the residential and recreational activities that will result.

This Report also includes an environment protection plan to alleviate any adverse environmental impacts, monitor the performance of the environmental measures, and identify any residual impacts and their significance to fish and wildlife, vegetation, soils and terrain, water quantity and quality, and shoreline.

1.2 Development Project Description

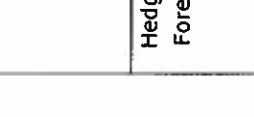
Presently, the subject property is zoned as "A" Agricultural land use. It is proposed that the subject property be developed into an 18-hole public golf course, driving range, pro-shop, restaurant, 2200 Bare Land Condo lots and 194 daily rental lots along with an inland marina, boat launches, and a public beach and picnic area.

2 ENVIRONMENTAL SENSITIVITY AND POTENTIAL IMPACTS

Ecomark Ltd. identified several biophysical features on the subject property that may be impacted by development of the subject property. These features include temporary Class II wetlands, hedgerows and forested areas, sedge meadows, the shoreline along Gull Lake, and cultivated agricultural land. The environmental sensitivity of these biophysical features and potential impacts associated with the proposed development are summarized in Table 1. For a detailed description of the biophysical features, please refer to the Biophysical Assessment and Shoreline and Fish Habitat Assessment reports (Ecomark, 2008a; Ecomark, 2008b).

Table 1: Environmental Sensitivity of Lands and Potential Environmental Impacts Associated with Proposed Development

Vegetative Feature	Description	Potential Negative Environmental Impacts	Potential Positive Environmental Impacts	Environmental Sensitivity
Temporary Wetlands	<ul style="list-style-type: none"> Topographically defined depressions that maintain surface water for a few weeks after snowmelt and occasionally for several days following heavy rainstorms Consists of common great bulrush, sedges, mixed grasses, and weedy vegetation 	<ul style="list-style-type: none"> Changes to wetland hydrology Removal of habitat for wetland dependent plants and wildlife 	<ul style="list-style-type: none"> Construction of naturalized stormwater management facilities may enhance habitat for waterfowl 	<p><i>LOW</i> – The wetlands were impacted by agricultural activities. Wetlands do not provide high quality nesting or breeding habitat for birds or amphibians due to the presence of weedy vegetation. Removal of wetland features will not significantly impact the ecological integrity of the subject property.</p>
Hedgerows and Forested Areas	<ul style="list-style-type: none"> Mature balsam poplar hedgerow with well-developed understorey vegetation A mature mixedwood forest of similar composition along the north- and east-facing slopes towards Gull Lake A young deciduous forest primarily consisting of trembling aspen, balsam poplar, willow, mixed grasses, and forbs closer to Gull Lake 	<ul style="list-style-type: none"> Removal of nesting and feeding habitat for birds that rely on forest edges Removal of cover and feeding habitat for small mammals and ungulates 	<ul style="list-style-type: none"> Where existing forest vegetation cannot be incorporated into development, vegetation will be replanted with species naturalized to the Central Parkland subregion of Alberta 	<p><i>HIGH</i> – Forested areas promote biodiversity, provide high quality plant and wildlife habitat, and provide recreational opportunities for the public. Development may potentially fragment wildlife habitat and remove valuable forest edge.</p>
Sedge Meadows	<ul style="list-style-type: none"> Unique vegetative feature that transitioned from the young deciduous forests Also found in topographical depressions within the forested areas Consists of sedges, rushes, mixed grasses, and forbs 	<ul style="list-style-type: none"> Erosion and soil compaction Growth of weedy vegetation Removal of valuable nesting and feeding habitat for birds Increase sedimentation and nutrient loading in to Gull Lake 	<ul style="list-style-type: none"> Developer acknowledges sensitivity of sedge meadows. Large areas will be kept intact at the northern portion of the subject property 	<p><i>HIGH</i> – Sedge meadows are unique vegetative features to Gull Lake due to decline in water levels. Vegetation is of early successional stages and particularly susceptible to erosion, soil compaction, and growth of weedy vegetation. Development without appropriate mitigation measures may contribute to deteriorating water quality in Gull Lake.</p>



