

Project Overview

The Garibaldi at Squamish (GAS) Project is a proposed year-round destination resort on provincial Crown land at Brohm Ridge, approximately 15 kilometres (km) north of Squamish, 45 km from the Resort Municipality of Whistler, 68 km from West Vancouver, and 80 km from Vancouver. The Project is located within the traditional territory of the Squamish Nation.

Proponent Overview

The proponent, Garibaldi at Squamish Inc., is a private company with its head office in Vancouver. The principals of GAS are Northland Properties and Aquilini Investment Group, both of whom have extensive experience in resort and hospitality developments, including the development and operation of the Revelstoke Mountain Resort.



Project Benefits:

- Project construction costs are expected to exceed \$3.5 billion.
- The Project will provide more than 660 full-time equivalent direct construction jobs, and 250 full-time equivalent indirect and induced jobs.
- Once operating at full capacity, the project will employ up to 2,463 full-time equivalent direct jobs and an additional 319 indirect and induced jobs.

Project Components and Access

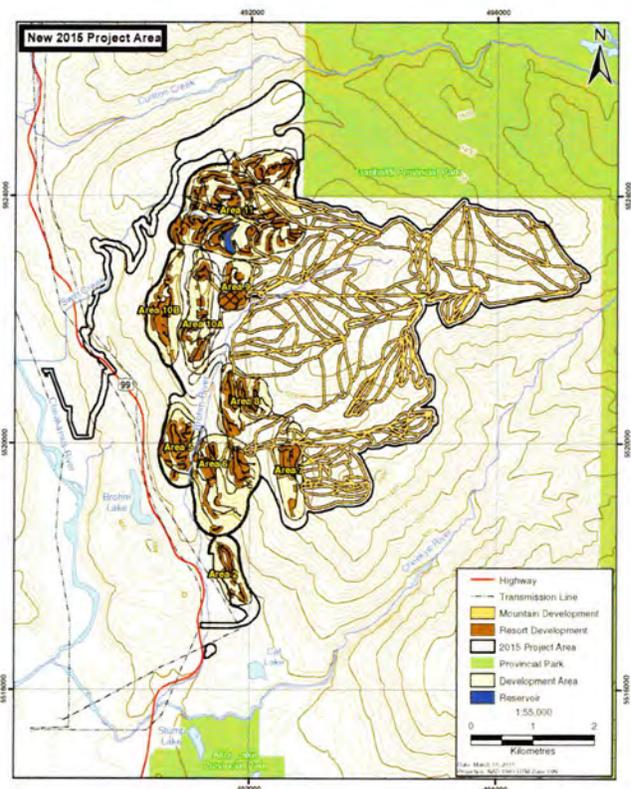
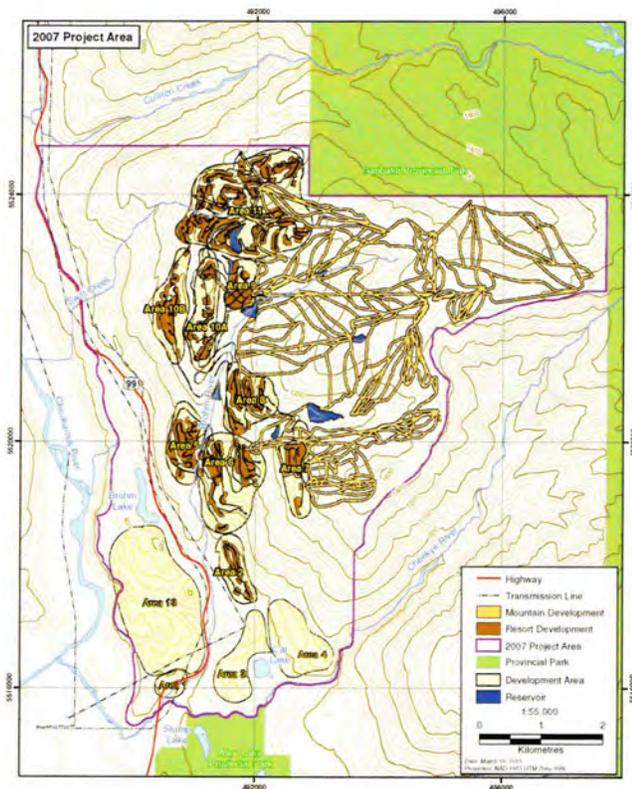
The Project Includes:

- On-mountain Ski Area Development - ski trails, gondolas, chairlifts, on-mountain lodges, and maintenance, grooming and safety facilities.
- Resort Base Area Development - hotel rooms, resort condominiums, town homes, single-family homes and employee housing (21, 920 bed units in total).
- Groundwater well(s) located in the Cheakamus River Valley aquifer.
- Snowmaking reservoir impounded by a 10 m high dam.
- Pump stations and water supply transmission line (1,200 m) to deliver water from the well.
- Water treatment plant within proposed Pump Station for disinfection and filtration (only for emergency reservoir water use).
- On-site power transmission substation linking to the BC Hydro Cheekye substation.
- Liquid waste treatment facility.
- Access to the resort from both sides of Highway 99, approximately 2.5 km north of the Alice Lake Provincial Park access.



Changes to Project since 2007

- **Avoidance of Brohm River** – the Resort’s water supply will be provided from groundwater well(s) within the Cheakamus River Valley aquifer, eliminating potential downstream impacts on Brohm River fish populations and tributaries.
- **Removal of water reservoirs** – the new Project design removes five potable water storage reservoirs and two snow making reservoirs, along with associated infrastructure.
- **Removal of golf courses** – the new Project design removes two proposed 18-hole golf courses.
- **Avoidance of Cat Lake and Brohm Lake** – the new Project design avoids encroachment on Cat Lake recreation area by removing Development Areas 3 and 4 and the Brohm Lake recreation area by removing Development Area 13
- **Reduced Project area** – removal of Development Areas 1, 3, 4, and 13 reduces the Project area by approximately 2,100 ha.
- **Improved access** – reduced length of the access road avoids encroachment on the Cat Lake or Brohm Lake recreation areas, as well as reducing traffic disruptions.



