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Report

City of Whitehorse

Whistle Bend Subdivision Environmental and Socio-Ecomonic Assessment Report

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Whistle Bend Subdivision Environmental and Socio-Economic Assessment Report

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Project Number:

108010

Date:

November, 2009

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November 4, 2009 Project Number: 108010

Kinden Kosick
Planner
City of Whitehorse
4210 Fourth Avenue
Whitehorse, YT

Dear Mr Kosick:

Re: Whistle Bend Environmental and Socio-Economic Effects Assessment

On behalf of AECOM and our associate Vector Research, we are pleased to provide you with out final report that addresses the environmental and socio-economic effects assessment in regards to the planned subdivision, Phases 1 and 2 of Whistle Bend.

Should you need to contact AECOM concerning this report, please call me at 867-633-6474 extension 5741

Sincerely,
AECOM Canada Ltd.

K. Wood.

Kathleen Wood, B.A.
Regulatory Specialist

Signature Page

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Executive Summary

Yukon Government and the City of Whitehorse wish to develop the first two phases of the Whistle Bend Subdivision, located on the Lower Porter Creek Bench at the north end of the City. Before the project can proceed, it must be assessed under the *Yukon Environmental and Socio-Economic Assessment Act* (YESAA) and the Government of Yukon must issue a Decision Document.

The proposed Whistle Bend subdivision has incorporated sustainability objectives into the overall footprint and the community-based design of the project. The Project fits within the City of Whitehorse's *Official Community Plan*, and indeed represents a significant area of future residential expansion within the City limits. The Project, comprising Phases 1 and 2 of the development of Whistle Bend, is expected to provide approximately 1000 residential units in a variety of housing forms and densities. The subdivision detailed designs are nearing completion, and zoning for the area was approved by the City on July 27, 2009. The City then approved the subdivision of the land on August 24th, 2009, thus allowing for the legal survey process to be implemented. All lots in the subdivision will be fully serviced, and the on-site servicing, including streets, water, sewer and pedestrian access has been incorporated into the design. Off-site transportation, water and wastewater services required for Phases 1 and 2 have been identified and are included within the scope of this Project. These off-site services include, for example, a 2-lane road (Whistle Bend Way) originating at Mountain View Drive, upgrade and extension of the existing trunk water main along Range Road, and a new (on-site) sanitary lift station and sanitary force main from the site to the existing Porter Creek Flush Tank.

Planning for the Whistle Bend neighbourhood began in the fall of 2006 with a multi-day charrette that culminated in a Community Concept Plan that received support from the community at large. Over the past two years, the City of Whitehorse has conducted an intensive public consultation process as part of the planning for Whistle Bend, and on February 2009, a Master Plan concept was approved by City Council. Since February, detailed subdivision designs for the first two phases of the development have been prepared.

As part of project preparation, an environmental and socio-economic assessment of the Project was undertaken. The results of that assessment are presented in this report. This report is intended to provide sufficient information about the project for the Whitehorse Designated Office to complete its assessment of the project and make a recommendation to the Government of Yukon.

This assessment considered all potential environmental and socio-economic effects that may result from the construction and operations phases of the project, including both on-site and off-site components. The effects of the project were assessed in relation to the following valued ecological components:

- Air Quality
- Soil and Terrain Stability
- Stable and Self-sustaining Vegetation Cover
- Protection of Rare Plants

- Wildlife Diversity and Habitat
- Surface Water Quality and Flows
- Fish Population Abundance and Diversity
- Fish Habitat
- Recreational Use
- Heritage Resources
- Existing Infrastructure and Services (traffic, Protective Services; Schools)

During construction, potential adverse effects have been identified but are not considered to be significant. Most can be addressed through the application of Best Management Practices and other practical measures to ensure that air quality, water quality and habitat effects are minimized. Increased traffic, noise and disturbance during construction are unavoidable, but will be short-term and localized. Again, wherever practical, practices will be applied to minimize potential disruption to local residents and nearby neighbourhoods.

The potential adverse long-term effects of the Project result from the permanent change to the existing landscape, in that there will be permanent loss of existing vegetation and undeveloped open space. However, this is consistent with the community vision as detailed in the *Official Community Plan*. The off-site services have been planned to accommodate the expansion of population, and again, must be considered in the context of urban development of the City. The potential long-term effects of the Project have been offset by the reduced footprint, carefully situated on the Lower Porter Creek Bench and design features that incorporate a large percentage of greenspaces and on-site drainage features.

The assessment team has evaluated the potential effects of the Project and concluded that, with the application of mitigation measures as proposed, the Project is unlikely to cause any significant adverse environmental or socio-economic effects.

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1. Introduction

Whistle Bend was identified as the next major residential development site for the City of Whitehorse in the *2002 Official Community Plan* (OCP) due to its large size, location and relatively flat topography. The Government of Yukon and the City of Whitehorse are jointly planning and implementing the Whistle Bend Project. The Government of Yukon, Community Infrastructure Branch is the developer of the overall *Whistle Bend Master Plan*, and the City of Whitehorse is the approving authority for the Project. The assessment of the environmental and socio-economic effects of the Phase 1 and 2 Whistle Bend Project (the Project) is the subject of this report.

1.1 Location

The Whistle Bend Study Area comprises 730 hectares located on the Lower Porter Creek Bench within the City of Whitehorse, Yukon Territory, as seen in Figure 1. The Study Area is 7km northwest of the Whitehorse downtown core and is bounded by the Yukon River on three sides and steep slopes up to the existing neighbourhood of Porter Creek on the remaining side. The Study Area is largely undeveloped land, with the exception of the Heiland farm, Mountain View Golf Course, the Navigation Canada (NavCan) and CBC communications facilities, and the Horse and Rider's Association's facilities. The decommissioned Porter Creek sewage lagoons are located in the northwest corner of the Study Area. Two parcels of undeveloped Settlement Land are located within the Study Area – C43B and C9B owned by the Kwänlin Dun First Nation and Ta'an Kwäch'än Council, respectively.

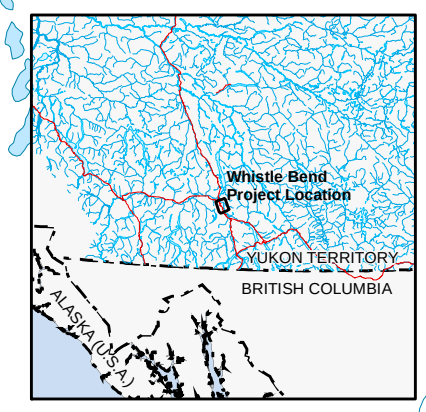
The new subdivision received its name from a historical reference from the gold rush era. Steamships on the Yukon River that were navigating the corner around the Lower Porter Creek Bench used to blow their whistles so other boats would be aware of their proximity.

1.2 YESAA Triggers

The Project requires a YESA evaluation based on the following activities listed in the Schedule 1 under the *Yukon Environmental and Socio-Economic Assessment Act (*the Act*)*;

- Part 6.10. "Construction, modification, or decommissioning of a public road, including a public road used only in winter."
- Part 13.12 " Moving earth or clearing land using a self-propelled power driven machine";
- Part 13.13(b) Levelling, grading, clearing, cutting or snow ploughing of the right-of-way of a power line, pipeline, railways line or road."

In addition, Section 47 (2b) of the Act states that if "a territorial agency, municipal government, territorial independent regulatory agency or First Nation is the proponent then an authorization or the grant of an interest in land would be required for the activity to be undertaken by a private individual." In this case, the Government of Yukon is the proponent.



Crestview

Porter Creek

Whistle Bend

Phase 2

Phase 1

RIVER

McIntyre

Copper Ridge

Downtown

Riverdale

YUKON

ALASKA HIGHWAY

McIntyre Creek Drive

Mountain View Drive

Range Road

Imagery from Yukon Government

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Legend

Development Boundary

Whistle Bend Project Location Map

November 2009
Project 108010

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Figure 1

Map Document: (S:\GIS_Proj\y2008\80498-108010_WhistleBend\MXD\108010_WhistleBend_Figure1_rh_30Sept2009.mxd)

1.3 Report Organization

This report is intended to provide the necessary information to the Whitehorse Designated Office to inform a recommendation to the Government of Yukon. This information has been laid out systematically to provide a clear evaluation of the environmental and social-economic effects of the project. The following paragraphs summarize the structure and main content of this assessment report:

Whistle Bend Master Plan Concept
An introduction to the concept and vision of what the subdivision will be like at complete build out. The project is described to give a sense of time and magnitude of the project as a whole and to give a sense of how Phase 1 and 2 fit into the larger development. A brief description of the different concept plans that were initially designed and how the *Whistle Bend Master Plan* reflects important design elements from each. Also described are the sustainability aspects and objectives that were identified as guides for this development through consultation.

Consultation
A continuous process of consultation was undertaken throughout the planning and design of the Whistle Bend Project. This section summarizes the participants and events that occurred as the *Master Plan* was developed and explains the unique outcome of integrated mitigation as input was incorporated into the design as the issues and concerns were raised.

Project Description
Description of all onsite and offsite activities involved to complete Phase 1 and 2 of the Whistle Bend Project. This section breaks down the onsite activities into two sections: those that take place within Phase 1 and 2 boundaries and those that are necessary for Phase 1 and 2 but are on land laid out for later phases of the subdivision. The offsite activities are divided into three sections: water servicing, wastewater, and transportation.

Existing Environmental and Socio-economic Conditions
A description of the existing biological, physical, and socio-economic conditions of the Study Area is given This includes: 1.) Climate, 2.) Water Resources, 3.) Terrain and Vegetation, 4.) Wildlife Resources, 5.) Fish and Fish Habitat, 6.) Land Status and Use, 7.) Recreational Use, 8.) Cultural and Heritage Resources, and 9.) Socio-economic conditions.

Environmental and Socio-economic Effects Assessment
The scope of the assessment is defined temporally and geographically and phases 1 and 2 are placed within these confines. The scope and impact of a cumulative effects assessment is described in regards to the specific nature of the dynamic growth of a city. The valued ecological and socio-economic components (VECs and VSECs) of the Project are systematically identified and the effects on these are then addressed in two time phases: Construction and Operations. Assessment of effects for the Construction and Operations Phases of the Project are summarized in tables where each VEC and VSEC is examined within these two phases by identifying the potential effect, mechanism, mitigation and significance.

2. Whistle Bend Master Plan Concept

2.1 Concept History and Rationale

The land designated for the Whistle Bend subdivision has been identified for residential development by the City of Whitehorse in the 2002 Official Community Plan. The concept of the Whistle Bend subdivision is a direct result of extensive consultation between City planners, members of the public, First Nations, consultants, local businesses, and territorial and federal governments. The vision is that Whistle Bend will become a benchmark of community sustainability for northern communities. It will offer efficient land use, integration with nature, and renewable energy usage, while fostering a sense of community with a distinct neighbourhood character.

