

# Screening Level Environmental Assessment of Proposed Billboard Project

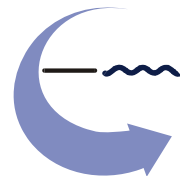
**Seymour Creek IR #2**  
**Capilano IR #5**  
**Kitsilano IR #6**

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## List of Acronyms

<b>AIA</b>	-	Archaeological Impact Assessment
<b>CEAA</b>	-	Canadian Environmental Assessment Act
<b>EIA</b>	-	Environmental Impact Assessment
<b>INAC</b>	-	Indian and Northern Affairs Canada
<b>PGL</b>	-	Pottinger Gaherty Environmental Consultants Ltd.
<b>SARA</b>	-	Species At Risk Act
<b>VEC</b>	-	Valued Ecosystem Components

## 1.0 OVERVIEW

The Squamish Nation (the Nation) retained Pottinger Gaherty Environmental Consultants Ltd. (PGL) to coordinate an Environmental Impact Assessment (EIA) of a project involving the installation of 13 billboards on First Nations lands in Vancouver and North Vancouver, British Columbia. The project was scoped in collaboration with Indian and Northern Affairs Canada (INAC) to meet its requirements as the 'Responsible Authority' for decision making under the *Canadian Environmental Assessment Act* (CEAA). The Table of Contents for the present report received preliminary approval from INAC in February 2006.

## 2.0 STRUCTURE OF THIS REPORT

Under the *Canadian Environmental Assessment Act* (CEAA), an Environmental Impact Assessment (EIA) requires five steps:

1. **Scoping:** Based on an overview of the site, the first step involves identification of all potential environmental issues of concern. These are divided into similar categories called Valued Ecosystem Components (VECs). These represent the systems which might be affected by the project (Potential Effect) and they become the subject of further investigation.
2. **Describing the Project:** This step involves describing the project, with a focus on those activities that have potential to impact the environment (Potential Cause).
3. **Describing the Environmental Setting:** This step, which is based on desktop research and field inventory work, describes the current environmental attributes of the site and surrounding area to determine which portions of the environment may be affected (Potential Impact Receptor).
4. **Effects Assessment:** This step evaluates the overall significance of individual effects by examining the nature of a cause and effect relationship, the significance of the cause and effect, and the likelihood of the cause and effect occurring. This step identifies whether management measures are required or possible to avoid, mitigate or compensate for a potential impact (Overall Significance of Effect).
5. **Management Recommendations for Mitigation:** This step identifies actions, strategies, and tools to reduce the impact of specific project activities, as required by the findings of the Effects Assessment (Managing and Reducing the Effect).
6. **Final Effects Assessment:** This step completes the Impact Assessment by identifying the remaining or residual impacts of the project once proposed mitigation identified in Step 5 has been implemented.

In an Environmental Impact Assessment, environment and ecosystem are taken to mean both the biophysical and socioeconomic surroundings of a project. VEC, therefore, is a comprehensive term describing both biophysical and socioeconomic systems that may be affected by the project.

Based on the requirements of an EIA and the Table of Contents approved by INAC, the report is structured as follows:

- Section 3.0 describes the scope of the current assessment;
- Section 4.0 describes the project, lists the project proponents, and describes the regulatory context;
- Section 5.0 describes the Environmental Setting in which the project will occur;
- Section 6.0 contains the Assessment of Impacts, Mitigation, Cumulative Impacts and effects of the environment on the Project; and
- Section 7.0 contains materials related to public consultation.

Supporting materials can be found in appendices.

### **3.0 PROJECT SCOPE**

The scope of an assessment includes a determination of the environmental and socioeconomic components of the environment that are likely to be affected by the project and focuses the assessment on these. Things to be scoped include:

- The locations of the project and appropriate surrounding area (spatial boundaries);
- The timing and duration of the project (temporal boundaries); and
- The components of the environment that may be affected by the project (VECs).

Each of these is discussed below. Also discussed in this section are the environmental regulations applicable to the project since these assist in scoping the project by identifying the protection benchmarks for a number of the valued ecosystem components.