Environmental Assessment (EA) Process



Next Steps:

- Supplemental Application reviewed by public, local governments, Squamish Nation and government agencies.
- GAS responds to comments from public, local governments, Squamish Nation and government agencies on the Supplemental Application.
- Environmental Assessment Office prepares Assessment Report and draft conditions as necessary for referral to Ministers of Environment and Forests, Lands and Natural Resource Operations.
- Decision on Environmental Assessment Certificate by Ministers.

If the Ministers approve an Environmental Assessment Certificate for the Project, GAS Inc. still needs to:

- Update and finalize the Resort Master Plan and obtain Master Development Agreement approval from the Minister of Forests, Lands and Natural Resource Operations.
- Prepare an Environmental Monitoring Plan and all necessary management plans for construction and operations.
- Apply to local governments for zoning and development approval in conjunction with Official Community Plan amendments.
- Apply for all required construction and operation permits.
- Continue to monitor the Project construction through government agencies and the Squamish Nation, and engage with the general public as the Project is developed.
- Comply with any Environmental Assessment Certificate conditions (if issued) over the life of the Project, including construction.

Scope of Supplemental Assessment

In 2010, the Minister of the Environment and Minister of Forests, Lands and Natural Resource Operations requested further assessment of the Project to consider the following potential effects:

- Potential environmental effects of the Project including, but not necessarily limited to, effects on:
 - Fish and fish habitat.
 - Wildlife and wildlife habitat.
 - Vegetation.
 - Hydrology and water supply.
- Potential environmental, social, heritage and health effects associated with construction and operation of all water reservoirs and dams.
- Potential effects on social, economic, heritage and health values.
- Cumulative environmental effects.
- The potential adverse effects on Squamish Nation Aboriginal Interests.

The Supplemental Application is not a reassessment of the proposed Project and does not assess new topics. The Supplemental Application is only intended to complete the information requirements identified by the Ministers.

The Supplemental Application Information Requirements state that the Supplemental Application will assess:

- The groundwater supply option and
- Changes to the proposed Project and project project effects from developing groundwater as an alternative to surface water supplies.

The Supplemental Application also includes updates for any aspects of the environmental, social, economic, health and heritage effects of the proposed Project, which have changed substantially since the original 2007 Application was submitted or because of changes to the proposed Project.

Groundwater Effects Assessment

Rationale for Groundwater Effects Assessment

Water will be withdrawn from an aquifer located at the base of Cheakamus River Valley, which provides drinking water for nearby communities and businesses, and contributes to flow in streams. Water withdrawal has the potential to:

- Reduce flow rates in the Cheakamus River and other creeks and channels.
- Reduce groundwater levels in the aquifer.

Focus of Groundwater Effects Assessment

Valued Component	Potential Effects Assessed
Groundwater quantity	<ul style="list-style-type: none"> • Water table drawdown • Changes in flow patterns • Changes in recharge and discharge locations and amounts
Groundwater quality	<ul style="list-style-type: none"> • Mobilization of existing contamination • Changes in proportion of recharge from sources

Measures to Avoid and Minimize Groundwater Effects

- Water conservation and water demand management to reduce water requirements by more than 40% (250 l/p/d divided by 455 l/p/d).
- Monitor and replace supply wells that go dry as a result of drawdown associated with Project withdrawals.
- Manage the withdrawal rate and implement water conservation measures.
- Continuously monitor groundwater levels and withdrawal rates.

Results

Water table drawdown in the production well(s) is predicted to approach 75 cm. The level of water table drawdown is assessed to be **not significant** because:

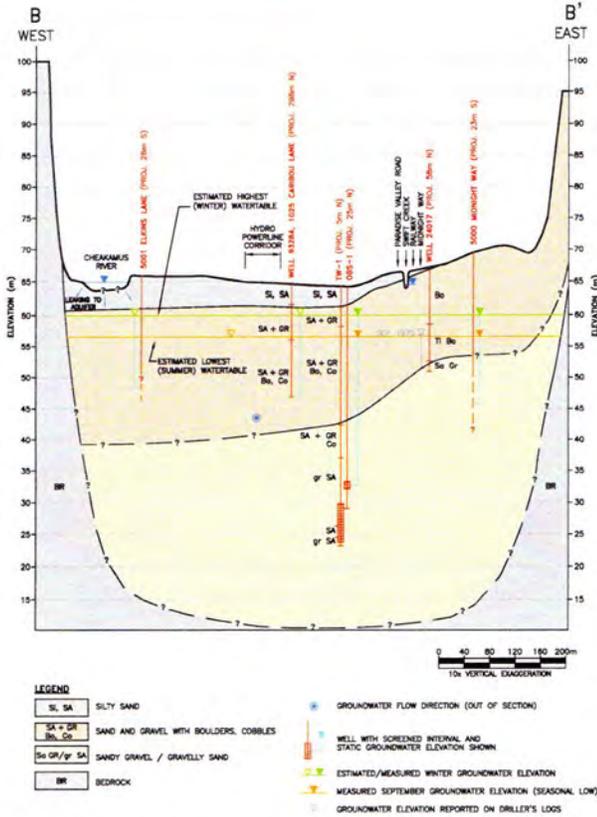
- It is limited to the Cheakamus River Aquifer upstream of the Paradise Valley Road Bridge.
- The extent of the effect is moderate, with drawdown of 50 cm and less expected at domestic wells within 500m of the production well.

No other changes to groundwater quantity are predicted. No changes to groundwater quality are predicted.

When effects of other projects are considered, cumulative effects to water table drawdown are assessed to be **not significant**.