The estimated timeframe for the Whistle Bend development to reach complete build-out is forecasted for twenty-five years, encompassing approximately six phases of development. The concept has been planned in orderly, phased developments where the first two phases will be the catalyst for the remainder of the phases. Phases have been identified to provide adequate infrastructure and facilities to support the growth of the subdivision, its residents and the City as a whole. The actual timing for completion, and the actual number of phases, will depend on market demands and the future population growth of the City of Whitehorse.

At complete build-out, the population is forecast to be between 8,500 and 10,000 people. This is somewhat dependent on the type of housing mix that will be eventually developed; therefore, the population estimate will vary depending on whether there is a greater preference for lower density single-family housing lots or higher density multi-family units. When Whistle Bend reaches ultimate build-out, the subdivision will cover approximately 250 ha, which includes subdivision roads and on-site services. Trails, recreational areas and greenspaces have been incorporated into the design.

The approved *Final Master Plan* (February 2009) concept was largely guided by the underlying objectives arising from the 2006 Charrette. These objectives were identified to create a subdivision that would reduce use of fossil fuels, reduce solid waste sent to the landfill, adopt greener and smarter infrastructure, minimize the footprint of roads and parking lots, attract a diverse population of cultures and socio-economic backgrounds, and reduce the domestic consumption of water. The *Whistle Bend Master Plan* (see Figure 2*)* includes a town square, commercial, community gardens, an elementary school, high schools and recreational facilities. The *Whistle Bend Master Plan* also involves engineering storm water drainage facilities, as one of the sustainability goals was to achieve a post-development zero net increase in run-off from the site.

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Master Plan Legend

- Housing Mix A
- Housing Mix B
- Mixed Use
- Commercial
- Community Use
- Institutional
- Parks and Greenspace
- Recreation
- Natural Open Space
- Private Land
- Trails
- Phase Boundary

Map Sources / Notes:
Map compliation and prduction a collaboration between City of Whitehorse, Planning Department and AECOM

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Reviewed by: Initials   Prepared by: RH
Date Issued: 3 Nov 2009   Project Number: 108010

Whistle Bend Master Plan Concept

AECOM

Figure 2

The *Whistle Bend Master Plan* is the product of an exceptionally intensive public consultation process (see Section 3). As a result, the Whistle Bend planning process is a rare example of dynamic effects assessment (as contrasted with a step-wise or linear type of assessment process). As issues were identified in the planning process (as far back as mid-2006 during pre-Charrette activities), solutions to the issues raised were used to guide the development of the *Whistle Bend Master Plan*. Five sustainability objectives were derived through consultation and guided the development of the *Whistle Bend Master Plan*:

Sustainability Aspect	Sustainability Objective
energy	• maximize heat gain and minimize heat loss • eliminate use of fossil fuels for energy generation
mobility	• create a community for people, not cars • encourage alternate forms of transportation
social fabric	• create a community that is progressive from a social, economic and cultural perspective
water	• avoid waste of potable water
waste	• reduce solid waste to landfill • eliminate contaminants in water • reduce particulate matter in the air

2.2 Alternative Development Concepts

The *Whistle Bend Master Plan* is the result of the cohesion of the three original concept plans presented at the Community Café, held in October 2008. The three plans were developed from the Whistle Bend Neighbourhood Concept that resulted from the 2006 Porter Creek Bench Charrette. At the Café, people voted on the elements of each concept that they supported. The *Whistle Bend Master Plan* reflects the synthesis of these preferences. The three concept plans were designed to reflect sustainability and community cohesion and all of the concept designs incorporated a maximum five minute walk to a park or greenspace within the community.

The three plans put forward were the Green Corridors Concept, Grand Vista Concept, and the Town Square Concept. Popular features of each were used to create the *Master Plan*. Elements such as the fused grid and central town square from the Town Square concept were incorporated while an adaptation of the 50 m wide central greenspace from the Green Corridors concept was designed in through a large multi-use periphery rail connected throughout the entire development with greenbelt fingers. The *Whistle Bend Master Plan* was approved by Whitehorse City Council in February 2009.

2.3 Future Long-term Infrastructure Development Activities

As identified in the *Whistle Bend Master Plan, Whistle Bend Traffic Network Impact Study, and Whistle Bend Off and On-Site Infrastructure Reports* there are multiple activities that will be necessary to support later phases of Whistle Bend but are not required for Phases 1 and 2. As such these activities are outside the scope of this assessment, but will be assessed as part of future phases of development. These activities will include, but are not necessarily limited to:

- Construction of Alaska Highway Connector and Pine Street Extension (includes McIntyre Creek crossing)
- Construction of College Road Access Extension
- Remediation of Porter Creek Lagoons
- Relocation and Remediation of CBC
- Construction of additional cells in existing City Reservoirs
- Twining the Porter Creek Flush Tank force main

3. Consultation

Consultation has been a fundamental aspect of the design and assessment process for the proposed Whistle Bend subdivision since the initial concept stages of the project. A broad range of expertise and points of views combined with diverse methods of participation have been used to capture as many concepts, ideas, and interests as possible. The consultation process was initiated in 2006 as part of the preparation for the design Charrette, which set the tone for a high level of consultation throughout the entire planning and assessment process.

The dynamic consultation process enabled many potential problems and concerns to be addressed during the planning and design stages in order to avoid mitigation problems in later stages. As environmental and socio-economic issues were identified very early in the planning process, solutions were identified and incorporated into the final *Whistle Bend Master Plan*.

The following is a summary of the consultation process:

3.1 Pre- Charrette Consultation

Leading up to the Charrette several events were held in order to organize and promote the November 2006 Charrette. These are outlined below:

Table 1. Pre-Charrette Consultation

Event	Date	Purpose & Attendance
Public Project Launch	12 Sept. 2006	City of Whitehorse, CMHC, and consultants discussed background information regarding infrastructure, socio-economics, environment, special places and heritage. Attendance was approximately 65 people.
Porter Creek Walking Tour	16 Sept. 2006	City of Whitehorse planners and several consultants were joined by approximately 20 community members in order to identify the trails and special places on the Porter Creek Bench
Community Open House	24 Oct. 2006	Hosted by the City of Whitehorse and the Porter Creek Community Association with the purpose of giving initial opportunity to those likely to be affect by the increased traffic and demand on local resources to express views and concerns.
Stakeholder Meetings	Several in the weeks leading up to the Charrette	The City of Whitehorse and consultants met with land owners, Kwänlin Dun First Nation, Ta'an Kwäch'än Council, YTG departments, Porter Creek Community Association, Real Estate Association, Whitehorse Chamber of Commerce, Yukon Conservation Society, Klondike Snowmobile Association, Horse and Riders Association, RCMP, and Main Street Yukon Society. These meeting were used to disseminate and garner information for the upcoming Charrette.
Visits to Local Schools	Several in the weeks leading up to the Charrette	Staff from the Planning and Development Services Department made presentations at local schools for a variety of classes and grades. These classes then created their own concept of what they would like to see in Whistle Bend. These concepts were on display at the Charrette.

3.2 2006 Design Charrette

The City of Whitehorse Planning and Development Services Department organized the Whistle Bend Charrette with in conjunction with the Canadian Mortgage and Housing Corporation (CMHC), the Government of Yukon (YG), and the Yukon Housing Corporation (YHC). The Charrette was held from the 5th to the 9th of November 2006 at the Canada Games Centre with 70 participants taking part. Participants included stakeholders, interest groups, consultants, First Nations, Federal and Territorial Governments, the City of Whitehorse, and members of the public. The purpose of the Charrette was to begin the planning process to develop a "high level" concept for the Porter Creek Bench lands, while simultaneously garnering interest and support for the project. The results of the Charrette became the guiding principles for the future subdivision and all plans had to be consistent with the ideas that emerged.

Participation in the design Charrette is considered to have been reasonably representative of the general Whitehorse population. It is believed that most, if not all, environmental and socio-economic issues relating to Phase I and Phase II of the Whistle Bend development surfaced during the design Charrette. Mitigation measures of the environmental and socio-economic issues are embedded in the *Whistle Bend Master Plan*

concept approved by Whitehorse City Council on February 23rd, 2009. A precedent of intensive community engagement and consultation was set during the Charrette, which became the benchmark for the entire consulting program that was to follow. This included the steering committee, working groups, community café, and open houses, direct consultation with First Nations and land owners, and a variety of internet-based methods.

The success of the Charrette can be seen through outside recognition, as it received an honourable mention at the 2008 Awards for Excellence in Planning hosted by the Planning Institute of British Columbia[1].

3.3 City of Whitehorse Plebiscite

On May 31, 2007 the City of Whitehorse held a citywide plebiscite which asked "Are you in favour of the Green Space Map developed for the Whistle Bend Community Concept located on the Porter Creek Lower Bench"? The draft greenspace map incorporated the results from the Charrette which held that approximately half of the total land area of the Porter Creek Bench would be set aside as protected green space, see Figure 3. The plebiscite returned an 83% "yes" majority.

[1] *More Information on this award can be found at http://www.pibc.ca/pages/awards-08.php*

Greenspace Concept Plan

Legend

- Significant environmental value
- Outdoor recreation (private)
- Protected greenspace
- Developable area
- Possible golf course expansion
- Proposed main trails
- Proposed central road network
- Existing trails

scale 0 500m

Greenspace Concept Plan

3.4 Working Groups

Following the completion of Charrette follow up documents, the City developed two working groups to assist in the creation of a Master Plan for Whistle Bend. The technical working group was made up of officials from Municipal and Territorial Governments, as well as representatives from the utility companies, and the Ta'an Kwäch'än Council. The community working group consisted of a range of members of the public, and interest groups, such as the Horse and Rider Association and Mountain View Golf Course. The working groups met on a number of occasions in order to provide the consultant team with feedback as the design process evolved. This included a meeting in June 2008 to discuss the Sustainability Indicators to be used, a meeting in September 2008 to review the preliminary concept plans, and a meeting in October 2008 to review the revised concept plans prior to the Community Café/Open House event. A further meeting in January 2009 reviewed the draft *Whistle Bend Master Plan* concept, as well as discussing the preliminary phasing, lot layout, and zoning regulations

3.5 Whistle Bend Housing Study

In lead-up to the October 29, 2008 Open House and Community Café, the City of Whitehorse commissioned Datapath Systems to undertake a survey of Whitehorse residents. A total of 199 Whitehorse residents participated in the survey during the period October 4 to October 9. Survey participants were asked to indicate their preferences regarding features for a new residential development in Whitehorse. Features that were most important to survey respondents included:

- energy efficient homes;
- homes with close proximity to greenbelt areas;
- new design standards that encourage sustainability (less impact on the environment); and
- attractive streetscape design (sidewalks, narrow roads, trees along roads).

Each of these concerns has been incorporated into the design for Whistle Bend at the neighbourhood and subdivision design level.

3.6 Open House and Community Café

There were two open houses held by the City of Whitehorse over the course of the *Whistle Bend Master Plan* development process. The first was held on October 29th, 2008 at the Old Fire Hall to present the three concept plans and to receive feedback on the preferred elements of each. This first open house was immediately followed that evening by a community café where participants were encouraged to move from table to table and openly discuss a variety of topics regarding different elements of the three plans. Topics included land use, design and layout, infrastructure, parks and greenspace, and community. Thirty members of the public attended the open house and were joined by an additional thirty-three for the community café.