Vegetative Feature	Description	Potential Negative Environmental Impacts	Potential Positive Environmental Impacts	Environmental Sensitivity
Shoreline	<ul style="list-style-type: none"> Bands of emergent aquatic vegetation consisting of common great bulrush and common cattail Beds of submergent aquatic vegetation consisting of pondweed, northern watermilfoil, and flat-leaved bladderwort Fine substrates, small gravels, large gravels, cobbles, and boulders along shoreline 	<ul style="list-style-type: none"> Removal of valuable nesting and feeding habitat for birds that rely on lake margins Removal of valuable spawning, rearing, and feeding habitat for fish Increase sedimentation in to Gull Lake Potential release of toxic materials in to Gull Lake 	<ul style="list-style-type: none"> Shoreline will be preserved with a 30-meter buffer designated as Environmental Reserve (ER) 	<p><i>HIGH</i> - Biophysical features provide high quality habitat for birds and fish. Development of the shoreline may contribute to deteriorating water quality in Gull Lake.</p>
Agricultural Land	<ul style="list-style-type: none"> Cultivated agricultural land consisting of canola crop 	<ul style="list-style-type: none"> Removal of high quality topsoil 	<ul style="list-style-type: none"> Natural features that enhance the development may provide suitable habitat for plants and wildlife 	<p><i>LOW</i> - This vegetative feature does not provide high quality habitat for plants or wildlife. The removal of this feature is a consequence of development and will not impact the ecological integrity of surrounding areas.</p>

3 ENVIRONMENTAL PROTECTION PLAN

3.1 Environmental Measures to Alleviate Potential Adverse Impacts

The following environmental measures are proposed to alleviate adverse impacts identified in Table 1 and create an ecologically appropriate development:

- Incorporate existing forest vegetation within the development design (i.e. golf course, seasonal lease lots, daily rental lots, etc.) with minimal disturbance, where possible.
- Do not remove forest vegetation along forested slopes and maintain a minimum 3-meter vegetated buffer at the toe-of-slope, to reduce the risk of erosion.
- Where forest vegetation cannot be incorporated into development, replant forest vegetation with plant species naturalized to the Central Parkland subregion of Alberta.
- Maintain a minimum 3-meter buffer along valuable forest edges at the northern portion of the subject property, where possible. Grading too close to forest edges may impact root systems and lead to premature decay and windthrow.
- Maintain continuous areas of forest vegetation along forested slopes to promote connectivity for birds, small mammals, and ungulates.
- Do not remove forest vegetation during bird nesting seasons (i.e. April 15 to August 15).
- Maintain a minimum 30-meter vegetated buffer above the ordinary high water mark on the subject property to maintain surface water quality and maintain valuable sedge meadow habitat along Gull Lake. Designate this area as Environmental Reserve (ER) land use.
- Design stormwater management facilities so that stormwater from development will not enter the proposed marina or Gull Lake. All developed areas (including parking lots) will drain inland towards a stormwater management facility prior to release.
- Enhance stormwater management facilities with aquatic vegetation. To promote the growth of aquatic vegetation in these areas, collect bottom ooze and young plugs from impacted areas along the shoreline and plant in stormwater management facilities.
- Fence off the 30-meter vegetated buffer on the subject property to prevent heavy equipment and motorized vehicles from trampling sedge meadows during construction.
- Following construction, prohibit motorized vehicles from accessing ER lands and public lands east of the subject property. These areas should be limited to pedestrian access only along designated trails.