Groundwater Effects Assessment

Cross Section B-B'



LEGEND

SA, SA	SILTY SAND	→	GROUNDWATER FLOW DIRECTION (OUT OF SECTION)
SA + GR	SAND AND GRAVEL WITH BOULDERS, COBBLES	○	WELL WITH SCREENED INTERNAL AND STATIC GROUNDWATER ELEVATION SHOWN
SA GR / Gr SA	SANDY GRAVEL / GRAVELLY SAND	○	ESTIMATED/MEASURED WINTER GROUNDWATER ELEVATION
BR	BEDROCK	○	MEASURED SEPTEMBER GROUNDWATER ELEVATION (SEASONAL LOW)
		○	GROUNDWATER ELEVATION REPORTED ON DRILLER'S LOGS

NOTES:

- CHEAKAMUS RIVER, SWIFT CREEK, AND GROUNDWATER ELEVATIONS MEASURED ON MARCH 21, 2013.
- SEASONAL LOW WATER LEVEL MEASURED SEPTEMBER 22, 2013.
- WELL 93284, 24017 LOCATIONS APPROXIMATE.

Contour Plot of Groundwater Elevations in March 2013



LEGEND

- Surveyed Water Level (Note 4)
- Groundwater Monitoring Station
- Surface Water Monitoring Station
- Test Well TW-1
- Water Well
- Interpreted Groundwater Equipotentials
- Elevation Contour (100m spacing)
- Elevation Contour (25m spacing)
- Section Location
- Simulated 100-Day Well Capture Zone for TW-1 (72 L/s)
- Interpreted Aquifer Boundary
- Property Boundary

Notes:

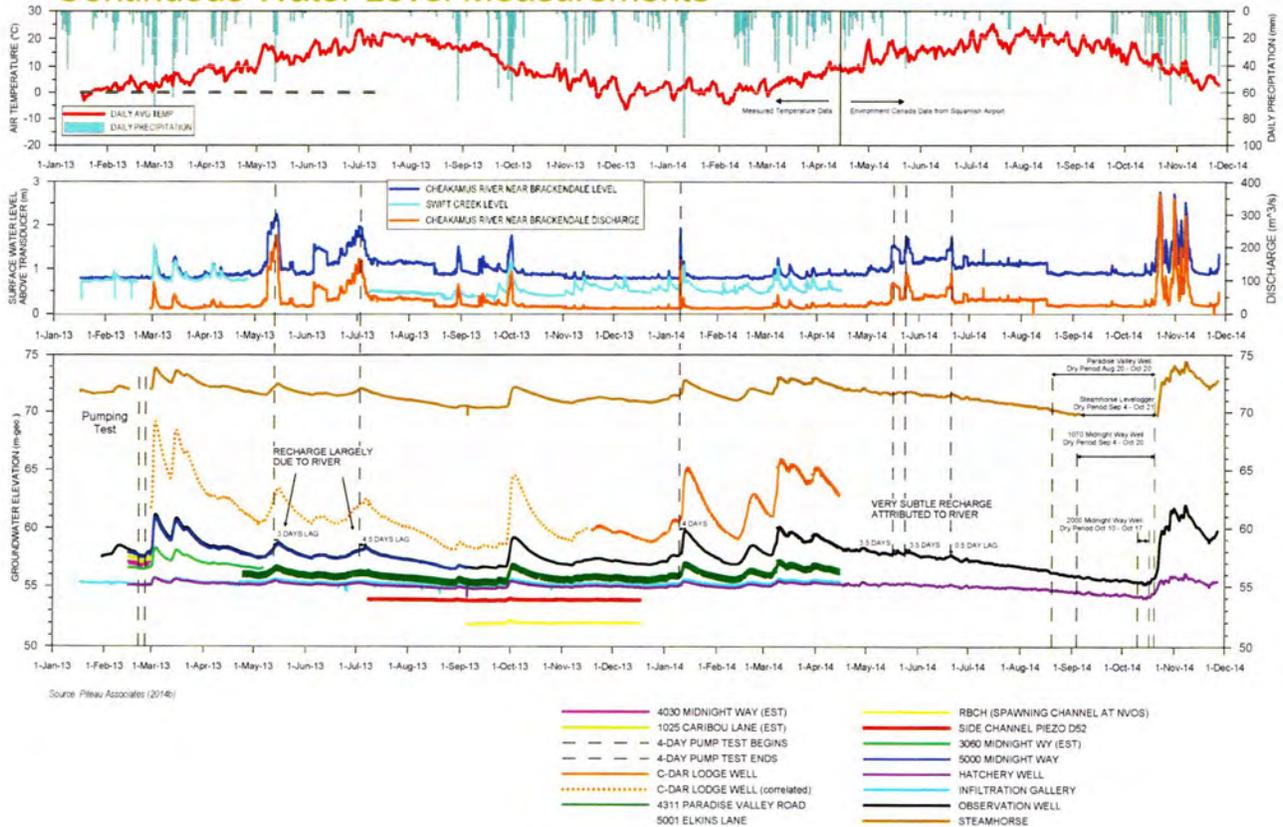
- Water levels from BC Water Well Database (2013).
- Aquifer extents from BC Ministry of Environment Water Protection and Sustainability Branch (2011).
- Equipotential contours based on water levels measured March 21, 2013 at 10:00am.
- Water level at 3080 Mainlight Way is estimated.

Source
PITEAU ASSOCIATES

- The aquifer is more than 35 metres thick and supports high water flow.
- Water flow through the aquifer varies seasonally from 500 litres per second to more than 1,500 litres per second.
- Shallow domestic wells currently dry up after sustained droughts.
- GAS well withdrawal will reduce aquifer levels by 0.5 metres.
- The connection between groundwater and the Cheakamus River will limit drawdown in the aquifer.