At the end of the evening each participant was given the opportunity to vote on the elements they liked and did not like on each of the three concept plans. Everyone was given an electronic voting device which reported back on the group's response to a variety of questions in real time. Survey results were tabulated immediately and presented back to the participants at the end of the evening[2].

A second open house was held three months later on January 20th, 2009 at the Old Fire Hall to present the results of the final *Whistle Bend Master Plan.* The plan presented by the City of Whitehorse and consultants incorporated the feedback received from the first open house, community café, and other processes. Over 60 people attended the event.

3.7 Direct Consultation

3.7.1 Land owners and lease holders

Land owners and leaseholders within the Study Area were each met with directly for discussion beyond being invited to the large group consultation events such as the Charrette, and open houses. The City and the consultant team met with the Heiland family, as well as NavCan, CBC, and the Horse and Rider's Association. The City and Yukon Government have been working with CBC, NavCan and the Horse and Rider's Association to identify appropriate relocation opportunities.

3.7.2 First Nations

Both the Ta'an Kwäch'än Council and Kwänlin Dun First Nation have land interests within or adjacent to the Whistle Bend Study Area. The Ta'an Kwäch'än Council owns an area of Category B Settlement Land (C-9B) located within the limits of the *Whistle Bend Master Plan*. Although this property is outside the footprint of phases 1 and 2 development the concepts being used will apply to all phases and therefore input was sought and received from the Council.

The Kwänlin Dun First Nation's Settlement land is outside the limits of the completed Whistle Bend Study Area. Although there will be no direct impact on Kwänlin Dun lands as an adjacent land owner their input was sought and received.

The consultant team met with the First Nations on several occasions throughout the design and development stages to obtain feedback and direction.

[2] *The complete set of survey results can be found at http://ww3.whitehorse.ca/Planning/bench/Community%20Cafe/Community%20Cafe%20Voting%20Results.pdf.*

Table 2. Schedule and Objectives of First Nations Consultation

Date	Objective
Ta'an Kwäch'än Council	
18 June 2008	Introduction to project and review of sustainability indicators
1 August 2008	Conducted a teleconference with the planning team
23 September 2008	Review of preliminary concept designs with the planning team
28 October 2008	Review of final concept plans with the planning team
19 January 2009	Review of the revised preferred plan
Kwänlin Dun First Nation	
14 May 2008	Meeting with KDFN staff to introduce project
23 September 2008	Review of preliminary concept designs with the planning team
19 January 2009	Review of the revised preferred plan

3.8 Internet Consultation and Feedback

The internet was also utilized as a tool for garnering interest and dispersing timely information to the public about Whistle Bend. The City of Whitehorse dedicated a page of their website to solely provide information on Whistle Bend to the public. The site was updated regularly with information and background reports produced by the consultant team that highlighted the key components of the project, such as sustainability, geotechnical, archaeology, bylaws, and the *Whistle Bend Master Plan*.

The City also used their email subscription list, as well as participant lists from each event to send notification of upcoming events and dates for the Whistle Bend planning process.

Other means of disseminating information about the project included a YouTube video and an open-access Google group. These two sites provided an alternate forum for expressing ideas and opinions.

3.9 Council Approval Consultation

The *Whistle Bend Master Plan* was adopted by City Council on February 23rd, 2009. The City sent notification of this event to adjacent landowners, and those previously involved in the process. Several people appeared in Council regarding the *Whistle Bend Master Plan* adoption.

Zoning approval for Phases I and II of Whistle Bend took place on July 27th, 2009. As part of this approval, 202 letters of notification were sent to adjacent landowners, First Nations, the working groups, and other previously involved groups or individuals. No one appeared to speak at the public hearing and one submission was received in opposition to this amendment. The City addressed the concerns raised.

Phases I and II of Whistle Bend received subdivision approval on August 24th, 2009. The City published notification for this event in the City Pages of both local newspapers.

4. Project Description

For the purposes of this assessment, the Project is defined as those components and activities, both on-site and off-site, which comprise of Phases 1 and 2 of the overall *Whistle Bend Master Plan*. The scope of the project was developed in consultation with the Whitehorse Designated Office of the Yukon Environmental and Socio-Economic Assessment Board. The on-site and off-site servicing is based upon an estimated population and build-out, and an assumed rate of build-out for these two Phases.

The percent build-out is a function of estimated population growth, and has been established to relate the necessary off-site servicing needs to the anticipated population growth. Phases 1 and 2 have an estimated population of 2640, (assuming 1100 units constructed and a density of 2.4 people per unit). This represents approximately 25 - 30% of the total population at the completion of build-out of the entire *Whistle Bend Master Plan,* estimated between 8,500 and 10,000 residents. The on-site and off-site infrastructure required to support Phases 1 and 2 is based upon this assumption.

A summary of the on-site and off-site activities involved for Phases 1 and 2 can be seen on Figure 4.

4.1 On-site Facilities

The on-site activities include the site preparation (including Firesmart fuel reduction for removal of deadwood in the subdivision), legal survey of lots and roadways, and all the typical services including roads, water and sewer services; storm water retention areas. The site that was used by Navigation Canada will be included in Phase 1 development. Restoration of this site is scheduled for August 2010, after which time the site will be transferred to the Yukon Government. Restoration activities will include demolition and removal of existing buildings (NDB/Transmitter Building, transmitter antennas, and Radio Range Building), soil testing around the footprint of buildings to identify any soil contaminants and clean up of any debris on site. The contaminated materials that were identified in 1998 have been removed from the site and disposed of (including hydrocarbon contaminated soil, metal debris and contaminated soil; transformer oil) as documented in a report entitled *Site Restoration Non-Directional Beacon (NDB) Sites Dawson and Whitehorse. YT, EBA Engineering, March 2001.* The small amount of asbestos contained in a stovepipe in the Radio Range building will be removed when the building is dismantled and disposed of properly.

In addition, the on-site activities will include development of a range of recreational features such as pedestrian corridors, parks, trails, walkways (see Figure 5). Phases 1 and 2 will encompass an area of approximately 49 ha which includes roads and greenspaces. The proposed breakdown of land uses for each phase is as follows:

Phase 1

- 93 single family lots
- 8 duplex lots
- 9 multiple family lots
- 1 commercial lot
- 1 family park lot

Phase 2

- 101 single family lots (20 larger Restricted Residential lots)
- 26 duplex lots
- 48 townhouse lots
- 8 multiple family lots
- 1 community use lot
- 2 family park lots

4.1.1 On-site Drainage/Stormwater Management Considerations

Recommended drainage strategies are intended to achieve a post-development zero net increase in run-off from the site and is supportive of sustainability principles. Generally, the Whistle Bend site has favourable drainage characteristics and strategies incorporating infiltration will be utilized to reduce the run-off from the site by development and roadways by approximately 50% and 30% respectively. Minor and major systems will still be required on-site to handle the additional run-off that will be directed via piped systems and bioswales to detention facilities. These systems would also serve as a back-up to the infiltration systems that would be affected when the ground is frozen and snow melt must be conveyed away from the site. Water quality enhancement will also be provided with these infiltration/retention systems. There will be no discharge into the Yukon River. For Phases 1 and 2, smaller detention ponds designed to infiltrate will be built in each development phase. There is also a run-off retention facility that will be constructed in the form of a natural-looking storm water retention facility and not a traditional retention pond in order to preserve the vegetation in the area. This will be located between the two phases as well as 250 m of engineered bioswales in order to handle storm water.

4.1.2 Utility Corridor and Sanitary Lift Station

The subsurface infrastructure to be installed within a planned utility corridor will include communication lines, electrical lines, drainage works, sanitary and sewer, water distribution piping, and a possible district energy system. Figure 5 shows the location of the utility corridor. The utility corridor will follow planned roads and recreational paths throughout the development footprint. The corridor will be cleared initially, though not fully developed as a road, in order to provide access for the main subsurface infrastructure.

A sanitary lift station for wastewater will be constructed near the perimeter of Phase 2 development footprint to serve the first two phases of development, and could be used to serve further areas in the future. The onsite route of the waste water force main being installed to tie the lift station to the off-site Porter Creek Flush Tank will follow a series of planned recreational trails within the development footprint.

4.1.3 Other Standard Subdivision Servicing

In addition to the utility corridor and stormwater management facilities that will be developed on-site, typical subdivision activities including wastewater servicing, water servicing, roads and street servicing for the individual lots will be provided. The streets have been designed at a narrower width than the standard street-width to reduce the total area of asphalted surface, thereby achieving reduced stormwater and

snowmelt runoff in the subdivision as a whole. The subdivision has been sized in such a way to allow for the development of a future district energy system, should this be included at a later stage in the overall planning of the Whistle Bend neighbourhood.

A Firesmart fuel reduction plan for the subdivision will be implemented during the construction phase, in order to reduce the amount of deadwood in and near the subdivision. This will reduce the potential fire hazard in the neighbourhood.

4.2 Off-Site Facilities

The off-site activities include new or upgraded infrastructure required to support Phases 1 and 2, including transportation, water servicing, and wastewater disposal facilities. Specifically, the off-site components include:

- Whistle Bend Way – a 2-lane connector Road between Range Road and Mountain View Drive (approx. 600m);
- Range Road upgrades and multi-plate culvert replacement at McIntyre Creek (in conjunction with trunk water main upgrade and extension to Phase 1 & 2);
- Expansion of the existing Valleyview Water Reservoir with the addition of 2 cells;
- Extension and upgrade of the existing trunk water main along Range Road, from the Northlands Trailer Park to the site;
- A new Sanitary Force Main from the perimeter of the site to the existing Porter Creek Flush Tank (approx. 550m)

Access into the new neighbourhood will be via a new 2-lane connector road (Whistle Bend Way) that provides road access to the site from Mountain View Drive. Water will be delivered via an extension and upgrade of the existing trunk main along Range Road, and the sanitary flows from Whistle Bend will be transported by an on-site lift station and new sanitary forcemain to be connected to the existing Porter Creek Flush Tank. From there, sanitary wastewater is directed to the City's Livingston Trail Environmental Control Facility (LTECF) on the northeast side of the Yukon River. The total footprint of the off-site components is approximately 4 ha.

4.2.1 Water Servicing

The off-site components were modelled and designed with the same sustainable objectives and consultation processes that guided the on-site concept plan. Water consumption was one of the key components where pre-emptive action was taken to create a community that was focused on sustainability. The concept design set an average water consumption target of 375 litres per capita per day (lpcd), which is below the City's target of 500 lpcd and significantly below the current water consumption of Porter Creek of 690 lpcd. The model used to establish the necessary infrastructure to supply Whistle Bend was based on a reduced consumption rate that would be phased in over the first 10 years. The rate of water consumption is designed to start at 500 lpcd and gradually brought down to the targeted consumption rate of 375 lpcd.

The following water servicing activities that are within the scope of this assessment include:

- A water trunk main will be extended along Range Road within the existing road right-of-way between Northlands Trailer Park and the site. This extension will cross McIntyre Creek, and be constructed at the same time as the replacement of the McIntyre Creek culvert at Range Road.