- Build boardwalks through sedge meadow habitats to prevent excess trampling in these environmentally sensitive areas.
- Salvage topsoil and subsoil from the subject property and store in separate stockpiles prior to grading activities. Replace topsoil and subsoil in proper sequence in areas to be revegetated following construction. Bring in additional topsoil for landscaping, in cases where adequate topsoil cannot be salvaged.
- Ensure that the beach development does not encroach on public land. Beach volleyball courts, picnic areas, change rooms, and bathroom facilities should be situated in upland areas away from the beach water interface.
- Minimize the use of pavement and asphalt in parking areas within the 1:100 year flood plains. Consider using strips of pavement intermixed with strips of vegetation in order to break up stormwater flow.
- Design the marina egress and ingress to follow the shoreline contours to reduce shoaling and dredging frequency.
- Maintain existing bands of emergent aquatic vegetation and beds of submergent aquatic vegetations along the shoreline to provide erosion control and maintain valuable bird and fish habitat. Limit the removal of aquatic vegetation to the channels leading to the egress and ingress of the marina and the proposed beach development.
- Assign navigational markings and boating speed restrictions through the section of emergent aquatic vegetation to minimize impact to existing aquatic vegetation and wildlife use.
- Follow best management practices to prevent adverse effects on fish and fish habitat during construction, including:
 - Plan the project so that the amount of in-water work is kept to a minimum. Conduct dry land excavations during winter. If possible, plan in-water work to occur as a single event.
 - If equipment must enter the lakebed, use an in-water pad constructed of washed gravel where equipment would generate excess sediment.
 - Ensure machinery arrives onsite clean and free of fluid leaks.
 - Ensure equipment leaves clean to reduce disease transfer.
 - Store toxic materials (i.e. fuel, lubricants, hydraulic fuel, etc.) and refuel equipment at least 100 meters from the lake.
 - Use environmentally friendly products in equipment operating in the lake.

- Begin reclamation and site cleanup as soon as construction is completed.
- Install an in-water silt barrier around the construction site to isolate disturbed, turbid areas during construction of the egress and ingress.
- Install a series of erosion control structures (i.e. silt fences) in upland areas to eliminate sedimentation into Gull Lake during construction. Install coconut matting or equivalent biodegradable matting with impregnated seed and a quick catch sterile fall rye (or equivalent) near the water's edge.
- Ensure in-water construction of the egress and ingress and dredging activities occur between July 15 and September 1 to avoid fish spawning seasons, where possible. Excavation of inland areas should occur during winter.
- Relocate any sand excavated during construction of the marina to the proposed beach development.
- Cease construction in the event of high water levels or a heavy rain event.
- Respond to releases of potentially toxic materials using spill kits onsite. If safe to do so, clean up all spills in and around the construction site and report to Alberta Environment 24-hour spill reporting line: 1-800-222-6514.

3.2 Monitoring Performance of Environmental Measures

To monitor the performance of the above-mentioned environmental measures during construction, designated construction personnel will be responsible to ensure that all equipment operators and personnel adhere to the proposed environmental measures. The designated personnel will inspect sediment control structures and silt fences weekly and remedy any issues that may arise.

A Qualified Aquatic Environmental Specialist (QAES) will be onsite to monitor water quality during any in-water construction and dredging activities. Confirmatory samples will be sent to the laboratory and analyzed for total suspended solids, total dissolved solids, and turbidity. A post-construction monitoring report will be prepared and submitted to interested government agencies following the in-water construction activities.

3.3 Residual Impacts

Residual impacts of the proposed development will be limited to the removal of the temporary Class II wetlands on the subject property, removal of existing fish habitat near the proposed marina and beach development, and removal of cultivated agricultural land. Removal of cultivated agricultural land is a consequence of development and should not negatively impact the ecological integrity of surrounding areas.

Loss of any naturally occurring wetland features in Alberta may be subject to wetland compensation under the *Water Act*. Prior to construction, a wetland compensation proposal will be submitted to Alberta Environment for approval. Well-designed, naturalized stormwater management facilities that supports emergent aquatic vegetation and sedges (*Carex* spp.) may provide adequate compensation. Alternatively compensation may be paid to a recognized wetland restoration agency to complete a wetland restoration project nearby the subject property.