Groundwater Effects Assessment

Continuous Water Level Measurements

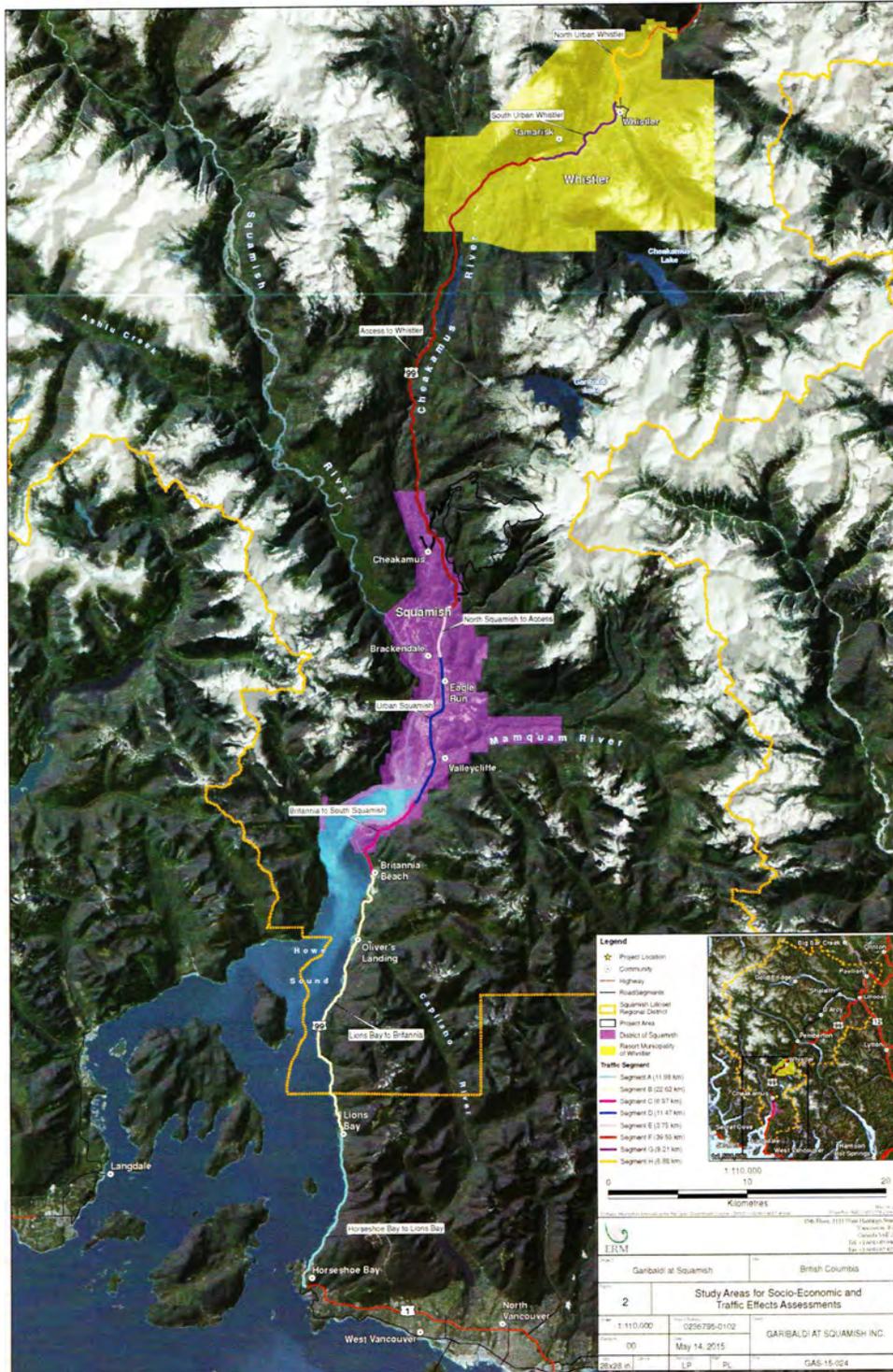


- Aquifer levels are very dynamic with large seasonal variations.
- Water level effects due to natural variation are more significant than the 0.5 metre drawdown predicted for GAS well withdrawals.

Study Areas for Groundwater, Fish, Heritage, Human Health, Vegetation, and Wildlife Assessments



Study Areas for Socio-Economic and Traffic Effects Assessments



Fish and Fish Habitat Effects Assessment

Rationale for Fish and Fish Habitat Effects Assessment

Withdrawal of water from the Cheakamus River Valley aquifer and construction of a water supply transmission line adjacent to Swift Creek have the potential to:

- Impact fish habitat in the Cheakamus River and its side-channels from reductions in discharge.
- Impact fish habitat and fish populations in Swift Creek and the Brohm River from pipeline construction.

Overall effects on fish and fish habitat will be reduced relative to past proposals due to removing Brohm River as a water source and augmenting water flows in Swift Creek.

Focus of Fish and Fish Habitat Effects Assessment

Valued Component	Potential Effects Assessed
Fish and fish habitat in Cheakamus River	<ul style="list-style-type: none"> • Habitat loss • Changes in water quantity • Changes in water quality • Fish mortality
Brohm River and Swift Creek salmon and trout populations	<ul style="list-style-type: none"> • Habitat loss • Changes in water quantity • Changes in water quality • Fish mortality