- Two 5000 m^3 storage cells will be added to the existing Valleyview Water Reservoir. Valleyview reservoir is situated on a City-owned, 2ha lot of which approximately 0.35 ha is already developed for water storage cells. Minimal land clearing within the existing lot will be required for the additional cells.

In addition to the above, an additional pump will be added to the existing Two Mile Hill the booster station.

4.2.2 Wastewater

The plan for Whistle Bend sanitary flows is that they will be piped to the LTECF. These existing lagoons and headworks have the capacity to manage the additional flows. Also, the Porter Creek Flush Tank and gravity force main have sufficient capacity to handle the additional flows until 75% build-out, well beyond Phases 1 and 2. As shown on Figure 5, there are two activities required to supply the necessary waste water services to Whistle Bend in Phases 1 and 2, namely:

- A new sanitary pump station capable of 125 l/s will be constructed on-site; and
- A 350m force main with a minimum diameter of 450mm connecting this new pump station to the Porter Creek Flush Tank must be installed (approx. length 550m).

4.2.3 Transportation

The vision for Whistle Bend was to provide a safe and efficient transit system that connects the subdivision to the rest of the City. Public transportation transit lines are undergoing a complete reconfiguration over the next two to three years; any change is subject to public consultation, direction and approval by Council. The new system will be designed to incorporate the phasing of Whistle Bend in such a way as to reduce traffic and help support the goals of sustainability and encourage people to use the bus rather drive individual vehicles.

A bike trail connecting Whistle Bend has been planned to encourage sustainable transportation in the early phases of development. This trail will be a 3m wide asphalted trail running parallel with Mountain View Drive to the Range Road intersection. A short 400 m section of this trail will generally follow an existing trail except where more suitable grades are required. Also a large network of existing paths and trails for walking and biking in the Whistle Bend neighbourhood will be maintained or upgraded.

Transportation development activities that are required support the initial two phases include:

- Construct a two-lane connector road (Whistle Bend Way) from the entrance to the neighbourhood to Mountain View Drive (approx 600m new road assuming a 40m right-of-way);
- Replace the McIntyre Creek culvert on Range Road to coincide with the upgraded water main.
- Establish a new, 3m-wide asphalted bike trail along Mountain View Drive to the Range Road intersection

In addition to these activities, improvements to intersection geometry and signals may also be required in key locations. These minor improvements are not considered within the scope of this assessment.

Imagery from Yukon Government

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Legend

- Master Plan Footprint
- Phase 1 and 2 Boundaries (appears white)
- Storm Water Feature
- 300Ø Forcemain
- 350Ø Water Trunk Main
- Roadway Construction and Improvements
- Culvert Upgrade

Whistle Bend Project Phase 1 and 2: On-Site and Off-Site Activities

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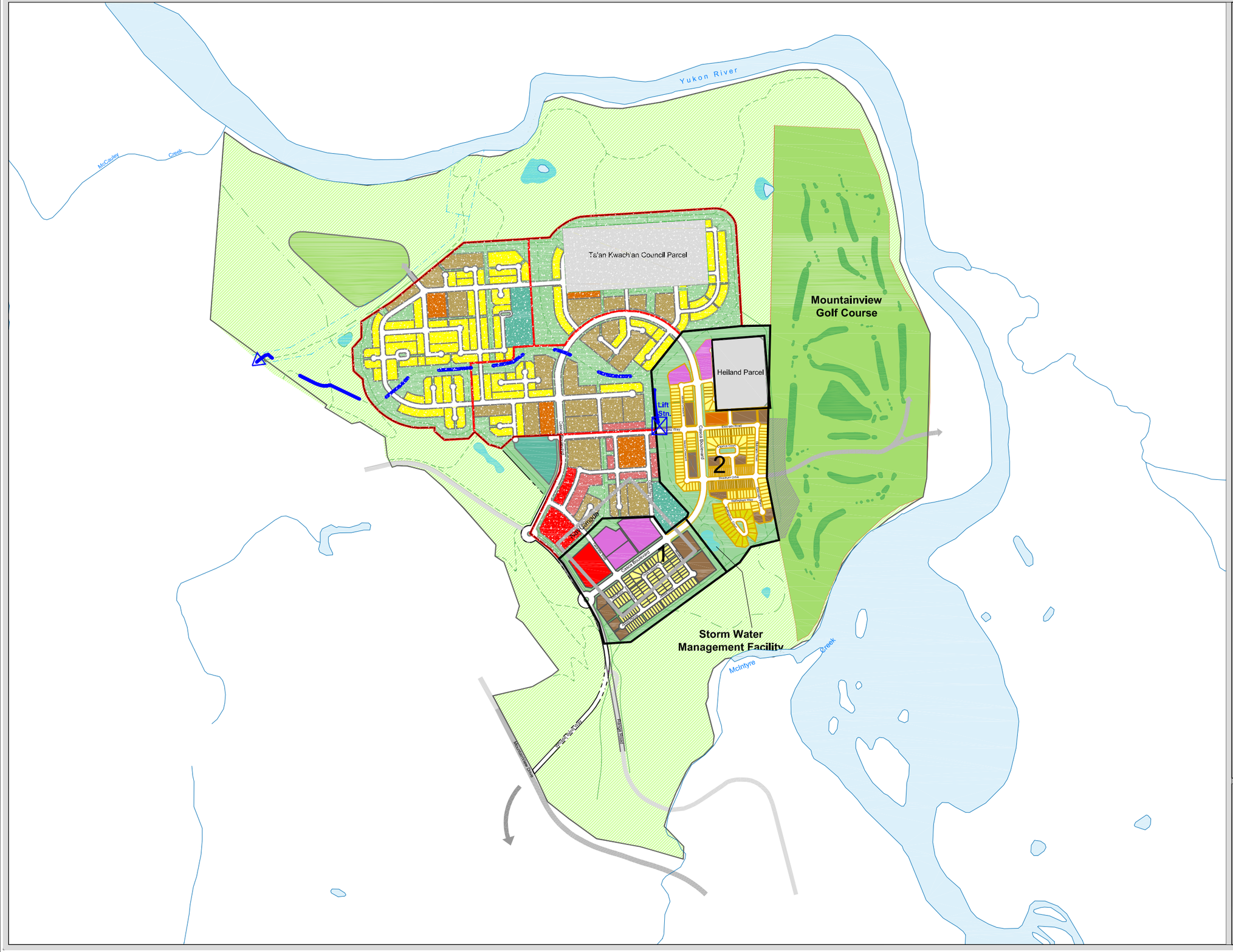
Project 108010

AECOM

Figure 4

Map Document: (S:\GIS_Proj\y2008\80498-108010_WhistleBend\MXD\108010_WhistleBend_Figure1_rh_30Sept2009.mxd)



Phase 1 and 2 Legend

- Single Family
- Large Lot Single Family
- Townhouse
- Multiple Family - Low Density
- Multiple Family - High Density
- Forcemain
- Trails
- Phase Boundary

Map Sources / Notes:
Map compliation and prduction a collaboration between City of Whitehorse, Planning Department and AECOM

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Reviewed by:	Initials	Prepared by:	RH
Date Issued:	3 Nov 2009	Project Number:	108010

City of Whitehorse

Whistle Bend Project Phase 1 & 2: On-Site Component

AECOM

Figure 5

Date Plotted: November 4, 2009 File Location: W:\GIS\GIS_Proj\Y2008\80498-108010_WhistleBend\CAD\Updated_WhistleBend_MasterPlan_v2_28Oct2009.dwg

5. Existing Environmental and Socio-Economic Conditions

5.1 Whistle Bend Study Area

Figure 6 shows the overall Whistle Bend Study Area, and the location of Phases 1 and 2 within this broader area. The Study Area encompasses all of the area on the Lower Porter Creek Bench that potentially would be affected by direct and indirect effects of the on-site components of the Project. In addition, the off-site facilities required for Phase 1 and 2, while not strictly encompassed within the Study Area, have been considered, particularly in relation to potential socio-economic effects such as traffic, and effects on existing users of the Study Area. The footprint of the on-site components of the Project encompasses approximately 7% of the total Study Area. The footprint of the off-site components is approximately 4 ha.

5.2 Climate

5.2.1 Wind Patterns

A wind patterns study on the Lower Porter Creek Bench was conducted by G.J. Bull & Associates (2005) with the following results:

a.) low average wind speeds, classified as “calm” and “light air”;
b.) typical wind direction ranged between SSW and ESE;
c.) wind speeds remained relatively constant over the year;
d.) peak wind speeds seemed to correlate to peak temperature over the period of a day

Low wind speeds on the Lower Porter Creek Bench are a result of the topography of the area. The wind blows down the narrow river valley corridor, which starts to widen near Grey Mountain and causes slower winds (GLL, 2006).

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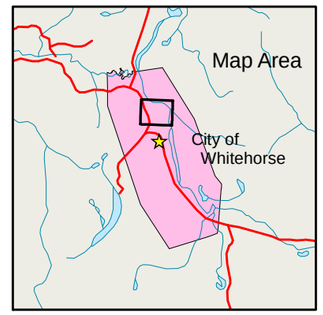
Phase 2

Phase 1

Legend

- Bench Study Area
- Road
- Trail
- Phase 1 and 2 Boundaries (appears white)



Base data acquired from the City of Whitehorse at 1:20,000 scale. Trail mapping conducted by Gartner Lee Limited.

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Whistle Bend Study Area & Existing Trail Network

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Figure 6

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5.2.2 Precipitation

The precipitation that the Whistle Bend Study Area receives is expected to be the same as the Whitehorse Airport, due to its close proximity. Overall the area receives low amounts of precipitation. The majority of run-off occurs in April, which is also the month that has the least amount of precipitation.

5.2.3 Thermal Inversions

The Whistle Bend Study Area is in the Yukon River Valley and therefore at a lower elevation to much of the surrounding area. An effect caused by this area of lower elevation is that frequent thermal inversions occur, where denser cool air settles over the bench overlain by a warm air layer. Thermal inversions can be sustained for long periods of time when combined with the low wind speeds typical of the Whistle Bend Area. This combination of temperature stratification and low speeds inhibits atmospheric mixing and can lead to pollutants collecting near the ground. The microclimate studies conducted by G.J. Bull & Associates (2005) found that the Whistle Bend Study Area experienced thermal inversion for greater than 70% of the days in a month for an average of eight hours a day (GLL, 2006).

5.2.4 Ice Fog

Ice fog occurs in pockets of lower elevation on the Yukon River, such as the Whistle Bend Study Area. It occurs when water vapour mixes with very cold air, usually at temperatures that exceed -35 degrees. Ice fog can happen naturally but can also be caused by other sources such as emissions from vehicles (GLL, 2006).