#### **3.1 Definitions**

Spatial boundaries define the geographical extent(s) within which environmental effects are considered and are determined for each of the environmental components based on their respective characteristics and anticipated interactions with the proposed development. The boundaries were based on the zone of development influence beyond which the effects of the development were expected to be non-detectable.

The temporal boundaries for the assessment define the time periods for which likely environmental effects will be considered. The construction phase and operation phase of the project will be assessed.

### 3.2 The Site(s)

The project consists of 13 specific sites in three distinct locations as follows:

- Location 1 – Capilano: Two sites on Capilano Indian Reserve (IR) #5 northeast of the north end of the Lion’s Gate Bridge in the City of North Vancouver (Figure 1);
- Location 2 – Kitsilano: Five sites on Kitsilano IR#6 east and west of the south end of the Burrard Bridge in the City of Vancouver (Figure 2);
- Location 3 – Seymour: Six sites located as follows:
  - Two sites on Seymour Creek IR#2 near the intersection of Mount Seymour Parkway and Seymour Boulevard in the District of North Vancouver (Figure 3); and
  - Four sites on Seymour Creek IR#2 west of the north end Second Narrows-Iron Workers’ Memorial Bridge in the District of North Vancouver (Figures 4 and 5).

### 3.3 Spatial Boundaries

The spatial boundaries define the area that is assessed. They vary depending on whether those resources are terrestrial or aquatic, with specific distances for noise and air quality assessment.

#### Terrestrial Resources:

Terrestrial resources include:

- Land and soil (including soil contaminants);
- Vegetation;
- Wildlife; and
- Wildlife Habitat.

For the purposes of this assessment, the spatial boundaries for these resources are:

- For land and soil: the sign footings;
- For vegetation: a 1.0km radius from the sign location. This represents the maximum distance to the nearest undisturbed vegetation; and
- For wildlife and wildlife habitat: a 1.0km radius from the sign locations. This represents the maximum distance wildlife would need to travel to undisturbed vegetation.

#### Aquatic Resources

These include groundwater, as well as streams, ditches and watercourses. The spatial boundary for aquatic resources is a 0.2km radius around each site (Figures 1–5). This boundary was selected based on the potential for localized groundwater and runoff effects from construction activities.

## Air Quality and Noise

The spatial boundary includes the site extending to a 0.2km radius around the site (Figures 1–5). This boundary was selected based on the potential dispersion of fugitive dust from construction-related activities and realistic assumption that noise associated with the project would be non-detectable beyond 0.2km.

### **3.4 Temporal Boundaries**

The temporal boundaries include the construction phase from the time at which excavation begins, to the end of the life of the project. This is taken to be the end of the lease period (30 years) as described in Section 4.0 of this report and includes decommissioning of signs and support structures.

### **3.5 Valued Ecosystem Components (VECs)**

For this project, “the environment” includes the following:

- Topography;
- Climate/Air Quality;
- Land/Soil;
- Surface Water;
- Groundwater;
- Flora;
- Fauna;
- Species at Risk;
- Socioeconomic Resources;
- Land Use (on and adjacent to the site):
  - Existing Land Use;
  - Historic Land Use; and
  - Natural Resources;
- Cultural Resources, Traditional Use and Archaeology;
- Aesthetics:
  - Visual landscape; and
  - Lighting;
- Recreation; and
- Safety.

### 3.6 Regulatory Context

A number of environmental acts, regulations and policies apply to activities and structures contemplated in the project.

#### 3.6.1 Federal and Provincial Statutes

- *Fisheries Act, Section 34(1), 35(1) and 36.* These sections protect disruption of fish habitat, and prohibit the deposit of substances harmful to fish into fish-bearing water courses.
- *Migratory Bird Convention Act, Section 12* prohibits the injury or destruction of migratory birds and their nests.
- *Wildlife Act, Sections 9, 34 and 35,* regulates works having an impact on wildlife, including removal of nests or beaver dams, possession of birds, eggs or nests, and transportation of carcasses.
- *Weed Control Act, Weed Control Regulations* prevents the spreading of noxious weeds and their seed.