Measures to Avoid and Minimize Fish and Fish Habitat Effects

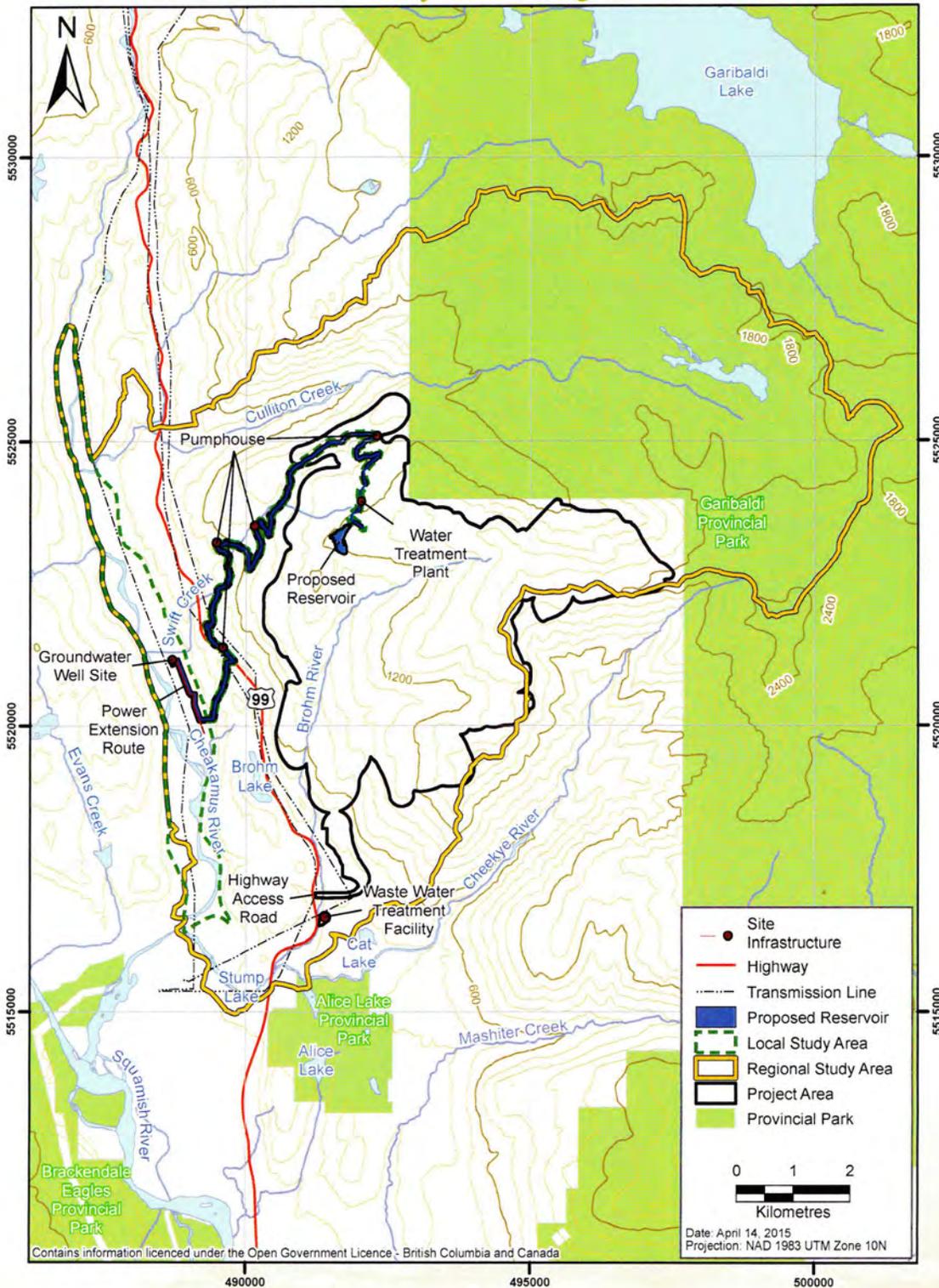
- Implement best practices and guidelines to protect fish and fish habitat
- Groundwater Management Plan
- Erosion and Sediment Control Plan
- Watershed Protection Plan
- Drainage Control / Stormwater Management Plan
- Liquid Waste Management Plan
- Spill Contingency Plan
- Water Management Plan
- Non-point Source Waste Discharge Control Plan
- Air Quality Management and Monitoring Plan
- Fugitive Dust Management Plan
- Employees will be prohibited from fishing while working or travelling to and from work
- Enhance Swift Creek water flows, as required, in support of stream keepers' volunteer efforts to enhance fish habitat

Results

No residual or cumulative effects on fish and fish habitat are anticipated as a result of the Project.

Fish and Fish Habitat Effects Assessment

Site Infrastructure Potentially Interacting with Fish Habitat



Vegetation Effects Assessment

Rationale for Vegetation Effects Assessment

During construction, vegetation clearing to develop ski runs, roads, and buildings has the potential to result in:

- Loss of important plants.
- Loss of rare or listed plant communities (ecosystems).
- Edge effects that change the quality or functions of an ecosystem.
- Introduction and/or spread of invasive plants.

Overall vegetation impacts will be reduced from past proposals due to Project changes in design and size, as well as removal of golf courses and associated development areas.

Focus of Vegetation Effects Assessment

Valued Component	Potential Effects Assessed
Old-growth forests	• Loss and/or alteration of old growth forests, rare or listed plants, or rare or listed plant communities
Rare or listed plants	
Rare or listed plant communities (ecosystems)	

Measures to Avoid and Minimize Vegetation Effects

- Avoid environmentally sensitive areas and riparian areas, such as wetlands, streams and ponds.
- Build ski runs in areas of natural clearings, and locate ski run/lift lines, roads, and residential development in areas that minimize vegetation loss.
- Retain smaller trees and other wind firming measures near the edge of ski runs to reduce edge effects.
- Retain vegetation and natural features in forest patches, grassland, and rocky areas surrounding the snowmaking reservoir.
- Limit land clearing needed for the snowmaking reservoir.
- Re-vegetate disturbed areas as soon as possible with a native seed mixture that is certified weed-free.

Vegetation Effects Assessment

Results

After implementation of mitigation measures, the Project is predicted to result in the loss or alteration of:

- Rare or listed plants including edge effects on Cascade parsley fern (blue-listed) and loss of an occurrence of naked roundmoss (yellow-listed).
- Rare or listed plant communities are primarily yellow-listed. Small areas of blue-listed ecosystems will be lost or altered.
- Loss and alteration of old-growth forest areas from clearing and edge effects, and loss of Old Growth Management Areas (OGMA).