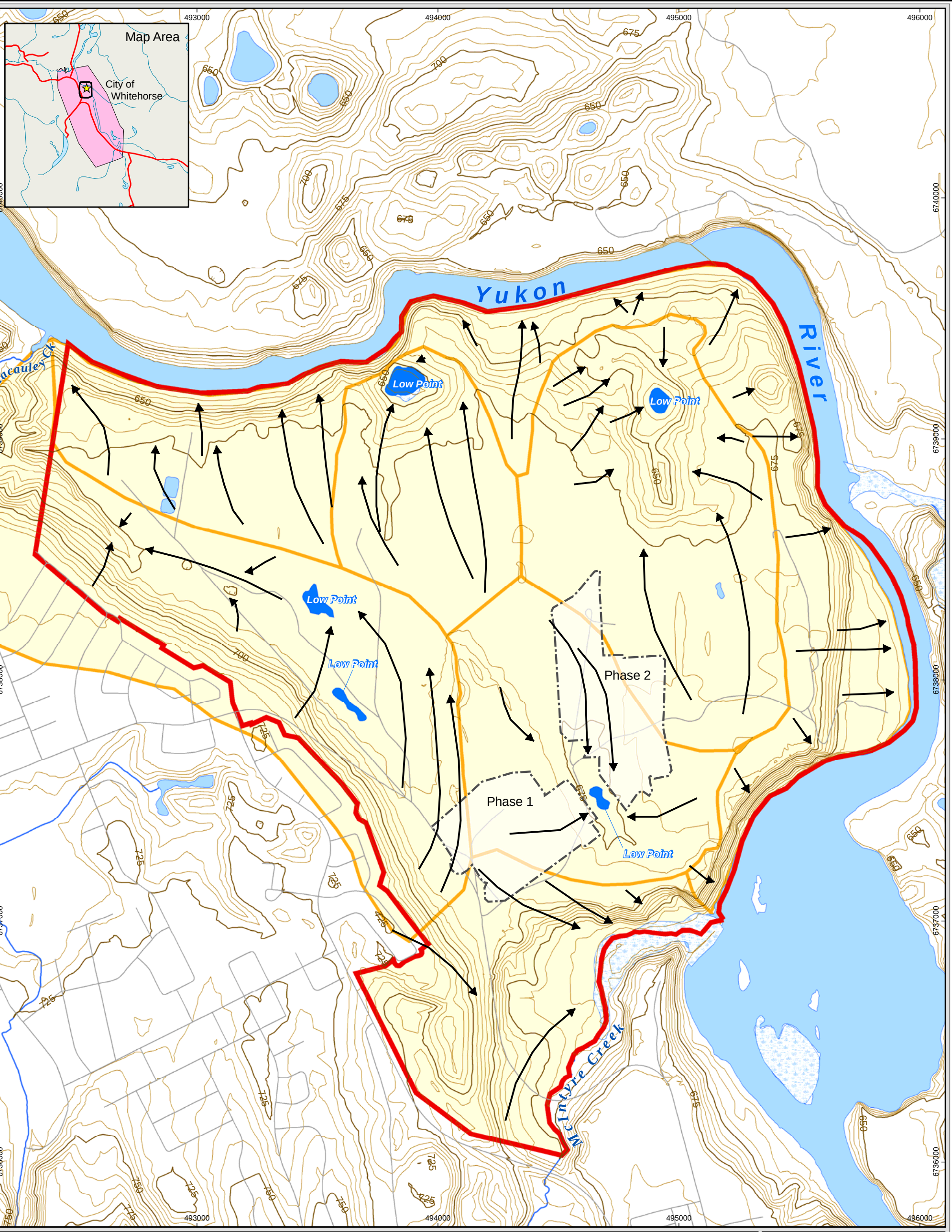
5.2.5 Air Quality

An on-going air quality concern brought up through consultation within the Whistle Bend Study Area has been the issue with odours. Two sources have been identified as causing the problem. The first is from nearby wastewater treatment lagoons and the second is from wood smoke from existing household fireplaces and wood stoves (G.J Bull & Associates, 2005). Both problems are a result of the natural conditions of air inversions and low winds discussed above which inhibit mixing of pollutants (GLL, 2006).

5.3 Water Resources

5.3.1 Surface Drainage

The Whistle Bend Study Area has been divided into six discrete watersheds, which can be seen on Figure 7. There are five separate low spots within these watersheds which function as surface water run-off receiving points, particularly during spring thaw and high rain events (AECOM, 2009). There are no clear drainage gullies within the Study Area due to the gentle slopes of the area and pervious soils. Approximately 15% of the Whistle Bend Study Area drains directly into the Yukon River, while the remainder drains into McIntyre Creek and Macaulay Creek. Both of which ultimately drain into the Yukon River. The mouth of McIntyre Creek is on the southern edge of the Study Area the mouth of Macaulay Creek is in the north-western corner. There are signs of a seasonal stream in the ravine in the northwest end of the Study Area near Macaulay Creek.



Base data aquired from the
City of Whitehorse at 1:20,000 scale.
Drainage basins delineated by Gartner Lee Limited

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Legend

- Drainage Direction
- Watercourse
- Road
- Contour (20m)
- Contour (5m)
- Bench Study Area
- Drainage Sub-Basins
- Phase 1 and 2 Boundaries
- Waterbody
- Wetland

Whistle Bend Project: Existing Drainage Pattern

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Project 108010

AECOM

Figure 7

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5.3.2 Groundwater

The thick layer of silt and clay present within the Study Area results in very little groundwater flow and limits recharge under the site. It is more likely to be present as a shallow system in the sand above the clay or at depth in the underlying bedrock. Bedrock is estimated to be around 100m below ground surface.

Drainage from Porter Creek flows into Hidden Lake, which does not have a surface outlet but instead infiltrates into the ground. It is probable that this groundwater flows into the ravine on the northern end of the study area. This is supported by the fact that the bank of Yukon River in this corner rarely freezes and several seeps have been recorded in this area during the winter.

There is one private operational well within the Whistle Bend Study Area belonging to the Heiland family. It is located in the middle of the study area and was drilled to bedrock at 117 m. It has a water level of 28m below surface, which is higher than Yukon River.

5.4 Terrain and Vegetation

The Whistle Bend Study Area is a glaciolacustrine terrace that is thinly overlain with glaciofluvial deposits (GLL, 2006). Two types of aeolian deposits lie on top of these primary deposits. The first is loess; a very thin layer of silt deposited by winds that were driven by large changes of temperature. The wind picks up loose material left by the glacier and deposits it in large, well sorted blankets. The second is sand dunes, which are made up of well-sorted fine to medium grained sand and tend to have a crescent shape pointing downwind. A large one is found in the middle of the bench and is covered with spruce-feathermoss and pine-bearberry forest. Also, colluvial deposits have collected along the steep slopes bordering the study area.

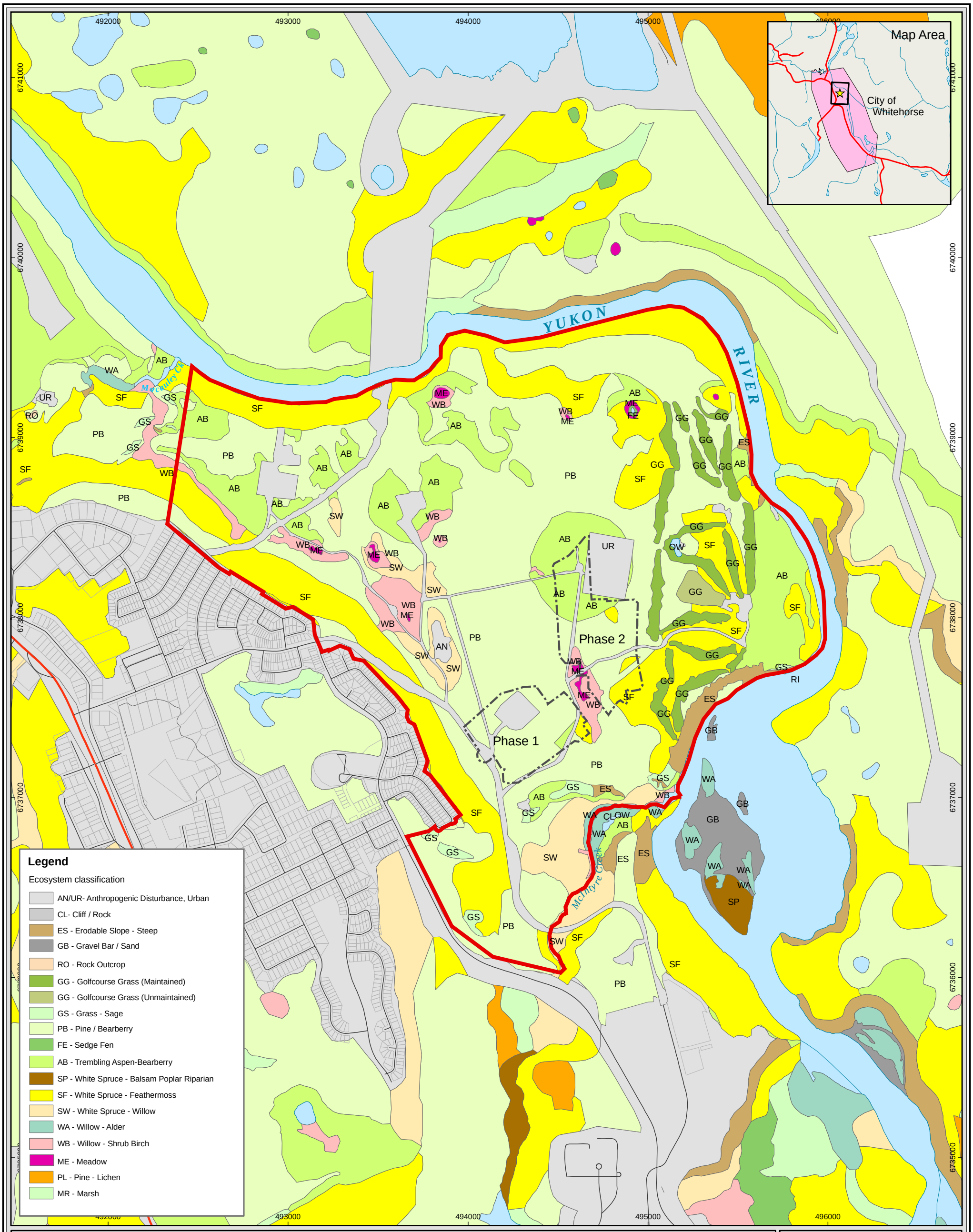
Several small, pothole depressions are present within the Study Area which are the remains of blocks of glacier ice that broke off and melted. Only one of these retains water throughout the open water season and is located within the Mountain View Golf Course lease.

There are three predominate forested ecosystems that cover the Whistle Bend Study Area:

- Pine-Bearberry;
- Spruce Feathermoss;
- Aspen Bearberry.

The distribution of ecosystems that are present within the Study Area can be seen on Figure 8.

Surrounding the McIntyre Creek area there is a variety of diverse ecosystems that vary from the typical ecosystems of the area. The entire McIntyre Creek corridor is considered to be a Significant Wildlife Area (SWA) and Environmentally Sensitive Area, as classified by a City of Whitehorse in conjunction with Applied Ecosystems Management, as seen on Figure 9. The small ravine in the north end of the Study Area has also been classified SWA, which gradually flows into a tributary of Macaulay Creek. The majority of the Whistle Bend Study Area was classified as low wildlife value and low environmental sensitivity.