Similarly, removal of fish habitat is considered "harmful alteration, destruction, or disruption" (HADD) and is subject to compensation under the *Fisheries Act*. Although the above-mentioned environmental measures will significantly reduce the amount of HADD, compensation may be required for loss of fish habitat around the egress and ingress channels of the proposed marina and the proposed beach development. To compensate for these residual impacts, all gravel and cobble excavated on the subject property will be used to build an alternative lake whitefish spawning area off of the public lands area south of Sandy Point. Clean washed cobbles and boulders will supplement any additional substrates that are required to enhance the spawning area. Appropriate compensation will be determined prior to development of the subject property.

4 CONCLUSION

Several dominant biophysical features were identified on the subject property that may be impacted by development of the subject property. These biophysical features include temporary Class II wetlands, hedgerows and forested areas, sedge meadows, shoreline along Gull Lake, and cultivated agricultural land. The biophysical features most sensitive to development were: 1) shoreline along Gull Lake; 2) sedge meadows along the shoreline, and; 3) mature mixedwood forests of forested slopes.

The proposed development is an ecologically appropriate development. Environmental measures were proposed to alleviate adverse impacts to the most sensitive biophysical features. Designated construction personnel and a QAES will monitor the performance of the environmental measures during construction. For all other residual environmental impacts that cannot be alleviated, appropriate compensation will be provided prior to development of the subject property.

Appendix 1: Qualifications and Information Pertaining to the Environmental Consultants

Name of Firm: Ecomark Ltd.

Address: 100 – 14964 – 121A Avenue, Edmonton, Alberta T5V 1A3

Phone: (780) 444-0706

Fax: 1-866-337-8631

Date Established: January 11, 2000

Insurance Coverage:

- ❖ Professional Errors & Omissions - \$2,000,000
- ❖ Commercial General Liability - \$1,000,000
- ❖ WCB Account

Safety Training: All professional staff at Ecomark has appropriate safety training in WHIMS, H₂S Alive, TDG, First Aid and Ground Disturbance Practices.

We excel in assessments, reclamation and remediation, and corporate environmental management. Our experience covers phase 1, 2, and 3 environmental assessments and environmental audits on the widest variety of industrial/commercial and residential properties and companies. We also have extensive facility experience, from scouting potential routes and facilities, through audit of existing facilities, to final reclamation and restoration of disturbed habitats.

One of our key strengths is corporate (government) liability assessments. We evaluate the environmental liability incumbent to a site or sites. We have been relied on by major corporations to place a monetary value on the environmental liability of assets being acquired, disposed of, or maintained.

Our staff provides Ecomark with 28 years of individual professional experience. We have appropriate professional errors and omission (E&O) insurance, contractors general liability (CGL) insurance, and Worker's Compensation. We have also attained Small Employer Certificate of Recognition (SECOR) safety status. A professional biologist, professional chemist, professional engineer, or professional geologist warrants all our work. We do quality, fully warranted assessments that all parties can understand.

Ecomark Ltd. Projects and Experience

Phase 1 Environmental Assessments

Phase 1 environmental assessments throughout Canada

Phase 2 Environmental Assessments

Phase 2 environmental assessments throughout Canada

Tier 2 risk assessments, Airdrie, Sunde, and North Garrington, Alberta

Phase 3 and 4 Environmental Assessments

Oilfields reclamation in Devon, Bonnie Glen and Redwater

Oil lease cleanups

Class 3 railway derailment cleanup and complete railway line abandonment

Diesel spill remediation

Fuel tank removals and cleanups

Underground storage tank remediation

Contaminated soil cleanups

Landfill reclamations

Salt spill weeping tile design and geotechnical assessment

Bioremediation, audit, waste cleanup, and process redesign

Erith River crossings reclamation

Peat bog sewage treatment field reclamation

Grading, cleanup, and reclamation of Mountain Park Loop

Pipeline crossing inspection, creek monitoring, and reclamation

Native grass and forbs species research for boreal forest reclamation

Stabilization of a mineral spring

Mitigation measures and further recommendations for rare native grasslands

Constructed wetland, survey, plan, construction

Wastewater tertiary treatment

Mould Assessments

Mould assessments

Indoor air quality assessments

Assessments – Reports, Acquisition, Habitat, Hazard, Environmental Impact and Others