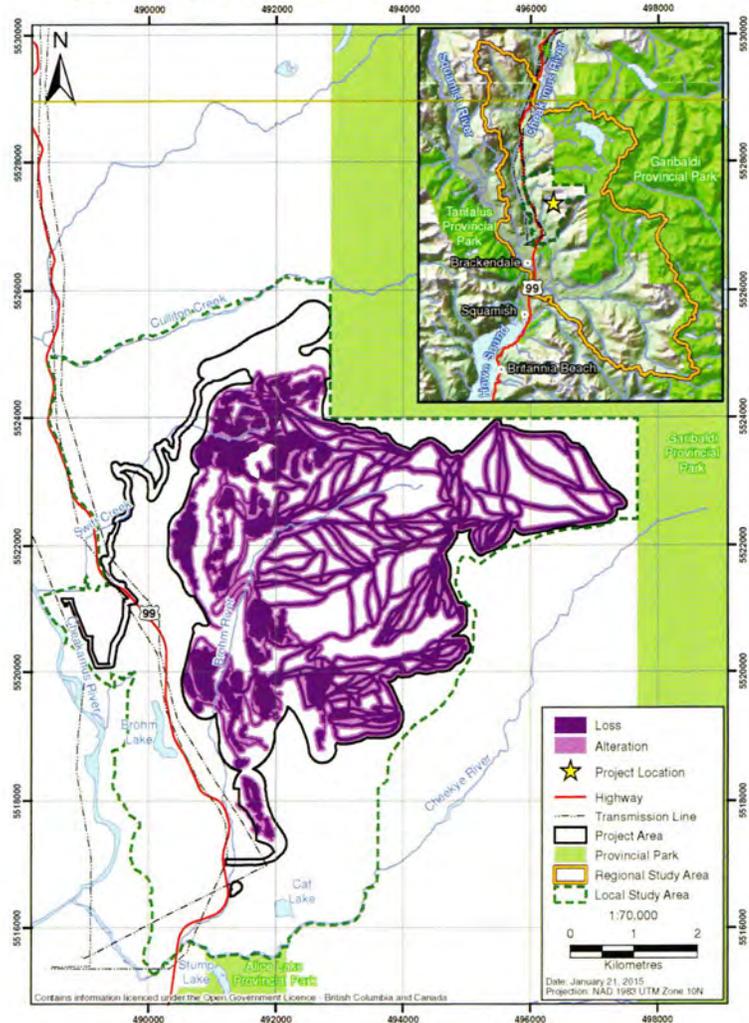
Residual effects on rare or listed plant communities and old-growth forests are rated as **not significant** because:

- No red-listed plant communities are affected, and most of the affected listed plant communities are yellow-listed (18%).
- Minimal loss (3%) or alteration (4%) of blue-listed communities of total listed plant communities.
- Minimal loss (22%) or alteration (24%) of old-growth forests will mostly occur in higher-elevation zones which have adequate old-growth forests.
- Effects to old-growth management areas will not impair Mamquam Landscape Unit targets for old-growth retention.

Potential cumulative residual effects on rare or listed plant communities and old-growth forests are assessed as **not significant** because:

- Potential effects to listed plant communities are primarily to yellow-listed not blue-listed communities (no red-listed communities affected).
- Old Growth Management Area (OGMA) targets for the Mamquam Landscape Unit and will be met with existing OGMA during all Project phases.

Project Footprint Areas Classified as Loss or Alteration



Red-listed: Considered to be extirpated, endangered, or threatened in BC.

Blue-listed: Considered to be of special concern in BC.

Yellow-listed: Considered secure and not at risk of extinction.

Wildlife Effects Assessment

Rationale for Wildlife Effects Assessment

Need for additional wildlife baseline information, re-assessment of effects on some species at risk, and a summary of changes in effects resulting from the revised project description.

Focus of Wildlife Effects Assessment

	Valued Component	Potential Effects Assessed
Full Assessment	<ul style="list-style-type: none"> • Passerines (species at risk) • Raptors, such as spotted owl, peregrine falcon, western screech owl • Great blue heron • Marbled murrelet • Harlequin duck • Small mammals, such as pacific water shrew • Reptiles such as rubber boa 	<ul style="list-style-type: none"> • Habitat loss and alteration • Sensory disturbance • Mortality
Groundwater Supply Amendment	<ul style="list-style-type: none"> • Mountain goat • Black-tailed deer • Black bear • Grizzly bear • Wolverine • Bobcat, cougar, coyote, and wolf • Fisher • Townsend's big-eared bat • Coastal tailed frog 	<ul style="list-style-type: none"> • Habitat loss and alteration • Sensory disturbance • Mortality

Examples of Measures to Avoid and Minimize Wildlife and Wildlife Habitat Effects

- Avoid removal of wildlife trees.
- No logging or vegetation clearing during bird nesting season, or conduct surveys for nests and cease activities until management plan, including buffers, is developed.
- Create non-disturbance buffer around active raptor nest sites.
- Conduct surveys for amphibian species at risk and, if observed, adaptively mitigate (e.g., avoid wetlands, modify placement of infrastructure, establish buffer zones, crossing tunnels, salvage program).
- Maintain habitat connectivity, retain riparian buffers and retain slash piles for small mammals.