Base data acquired from the
City of Whitehorse at 1:20,000 scale.
Ecosystem mapping conducted by Gartner Lee Limited,
at 5,000 and 20,000 scales.

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UTM Zone 8N, NAD 83

Legend

- Bench Study Area
- Phase 1 and 2 Boundaries
- Highway
- Road

Whistle Bend Project: Ecosystem Classification

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Figure 8

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Map Area

City of Whitehorse

YUKON RIVER

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Phase 1 Phase 2

HWLS

Wildlife Land Classes

- HS- High Environmental Sensitivity
- Moderate Environmental Sensitivity
- HWHS- High Wildlife Values, High Environmental Sensitivity
- HWMS- High Wildlife Values, Moderate Environmental Sensitivity
- HWLS- High Wildlife Values, Low Environmnetal Sensitivity

Base data acquired from the City of Whitehorse at 1:20,000 scale. Significant Wildlife Land Classes defined by Gartner Lee Limited.

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Legend

- Bench Study Area
- Highway
- Road

Whistle Bend Project: Valued Wildlife Habitat

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AECOM

Figure 9

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5.5 Wildlife Resources

Public consultation on the Whistle Bend Study Area reported that the northwest corner is used by waterfowl seeking first open water in spring (GLL, 2006). Lower McIntyre Creek has been identified as an area of interest by birders. Specific species identified in this area are:

- A diverse selection of waterfowl during spring migration, such as Tundra and Trumpeter swans, geese, Eurasian Wigeon
- recurring predators, such as Northern Harrier, Red-tailed Hawk, Gyrfalcon
- Townsend's Solitaire
- Mountain Bluebird
- Herring Gulls
- Mew Gulls
- Northern Shrike
- Glaucous and Glaucous-Winged Gull

Public consultation has also mentioned sightings of moose, bears, and coyotes within the Study Area.

5.6 Fish and Fish Habitat

Within the Whistle Bend Study Area, McIntyre Creek is the only fish bearing stream. Chinook salmon are known to spawn in the lower reaches of McIntyre Creek below Range Road. Juvenile Chinook salmon are currently limited from reaching further upstream by the perched culverts at Range Road; however, this culvert is not considered to be a complete barrier to upstream migration of adult salmon (GLL, 2006).

There are also a variety of freshwater fish that have been recorded in McIntyre Creek:

- Arctic Grayling
- Round Whitefish
- Lake Trout
- Long Nose Suckers
- Slimy Sculpin
- Burbot
- Rainbow Trout

Macaulay Creek, located in the northwest corner of the Whistle Bend Study Area, does not support any fish.

5.7 Land Status and Use

Land Status is shown on Figure 10. YG owns the majority of the land in the Study Area with the exception of 8 parcels. These parcels include:

1. Transport Canada (Lot # 465)
   Navigation Canada leases this 21 hectare parcel from the Government of Canada. There is a tower and transmitter located on the property which is currently used by the airport. This parcel is situated within Phase 1 of the Project; however, the tower and transmitter are in the process of being moved and the land is being transferred over to the Yukon Government.

2. Heiland property (Lot # 1139)
   The Heiland property encompasses an area of 8 ha, and is located adjacent to Phase 2 development. The owners have the option to develop the property within an undetermined timeframe, and will be able to hook up to the servicing being installed in the area. Any development of this property is outside the scope of this project, as it is privately owned land and therefore not within the scope proposed by the proponent of this project.

3. Ta'an Kwäch'än Council C-9B
   This 20 hectare parcel is located to the north of Phases 1 and 2, and is planned to be developed for housing and business opportunities in the future.

4. Kwänlin Dun First Nation C-43
   This 17 ha parcel is located southeast of Phases 1 and 2 developments, on the east side of the Mountain View Golf Course. Access to this parcel is currently through Phase 1 and 2 development area and the Mountain View Golf Course.

5. Mountain View Golf Course Lease #375 and 375A
   The Mountain View Golf Course currently occupies an area of 137 ha, and is held under lease to the Government of Yukon. The Golf Course is located along the eastern perimeter of Phase 1 and 2 developments. The Golf Course also holds another 52 ha lease that extends north-east along the Whistle Bend development area but is currently undeveloped land.

6. Canadian Broadcasting Corporation Lease (CBC) (Lot # 439)
   The CBC lease occupies 19 ha located to the northwest of Phases 1 and 2. CBC has been granted a three year extension to their lease until 2012 at which time they must vacate the lot.

7. Yukon Horse and Riders' Association (Lot # 1390)
   The Association leases a 6 ha parcel leased from the City of Whitehorse. This parcel is located to the west of the Phase 1 and 2 developments; however the proposed utility corridor will cross a small undeveloped corner of this parcel. The Association has identified the decommissioned Porter Creek lagoons as a possible alternative location, and are currently investigating the options for relocating their

facilities to this area. The timing of any relocation is uncertain at this time, and is not within the scope of this project.

8. Porter Creek Lagoons

The City of Whitehorse owns a 1 ha parcel that encompasses this small, 3-cell sewage lagoon, located in the northwest corner of the Study Area. The facility was decommissioned in 1996; however the sludge pit at this facility will require rehabilitation prior to future development of this area. The schedule for further rehabilitation of the facility has begun and will be completed to meet appropriate regulations; however this work is not within the scope of this project.

Imagery from Yukon Government

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Legend

- Roadway Construction and Improvements
- Culvert Upgrade
- Phase 1 and 2 Footprint (appears white)
- Master Plan Footprint
- Existing Land Disposition
- First Nation Settlement Land

Whistle Bend Project Land Status

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Figure 10

Map Document: (S:\GIS_Proj\y2008\80498-108010_WhistleBend\MXD\108010_WhistleBend_Figure1_rh_30Sept2009.mxd)

5.8 Recreational Use

The Whistle Bend Study Area is mainly used as a year-round recreational area, for activities such as dog-walking, skiing, bird watching, golfing, and motorized vehicles. Within the Study Area there is a fairly extensive existing trail network. This network of walking and recreational vehicle trails has been documented through input from local residents, a walking tour consultation event and field work by Gartner Lee Ltd in preparation for the Charrette. A map of these existing trails can be seen on Figure 6.

5.9 Cultural and Heritage Resources

Two heritage resource impact assessments were completed for the Whistle Bend Project by Matrix Research Ltd. These assessments involved an office review of air photos, contour maps, ethnographic and archaeological records, as well as historic information prior to the field work component, which involved transects and subsurface testing.

One assessment covered the Whistle Bend Study Area and Matrix identified three heritage sites within the development study area prior to completion of the *Whistle Bend Master Plan*. The results of this survey were taken into account by the planners and the footprint of the entire development will not impact the identified archaeological or cultural heritage resources. These sites have sufficient buffer areas established to provide appropriate protection.

A second assessment examined the Whistle Bend Way[3] area where Matrix identified three heritage sites and 10 culturally modified trees (CMTS).

5.10 Socio-Economic Conditions

A baseline report (*Porter Creek Bench Socio-economic Background Report*, *2006*) was prepared for use as reference material at the November 2006 Design Charrette. The report provides a comprehensive description of existing City of Whitehorse socio-economic conditions. A copy of the report may be found on the City of Whitehorse's website:

http://ww3.whitehorse.ca/Planning/bench/pcb_socio-econ_report.pdf

Data from the most recent national Census (conducted in May 2006) were released subsequent to the November 2006 Design Charrette. Descriptive data from the 2006 Census for the City of Whitehorse may be found on Statistics Canada's web site:

http://www12.statcan.gc.ca/census-recensement/2006/dp-pd/prof/92-591/search-recherche/frm_res.cfm?Lang=E

[3] *Formally referred to as the Whistle Bend Connector Road in the Matrix Heritage Reports, which can be found in the References Section of this report.*

6. Environmental and Socio-Economic Effects Assessment

6.1 Scope of the Assessment

At this time, the Government of Yukon and City of Whitehorse are seeking to develop only Phases 1 and 2 of the *Whistle Bend Master Plan*. This assessment will address the on-site and off-site components and activities that pertain directly to the first two phases. The remaining phases of development, including any off-site infrastructure developments and/or improvements, will be addressed in future assessment(s). Table 3 lists those activities that have been considered to be assessable activities, and are therefore included within the scope of this assessment.

AECOM

Table 3. Whistle Bend Project Assessable Activities

On-Site Activities	Assessable	Non-Assessable	Description/Comments
Phase 1 Development footprint boundary	x		gross area (roads/green included) = 19.6 ha; gross density (roads/green included) = 30 u/ha
Phase 2 Development footprint boundary	x		gross area (roads/green included) = 23.9 ha; gross density (roads/green included) = 20 u/ha
Remaining Land Use Area			including commercial, schools, community uses, etc.
Phase 1 & 2 Water utility corridors	x		tie-in locations yet to be determined
Phase 1 & 2 Wastewater utility corridors	x		tie-in locations yet to be determined
New Pump Station (125 l/s)	x		Whistle Bend sanitary pump station (125 l/s) constructed at 0% build-out
Storm Water Features	x		Phase 1 and 2 storm water management measures only
WB Paved Perimeter Trail	x		completion suspected to be post-Phase 2
NavCan Tower Relocation	x		property owned by Federal Government; (includes removal of DFO equipment on-site)
Horse and Rider Club Relocation		x	relocation to occur following completion of Porter Creek Lagoon decommissioning; not required for Phase 1 and 2
Decommissioning of CBC tower		x	property leased from Yukon Territorial Government (YTG); not required for Phase 1 and 2
Off-site Service Activities	**Assessable**	**Non-Assessable**	**Description/Comments**
Roadways			
Whistle Bend Connector Road	x		2 lane connecting Mtn View Drive and Range Rd @ 10%
Trail Networks			
Mtn View Bicycle Path	x		3m wide asphalted path running parallel with Mtn View Drive to Range Rd. intersection (0%)
Water Servicing			
Valleyview Reservoir	x		2 new 5000 m^3 cells added @ 0% build-out
Storm Water Management	x		minor and major systems required to handle additional runoff; directed via piped systems and bioswales to detention facilities
Trunk water mains			
i) from Northlands along Range Rd.	x		Extend existing 350mm on Range Rd with a 450mm to WB (0%)
Two Mile booster station upgrade		x	one pump added within the Two Mile Hill Booster Station Pumphouse at 0% build-out
Culvert Upgrades			
Range Road Culvert	x		replacement of culvert due to road widening (upgrade of trunk water mains) which will also enhance fish passage
Wastewater			
New Forcemain to PC flush tank	x		370m long 450mm forcemain from pump station to PCFT (0%)
Lagoons			
Porter Creek Lagoons		x	decommissioning of lagoons triggered since volume of material containing contaminants in excess of 3000 m^3
Livingston Lagoons		x	odour issue is a separate project and will not be assessed; proposed mitigation measures will be referenced if available
Separate Submissions			
YECL		x	separate YESA submission, granted Land Use Permit (YA91393)
NWTel		x	Tie-ins to Whistle Bend will be in conjunction with YECL access

6.1.1 Spatial and Temporal Scope of Assessment

The geographic scope of the biophysical assessment includes effects occurring within the Study Area as shown on Figure 6, as well as effects resulting from the construction and operation of offsite infrastructure that is included in the Project Scope, and are described in Section 2.3. The spatial scope of the socio-economic assessment incorporates the Study Area and also includes the Porter Creek neighbourhood. This broader area encompasses the area within which the majority of social and economic effects of the Project will be most evident.