Corporate environmental acquisition assessments
Chemical/brownfield site assessments
Federal and provincial environmental impact assessments
Health risk impact assessment, Health Board equivalent of an EIA
Environmental compliance audit for health facilities
Commercial environmental audits and technical reviews
Hazard identification assessments for industry, developers, and municipalities
Complete biophysical assessments, including wetland and aquatic assessments Compost
research and field application trials
Nutrient management in intensive livestock operations
Effects on nitrogen leaching in soils with the application of bedding
Effects of phosphogypsum on compost
Waste operations
Route selection and design of river crossings for pipelines
Technology evaluations for secondary off-gas treatment, cement kiln
Scouting, application, and approvals for linear development projects
Medicine Lodge Loop environmental assessment
Environmental field report for Cheviot and Mountain Park Railway
Stormwater outflow inspection and installation, Atim Creek
Culvert installation under Atim Creek CN Right-Of-Way
Aquatic inspection in Athabasca and North Saskatchewan drainages
Fisheries monitoring studies and research and creek fisheries assessments
Transalta fish recovery tank for Lake Wabamun
Dredging impact literature search and sediment survey, Lake Wabamun
Rare plant studies throughout western Canada, including a study covering 1.8 million
hectares in northwestern Saskatchewan, and smaller studies in BC and Alberta
Technology, composting alternatives, fly ash for road building material

Air, Water, Soil and Biomonitoring

Groundwater monitoring
Soil monitoring
Vegetation, lichen, and agricultural field biomonitoring
Establishment of biomonitoring plots complete with FCIR and Air Photo interpretation
Indoor air quality monitoring

Environmental Systems Development

Landfill design and development
Establishment of bioremediation, composting, and recycling facilities
Environmental training module and delivery
Environmental procedures manual for North American Construction Group
EUB waste module manual and delivery
Northern Alberta compost brochure and manual
Building operator training program waste module
Habitat restoration and environmental aspects of linear development
Fisheries training (linear development)
Cleanup of upstream oilfield sites for World Bank Russia training program
Training for Alberta Onsite Waste Water training program
Waste management system development
Waste module for downstream oilfield operations in Venezuela
Waste audit report on waste resource management at Northlands Park
Management of animal bedding from a race track by diversion from landfill and use in composting or incorporation into farm fields
Compost marketing study for the University of Alberta
Sewage field testing
Intensive livestock composting seminar for the County of Lamont
Assessment of waste dewatering market for Western Canada
Waste audit and waste minimization implementation
Development of integrated waste management facility for Fero, Yukon
Environmental management course, waste management, construction, and operations for Russia World Bank
Development of waste management facility for Margao, India
International hazardous waste management pricing survey
Operational enhancement of community septic system and design of new infiltration field
Establishment of hazardous waste transfer station, including market analysis
Assistance in establishing bioremediation market
Assistance and rewrite of production unit subscription and business plan
Assistance on CADR grinding technology
Assessment of proposals for PCB regulatory framework for Colombia
Historical environmental review for Paintearth Resource Recovery Centre, Coronation, Alberta
Energy management plan
Development of micropower interconnection on-line manual

Installation of monitoring and demonstration system for solar heating project

Applications, Licenses, and Regulatory Assistance

Facility approval applications

Integrated municipal waste facility Board of Health application

Industrial application for waste handling facilities

Waste management applications

AEUB Guide 58 applications

AEUB Guide 55 support

Water well application for facility water supply system

Redefinition of hazardous waste for Canadian Environmental Protection Act

Assessment of regulations for importation of hauling waste from other countries

Development of the Medicine Hat Waste Management Facility, Petro-Canada

Development of the Paintearth Resource Recovery Centre

Development of commercial land for Wetaskiwin, Alberta