Wildlife Effects Assessment

Results

After implementation of mitigation measures, the Project is predicted to result in the following potential residual effects on the following wildlife Valued Component species at risk:

- Marbled murrelets – Potential loss of approximately 2% of suitable nesting habitat in the Local Study Area (LSA), most of which is also designated critical habitat. Edge effects may alter a small percentage of suitable nesting habitat.
- Harlequin ducks – No harlequin ducks were observed during surveys; however, suitable habitat occurs within the LSA and there is the potential that 7% of habitat within the LSA could be lost.
- Passerine (Species at Risk) – Potential loss of 17% of habitat for three passerine species at risk (olive-sided flycatcher, sooty grouse, and band-tailed pigeon). It is anticipated that these birds will establish nesting areas in within the broader area and the disruption will be temporary.
- Raptors (spotted owl, western screech owl, northern goshawk) – Potential loss of suitable old growth habitat as a result of clearing activities, affecting approximately 22% of suitable habitat in the LSA.
- Amphibians (western toad and red-legged frog) – Potential loss and alteration of 6% of amphibian habitat from clearing in the LSA and edge effects to 10% of habitat in the LSA. Construction activities and vehicles may result in some wildlife mortalities; however, culverts and riparian buffers will reduce the magnitude of the effect on the population.
- Pacific water shrew – Potential for bird mortality from vehicle collisions; however, mitigation (e.g., culverts) will reduce the magnitude of the effect on the population.



Residual effects are rated as **not significant** after mitigation, as effects are limited in geographic extent and magnitude. Interactions with past and ongoing forestry activities identified, but **no significant cumulative effects** are anticipated.

Socio-Economic Effects Assessment

Rationale for Socio-Economic Effects Assessment

The Project's workforce and accommodation units could increase local population levels, resulting in increased demand on local services, infrastructure and housing. The Project could compete with similar businesses for customers and labour. The Project will be located in an area currently used for public recreation.

Focus of Socio-economic Effects Assessment

Valued Component	Potential Effects Assessed
Population and demographics	• Changes in population levels and demographic structure
Community economic health	• Change in business revenue and labour competition
Employment and income	• Changes to employment levels and income levels
Government revenue	• Change in government revenue
Housing	• Changes in market and rental housing availability and costs • Change in market housing values and sales • Change in availability of local parking
Community services	• Change in demand on community services
Recreational land use	• Change in access and use of recreational land use sites • Change in quantity of natural resources used within recreation areas • Change in quality of experience at recreational land use sites
Crown-granted tenures	• Change in access to tenure sites • Change in land use sites
Local government finances	• Change in local government spending
Local transportation systems	• Change in access to local public transportation

Measures to Avoid and Minimize Socio-Economic Effects

- Communicate with local governments and service providers.
- Hire locally, coordinate employee training and sourcing.
- Work with local service providers to determine needs for on-site services.
- Work with the BC Ministry of Forests, Lands and Natural Resource Office to finalize a memorandum of understanding about forestry management.
- Support continued wood lot activity, where compatible.

Socio-Economic Effects Assessment

Results

After implementation of mitigation measures, the Project is predicted to result in the following residual effects:

- Increased demand for tourism labour in Squamish-Lillooet Regional District. This effect is assessed to be **significant** due to:
 - Tight labour market within the region which could reduce ability of Whistler businesses and other businesses in the Squamish –Lillooet Regional District to recruit and retain employees.
- Potential for increased housing costs. For housing market, there is an anticipated 30% price inflation in first five years, 45% inflation in the first 10 years, and 60% price increase in first 20 years. Rental costs are anticipated to increase by 10% to 20%. These potential residual housing effects are assessed as **not significant** because:
 - Squamish currently has one of the lowest housing costs and lowest rates of housing price growth in region.
 - Increases to housing costs will be experienced unevenly by residents, with some residents (current owners) potentially experiencing a beneficial effect.



The Project is **not anticipated to negatively impact** business revenue, government revenue or employment and income in Whistler, as visitation of the Project is anticipated to be additional to existing and future demand and is anticipated to increase visitation to Whistler.

The Project is **not anticipated to negatively impact** community services in Squamish as the Project will be phased in over time and will consider on-site services. Increased demand for community services is anticipated to be small in comparison with natural population growth, which is predicted to more than double by build out.

No new effects on public recreation are expected as a result of project design changes.

No potential cumulative effects are anticipated for the Project. The Project is not expected to interact cumulatively with population and demand-driven housing cost effects. The housing market is expected to adjust to demand by increasing supply.

Health Effects Assessment

Rationale for Health Effects Assessment

The Project assessed human health effects related to potential changes in groundwater quality.

Focus of Health Effects Assessment

Valued Component	Potential Effects Assessed
• Environmental Health (drinking water quality)	• Changes to quality of drinking water quality

Measures to Avoid and Minimize Human Health Effects

- Uni-directional flushing to maintain well infrastructure.
- Regular maintenance to review well structural integrity, inspection for leaks, equipment service checks, and preventative maintenance.
- Hydrant maintenance and inspection of hydrants.
- Monitoring by geotechnical and hydrogeological consultant to check water quality, water levels, well capture zones, aquifer capacity, and groundwater extraction levels.
- Groundwater disinfection.
- Emergency Response Plan detailing procedures required during water emergency situation.
- Meet requirements of *Drinking Water Protection Act* and Drinking Water Protection Regulation.

Results

No residual or cumulative effects to human health anticipated due to changes in groundwater quality.

Heritage Effects Assessment

Rationale for Heritage Effects Assessment

Construction activities for the groundwater component such as excavation, clearing, and grubbing can result in loss or alteration of heritage sites. An Archaeological Overview Assessment identified no areas of archaeological potential in the Project area.