This temporal scope of this assessment considers the effects of the Project during the construction and operations phases (the latter considered to occur at the completion of build-out of Phase 1 and 2). Effects associated with the abandonment phase are not considered here, as this phase is not relevant to projects that are intended to be operated in perpetuity, such as community developments.

6.2 Scope of Cumulative Effects Assessment

It was recognized at an early stage in the assessment process that the effects of the Whistle Bend Project will take place within the broader context of the City of Whitehorse – an urban area where extensive human development and disturbance has, and continues to occur. Residential, infrastructure, recreational and industrial developments have been ongoing for many years, and will inevitably continue into the future as the City develops and evolves. Development projects within the City boundaries are considered in the context of the City's Official Community Planning process, whereby changes to the Official Community Plan, including this Project, are considered, revised, and ultimately adopted.

The assessment of this Project does not intend to address the cumulative effect of all ongoing urban development within the City. Cumulative effects of projects such as Whistle Bend need to be, and have been, thoroughly considered through the municipal planning process, and not on a project-specific basis. Many of the issues that have been considered in the development of the *Whistle Bend Master Plan*, and that are reflected in the Project design of Phases 1 and 2, have incorporated solutions to issues that relate directly to cumulative effects in the context of the future planning of the City's residential neighbourhoods, as directed by the OCP.

The lands adjacent to the Whistle Bend Project, including First Nation Settlement Lands, titled property and leased lands could be developed during the Phase 1 and 2 Project. However, at this time, there is no specific information as to future development proposals for any of these parcels, and thus these potential future developments have not been considered in terms of potential cumulative effects within the Study Area. Such developments would be considered in conjunction with the Whistle Bend Project through both the City planning process and the assessment process at the time that specific development proposals are advanced.

6.3 Identification of Valued Ecological and Socio-Economic Components

The environmental assessment of the Project focuses on Valued Ecological Components (VEC's) and Valued Socio-economic Components (VSEC's). The VECs and VESCs were developed as an outcome of extensive consultation with key stakeholders, the public, agencies and planners. They include components that are valued for minimizing potential impact to the ecological integrity of the Study Area, and have social and/or economic importance. The VECs and VSECs evaluated in this assessment are as follows:

- Air Quality
- Soil and Terrain Stability
- Stable and Self-sustaining Vegetation Cover
- Protection of Rare Plants
- Wildlife Diversity and Habitat
- Surface Water Quality and Flows
- Fish Population Abundance and Diversity
- Fish Habitat
- Recreational Use
- Heritage Resources
- Existing Infrastructure and Services (Traffic; Protective Services; Schools)

Environmental and socio-economic effects can result from interactions between the Project activities described in Section 4 and the pre-existing biophysical and socio-economic conditions described and referenced in Section 5. The assessment of environmental and socio-economic effects identifies the potential interactions that could result in adverse effects, and describes mitigation measures that have or will be implemented to eliminate or reduce potential adverse effects.

The assessment of effects for the construction and operations phases of the Project are summarized in Tables 3 and 4, respectively. In general, the effects of subdivision projects are focussed on the temporary effects during the construction phase that are, for the most part, localized and of short-term duration. The operations phase is considered to be that period of time after the build out of Phases 1 and 2 is essentially completed, and all associated supporting infrastructure is in operation. These effects represent a permanent change to the environment, and are the outcome of an extensive planning and consultation effort over the past several years. To a very great extent, the footprint and design of the project reflects many features that reduce the permanent effects of the project on the existing natural and human environment.

6.4 Effects Assessment

Tables 3 and 4 identify the potentially adverse environmental and socio-economic effects of the Project, for both the construction and operations phases, respectively. The mechanism whereby the potential effect would occur is described, along with proposed measures to mitigate any potential adverse effects. Assuming the implementation of suggested mitigation measures to avoid or minimize potential adverse effects, an interpretation of the significance of any residual adverse effects is provided.

Table 4. Construction Phase

VEC/VSEC	Potential Effect	Mechanism	Mitigation	Significance
Air Quality	• Increased airborne dust may affect nearby properties and effects may extend to residential areas in Porter Creek	• Construction activity and heavy equipment transport may increase dust levels within Study Area	• Implement dust control measures as necessary during construction • Distance to borrow sources should be minimized, thereby reducing emissions through reduced frequency and duration of construction traffic.	• Not Significant • Construction effects are temporary
	• Increased levels of emissions may affect nearby properties and effects may extend to residential areas in Porter Creek	• Heavy equipment and vehicles will generate increased vehicle emissions within Study Area and along existing transportation routes • Smoke during on-site burning of brush from clearing of land will result in deterioration of Air Quality in Study Area and effects may extend to Porter Creek subdivision • Smoke during Firesmart removal and controlled burning of deadwood in the vicinity of the development	• Tree salvage – trees over 10 cm diameter will be cut to cord length and offered to the public from a central location within the Project Area. Removal of remaining slash and stumps will be burned in accordance with burning regulations on site. • Disposal of brush resulting from clearing of individual lots will be coordinated: a central area will be identified for disposal and controlled burning at appropriate times. • Burning during Firesmart program will be done through controlled burns at appropriate times and locations.	• Not Significant • Controlled burning in designated area on-site will minimize duration and frequency of smoke from burning; fire hazard will also be minimized.
Stable and self-sustaining vegetation cover	• Permanent removal of vegetation cover	• *On-site activities:* Land clearing during site preparation and lot development. Includes clearing for on-site utility corridor, roadways. • *Off-site activities*: Clearing of land for construction of Whistle Bend Connector Road	• Project design incorporates higher density of development, resulting in a reduced project footprint • Greenways incorporated into project design; • Design maintains vegetation diversity and avoids sensitive areas such as wetter sites; cliffs; natural depressions, etc); • By-law 2009-22 enacted to ensure retention of natural vegetation within RCS2 zoning. All single-family/duplex lots in Whistle Bend (excluding RR lots) are zoned as RCS2. • Revegetation/reclamation of utility corridor should be undertaken • Timber salvage where appropriate. Removal and burning of slash will be undertaken on-site in accordance with burning regulations.	• Not Significant • Planning and design retains areas of vegetation diversity. Timber retention will reduce the overall effects. No rare or unique vegetation communities affected.
Protection of Rare Plants	• Loss of rare plant species	• Rare plant species have not been identified within Project footprint	• None required.	• N/A
Soil and Terrain Stability	• Soil erosion and sedimentation of adjacent water courses	• Surface disturbance of areas prone to erosion (eg. cliffs above Yukon River; exposed soils) during construction	• Project design incorporates major setbacks from escarpment, eliminating the potential for increased bank erosion and resulting sedimentation of Yukon River. • Implementing standard seiment and erosion control measures, where warranted • Revegetation or stabilization of disturbed areas within one year of construction	• Not Significant
Surface Water Quality	• Increased sedimentation in Yukon River	• *On-site activities* resulting in surface disturbance (vegetation removal; erosion) contribute to direct introduction of sediment to Yukon River	• Project design incorporates major setbacks from escarpment adjacent to Yukon River, thus eliminating potential for direct surface runoff to these water courses. • All site drainage will be managed on site and directed to onsite water retention features, resulting in no increase in off-site surface water drainage	• Not Significant • Not Significant • Potential adverse effects will be avoided or minimized through appropriate application of DFO

VEC/VSEC	Potential Effect	Mechanism	Mitigation	Significance
	• Increased sedimentation in McIntyre Creek	• *Off-site activities*: • Replacement of Range Road culvert and associated works in and adjacent to McIntyre Creek may result in increased sedimentation of watercourse. • Whistle Bend Connector – construction of road may result in surface runoff containing sediment entering McIntyre Creek watercourse.	• Replacement of culvert will be in accordance with DFO's *Land Development Guidelines for the Protection of Aquatic Life.* Appropriate DFO *Operational Statements* in force at time of construction will also be followed to minimize potential effects on fish habitat at time of installation. • Surface runoff will be managed and directed away from McIntyre Creek using appropriately designed ditches, swales and cross-drainage to direct surface runoff.	guidelines. • Not Significant • Best Management Practices will be implemented to manage drainage during construction.
	• Potential hydro-carbon and metal contaminants transported to adjacent waterbodies (Yukon River and McIntyre Creek)	• Once buildings removed, the building footprint will be tested for potential hydrocarbon and metal contaminants. If found, the remnants of contaminated soil may contribute to contaminants entering adjacent water bodies. • Note that site has been remediated, but remaining building will be removed prior to construction of Phase 1.	• Further soil samples of building footprint will be taken as soon as building removal is complete to ensure no residual contamination remains. If any contaminated soils are detected, these will be excavated and removed from the site and properly disposed of. • Site clean-up was initially completed by EBA in 2001. Testing identified small amounts of contaminated soils that were excavated. Sampling results confirmed that affected soils were removed from the site. No further cleanup is required for the site.	• Not Significant
Surface Water Flows	• Change in surface flows	• *On-site activities* will not result in changes to flows as no works are planned in or near water courses on site. • *Off-site activities* include culvert replacement on McIntyre Creek. This activity will result in a temporary diversion of flow during installation period.	• Project design (location) avoids surface water features. • Construction timing window and methods will be in accordance with advice issued by DFO. Design of culvert will result in improved potential for upstream salmon migration.	• N/A • Not Significant
Fish Population Abundance and Diversity; and Fish Habitat	• Direct loss of fish and riparian habitat	• *On-site activities: No direct effects* • *Off-site activities:* Range Road culvert replacement may result in loss of fish and riparian habitat	• None required; No fish habitat on-site • Replacement of culvert will be in accordance with DFO's *Land Development Guidelines for the Protection of Aquatic Life.* Appropriate DFO *Operational Statements* in force at time of construction will also be followed to minimize potential effects on fish habitat at time of installation.	• N/A • Not Significant • Any effects on habitat would be localized and temporary
	• Indirect loss of habitat due to increased sedimentation	• Surface drainage/increased sediment entering McIntyre Creek during construction of Whistle Bend Connector may result in deterioration of fish and riparian habitat.	• Surface drainage will be controlled during construction such that any runoff will be directed away from McIntyre Creek. Best Management Practices will be implemented to address erosion and sediment control where warranted.	• Not Significant • BMPs will minimize adverse effects associated with sedimentation of watercourse.
Wildlife Diversity and Habitat	• Direct loss of wildlife habitat	• Permanent removal of vegetation will result in some permanent loss of wildlife habitat	• Project design avoids areas identified as high value for wildlife habitat, as shown on Figure9. • Reduced project footprint minimizes permanent loss of vegetation/wildlife habitat	• Not Significant • Areas of high value for wildlife have been avoided through Project siting and design.
	• Displacement of wildlife	• Disturbance during construction will result in temporary displacement of wildlife	• Displacement of wildlife minimized by avoidance of higher value areas; some displacement unavoidable	Displacement of wildlife during construction phase will be temporary.

VEC/VSEC	Potential Effect	Mechanism	Mitigation	Significance
Recreational Use	• Loss/disruption of short sections of existing bush trails • Reduced aesthetic values (visual, tranquility, solitude)	• Direct loss of sections of trail network as result of on-site development activities. • Increased noise and disturbance will reduce recreational aesthetic values	• Project design avoids majority of trail network and incorporates greenways to maintain thoroughfares through the development, as shown on Figure 6. Where necessary, trails will be relocated. • Project design in conjunction with May 2007 Plebiscite and *Master Plan* Approval ensured that 50% of WB Study Area be maintained for recreational purposes(including greenspace) • Disturbance associated with construction is temporary	• Not Significant • Majority of existing trail network is maintained. Disruption of recreational use during construction is temporary and unavoidable.
Heritage Resources	• Loss of heritage resources	• Land clearing and disturbance associated with on-site and off-site activities may result in permanent loss of known heritage resources	• On-site activities avoid known sites (identified through survey of Study Area) • Off-site activities potentially impact one known site; reclamation and salvage will be carried out prior to construction of the Connector, and in accordance with required Salvage Permit.	• Not Significant • Complete salvage of all affected sites will be undertaken prior to construction.
Traffic	• Disruption and disturbance of nearby landowners due to increased noise levels and possibly traffic congestion.	• Increased construction traffic on-site and off-site	• Strict observance of all traffic rules and regulations to reduce potential for accidents • Scheduling of works to minimize effects (hours of day to avoid peak traffic periods; shutdown during evening/night).	• Not Significant • Implementation of mitigation will reduce, but not eliminate effects during construction. However, these effects will be localized and temporary.

Table 5. Operations Phase

VEC/VSEC	Potential Effect	Mechanism	Mitigation	Significance
Air Quality	• Increased levels of emissions may affect nearby residential areas in Porter Creek	• The long-term effects of residential expansion include increased levels of traffic and associated increase in vehicle emissions. • Utilization of wood stoves for home heating will contribute to poorer air quality	• Project designed so that majority of lots are within 5 minutes walk of public transit (bus loop). Density increased to make public transit more viable and reduce dependence on private vehicles. • City completed traffic model to identify future traffic conditions resulting from residential growth in the City. Optimal traffic and transit solutions will be identified for the City, and are beyond the scope of this Project. Ongoing efforts by City Planning and Engineering will ensure that traffic-related effects of the project are minimized through the application of optimal planning solutions. • Application of City By-law for clean burning woodstoves; • Energy efficiency requirements of City's new building code reduces energy consumption and therefore less wood burning and associated emissions will be produced	• Not in Project Scope
Soil and Terrain Stability	• Soil erosion and sedimentation of adjacent water courses	• Increased human use (particularly motorized use) along escarpment, resulting in erosion of escarpment.	• Develop trails that are removed from escarpment. Restrict motorized access. • Develop O*ut and Away* trail plan to guide motorized use where appropriate • Monitor erosion along escarpment, as required • Current zoning of area is PE – Environmental Protection. This zoning allows very limited uses, including limited or no motorized use.	• Not Significant
Surface Water Quality	• Increased contaminant levels in Yukon River	• *On-site* development: Contaminated storm water runoff directly entering Yukon River • *Off-site activities*: Whistle Bend Connector may result in contaminated storm water runoff entering McIntyre Creek.	• Project design incorporates major setbacks from escarpment adjacent to Yukon River, thus eliminating potential for direct surface runoff to the river. • Drainage design includes capture and retention of surface water in retention ponds, ensuring no direct discharge of storm water to the river. • Drainage runoff will be managed and directed away from McIntyre Creek. • Monitoring should be implemented to ensure no erosion; implement corrective measures if required.	• Not significant • Not significant
Surface Water Flows	• Change in surface flows	• On-site activities will not result in changes to flows as no works are planned in or near water courses • Off-site activities will not result in long-term changes to flows in McIntyre Creek.	• None required • None required. Design of culvert will result in no change in long-term flows in McIntyre Creek, and will improve fish passage at this location.	• Not significant • Not significant
Fish Habitat	• Alteration of fish habitat	• On-site activities: Indirect effects resulting from contaminated storm water runoff into Yukon River. • Off-site activities: Culvert replacement on McIntyre	• Project design incorporates major setbacks from escarpment adjacent to Yukon River, thus eliminating potential for direct surface runoff to the river. • Riparian setbacks are included in design, so that fish bearing waters are protected. • Drainage design includes capture and retention of all surface water in retention ponds, ensuring no direct discharge of storm water to the river, and no associated effects on fish habitat. • Replacement of culvert will be in accordance with DFO's Land Development	• Not significant • Positive effect.

VEC/VSEC	Potential Effect	Mechanism	Mitigation	Significance
		Creek will result in improved fish passage and access to upstream fish habitat.	Guidelines for the Protection of Aquatic Life. There is expected to be a long-term benefit to fish and fish habitat as a result of culvert replacement. Juveniles will overwinter in the creek and be able to access suitable overwintering habitat above the culvert.	
Wildlife Diversity and Habitat	• Displacement of wildlife	• Humans, pets and traffic noise will cause displacement of wildlife as subdivision is built out. Increased human encroachment will result in long-term displacement of wildlife.	• Whistle Bend developed within the urban boundary of the City, and adjacent to built-up areas to avoid higher valued wildlife areas elsewhere in the City. • Within Study Area, Project footprint avoids areas of higher value for wildlife and avoids areas of vegetation diversity valued for wildlife habitat. • No further mitigation identified. Planning process recognized that permanent changes to natural environment are inevitable result of urban expansion and that some displacement of wildlife is one unavoidable consequence.	• Not significant. • Project design is consistent with objective to minimize effects on valued wildlife areas.
Recreational Use	• Loss of existing recreational trails and aesthetic values	• Permanent loss of portions of existing trail network • Increased noise and disturbance will reduce recreational aesthetic values for existing recreational users at Mountain View golf course and along Yukon River.	• No “Special Places” identified in the baseline studies are encompasses by the Phase I and II project. At least 50% of the Study Area has been retained for recreational purposes. The Project design avoids majority of trail network and incorporates greenways to maintain thoroughfares through the development. • Informal recreational use along escarpment and this area is zoned PE – protecting it in an undisturbed state. • The Perimeter Trail (around the development site) will be paved, and serve to enhance local recreational opportunities for Whistle Bend residents. • See above comments under **Wildlife Diversity and Habitat** • Golf course remains undisturbed by Project. • Project location is setback from the escarpment above the Yukon River; therefore it will not be visible from the river, resulting in no change to viewscape from the river.	• Not significant.
Schools	• Increased demand for school services for population increase of approximately 1800 to 2650 residents. This increase represents approximately 380 students at build-out of Phases 1 and 2.	• Approximately 300 to 400 new students (17% of population) are expected to live in Whistle Bend at build-out. Increased demand for local and dispersed school services will be required.	• Utilization of two closest schools, Jack Hulland and Porter Creek Secondary, currently below ideal enrolment and peak capacity. Most elementary schools in Whitehorse area are operating below ideal capacities. In the unlikely event that Jack Hulland and Porter Creek Secondary schools were unable to absorb the new students, other schools in Whitehorse are well-positioned to absorb additional students. Bussing to schools dispersed throughout Whitehorse is an already common occurrence.	• Not significant
Protective Services (Fire Protection)	• Increased demand for protective services as population increases	• Phase 1 and 2 represents a 12.8% increase in number of private dwellings in Whitehorse.	• A new firehall is currently under construction at the top of Two Mile Hill in Whitehorse. This new facility is expected to readily accommodate the increase in the number of housing and a single commercial unit proposed for the Phase 1 and 2 Project. No additional mitigation required at this time.	• Not significant.
Traffic	• Increased traffic volumes	• Increased traffic will be generated as residential development progresses.	• City of Whitehorse completed traffic model to identify future traffic conditions resulting from residential growth in the City. Optimal traffic and transit solutions will be identified for the City, and are beyond the scope of this Project. Ongoing efforts by City Planners will ensure that traffic-related effects of the project are minimized through the application of optimal planning solutions.	• Not Significant.

7. Conclusion

The proposed Whistle Bend subdivision has been the subject of an intensive and lengthy planning process that has been community driven - one that has to a very large extent incorporated sustainability objectives into the footprint and detailed, community-based design of the project. The Project fits within the City of Whitehorse Official Community Plan, and indeed represents a significant area of future residential expansion within the City limits. The potential adverse long-term effects of the Project result from the permanent change to the existing landscape; specifically that there will be permanent loss of existing vegetation and undeveloped open space. However, this is consistent with the community vision as detailed in the OCP. As the Project is built-out and the population expands, there will be increased demand for services. The off-site services have been planned to accommodate this growth where needed, and again, must be considered in the context of urban development of the City. The potential long-term effects of the Project have been offset by the reduced footprint, sitting on the Lower Porter Creek Bench, and design features that incorporate a large percentage of greenspaces and on-site drainage features.

During construction, potential adverse effects have been identified but are not considered to be significant. Most can be addressed through the application of Best Management Practices and other practical measures to ensure that air quality, water quality and habitat effects are minimized. Increased traffic, noise and disturbance during this phase is unavoidable, but will be short-term and localized. Again, wherever practical, practices will be applied to minimize potential disruption to local residents and nearby neighbourhoods.

The assessment team has evaluated the potential effects of the Project and concluded that, with the application of mitigation measures as proposed, the Project is unlikely to cause any significant adverse environmental or socio-economic effects.

8. References

AECOM Canada Ltd. (2009). *Whistle Bend Concept Development & Community Consultation Summary Report.* Prepared for the City of Whitehorse.

AECOM Canada Ltd. (2009). *Whistle Bend Master Plan Servcing Concept.* Prepared for the City of Whitehorse.

G.J. Bull & Associates Inc. in association with Pottinger Gaherty Environmental Consultants Ltd. (2005). *Porter Creek Lower Bench Proposed Development Preliminary Climate and Air Quality Assessment Final Report.* Prepared for Yukon Government.

Gartner Lee Ltd. in association with Vector Research. (2006). *Porter Creek Bench Socio-Economic Background Report.* Prepared for the City of Whitehorse Planning and Development Services.

Gartner Lee Ltd. (2006). *Porter Creek Bench Environmental and Special Places Background Report.* Prepared for City of Whitehorse Planning and Development Services.

Matrix Research Ltd. (2008). *Heritage Resources Impact Assessment Report: Whistle Bend Subdivision.* Prepared for the City of Whitehorse.

Matrix Research Ltd. (2009). *Heritage Resources Impact Assessment Interim Report: Whistle Bend Connector Study.* Prepared for the City of Whitehorse.