Focus of Heritage Effects Assessment

Valued Component	Potential Effects Assessed
Archaeological and heritage sites protected by the <i>Heritage Canada Act</i>	<ul style="list-style-type: none"> • Known archaeological sites • As-yet unknown archaeological sites

Measures to Avoid and Minimize Heritage Effects

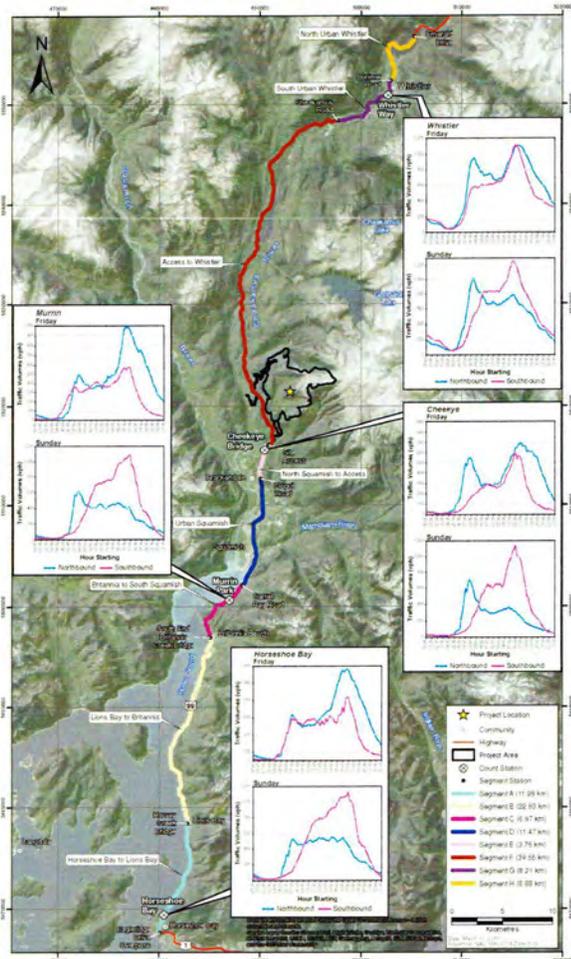
- Chance Find Procedure to deal with heritage sites encountered during construction, if potential archaeological sites are encountered.
- Prior to construction, undertake an archaeological assessment of Highway 99 access road, electrical power to well Pump Station, and reservoir and dam to determine whether additional archaeological studies are required.
- Implement best management practices if archaeological sites are identified.

Results

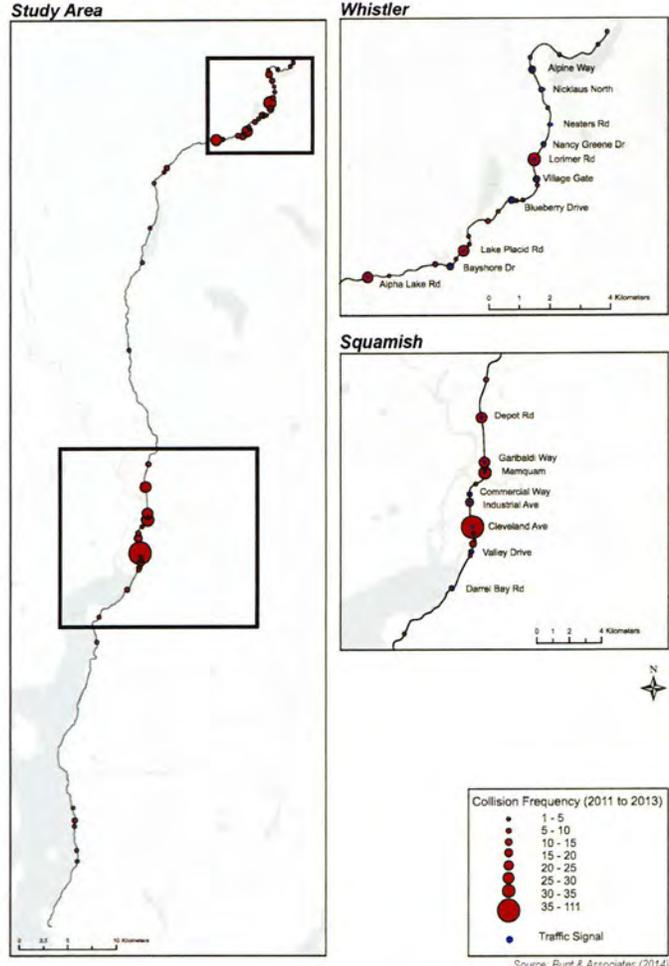
No residual or cumulative effects on heritage sites from development of groundwater supply anticipated.

Traffic Effects Assessment

February 2013 Daily Traffic Profile



Collision Frequency



Traffic modelling was undertaken along Highway 99 to identify traffic levels and collision frequency.

Project Benefits

The Garibaldi at Squamish (GAS) resort would enhance Squamish's international reputation as a community that is "Hardwired for Adventure."

GAS would become a local partner in the sponsorship and development of local events and facilities and would enhance public recreation opportunities.

The resort would contribute to the sustainable development of Squamish's natural and economic assets, creating long-term growth and quality jobs close to home.

Annual sustained economic activity would benefit local residents and businesses over the 15 – 20 years of phased in construction period and operations with:

- a project budget expected to exceed \$3.5 billion;
- more than 660 full-time equivalent direct construction jobs and 250 full-time equivalent indirect and induced jobs;
- more than 2,400 full-time equivalent jobs and an additional 300 indirect and induced jobs;
- significant tax revenue; and
- strong demand for local services and products.

GAS would be the first new ski area developed in BC in over 30 years, also becoming the "greenest ski area operation" in North America with a full sustainability plan built to today's best environmental standards.

The Project's Environmental Management Plans will include wildlife and water protection, fishery enhancements, public transit, employee housing, and energy conservation, as well as a major water conservation program - a model for BC's living water smart policy.

Stewardship opportunities with local, non-profit and community-based organizations would enhance local environmental initiatives, such as fish and fish habitat enhancement.

GAS would support the Provincial government's efforts to manage access to Garibaldi Provincial Park and to develop a sustainable forest management program.

The Resort would assume the costs for all new on-site services and infrastructure. Project tax revenue would support off-site government services, such as health care, education and policing.