The Squamish Nation and all adjacent municipalities have sign bylaws which INAC has requested be summarized to provide context for the evaluation of this project. These documents have been included in Appendix 1. The pertinent details summarized below.

**Table 1: Applicable Sign Bylaws**

First Nation or Municipality	Billboard Bylaws (if applicable)
Squamish Nation	Billboards allowed on portions of some reserves provided that a signage permit is obtained and other requirements satisfied.
District of West Vancouver	No billboards allowed.
District of North Vancouver	No billboards allowed.
City of North Vancouver	No billboards allowed.
City of Vancouver	<p>Billboards allowed and specifically regulated based on sign size and location:</p> <ul style="list-style-type: none"> <li>• Billboards within the City of Vancouver are limited in size to a maximum of 9m<sup>2</sup> in surface area.</li> <li>• Billboards near bridges and highways are regulated as follows:  <i>The following signs shall be permitted in Bridge and Freeway Areas:</i> <ul style="list-style-type: none"> <li>(d) <i>Billboard, except that a billboard shall not be permitted:</i> <ul style="list-style-type: none"> <li>(i) <i>above any bridge deck;</i></li> <li>(ii) <i>within 50m of any elevated bridge entry or exit ramp where the billboard exceeds the height of the ramp;</i></li> <li>(iii) <i>within 50m of the Trans-Canada Highway</i></li> </ul> </li> </ul> </li> </ul>

## 4.0 PROJECT DESCRIPTION

This section provides a brief history of the project, indicates a rationale for the project, describes the nature and location of the project, and identifies the project proponents.

### 4.1 Project History

In November 2004, the Squamish Nation retained All Vision Canada (“All Vision”) for a 30-year period to identify, evaluate and manage outdoor advertising opportunities on land controlled by the Nation. All Vision identified 28 locations on the Nation’s lands, as follows:

- Eleven signs on the Capilano IR;
- Seven on Kitsilano IR;
- Three on Mission IR; and
- Seven on Seymour Creek IR.

All Vision released an Offering Memorandum on behalf of the Nation in December 2004 and invited outdoor advertising companies to bid on the rights to operate advertising signs at the 28 locations. The Nation received a number of bids for the 28 locations. Following an evaluation of the bids the Nation awarded a 30-year contract to Outdoor Media Canada Inc. In an effort to mitigate anticipated concerns from neighbouring municipalities and the public, the Nation decided to reduce the number of signs from 28 to 13. The original number proposed and the final number awarded is outlined below:

Indian Reserve	Municipality	Original # of Signs	Final # of Signs
Capilano # 5	West Vancouver	11	2
Kitsilano # 6	Vancouver	7	5
Mission	North Vancouver	3	0
Seymour Creek # 2	District of North Vancouver	6	6
<b>Total</b>		<b>28</b>	<b>13</b>

The reductions included three large format signs (14' x 48') adjacent to the Lions Gate Bridge.

All Vision is responsible for the construction of the signs and will transfer ownership to Outdoor Canada Media Inc. on completion. In addition, All Vision will be responsible for overseeing the project during the term of its contract.

## 4.2 Project Rationale

The Nation has indicated that the project will help generate revenue while allowing it to retain ownership and control over its lands.

## 4.3 Project Location

As indicated in section 3.0, the project consists of 13 sign installations in three separate locations (Figures 1 through 5).

## 4.4 Project Details

This section describes the location and size of the proposed signs, their construction, and the infrastructure that will be needed to support sign construction and/or operation.

### 4.4.1 Sign Type and Size

The sign type accepted by the Nation is a mixture of single-face and double-face trivision structures (Trivisions). Trivisions are made up of a series of vertical three-sided prisms running horizontally across the sign face. The prisms rotate in unison enabling up to three images to be displayed during a rotation cycle. The images normally change every 3 to 10 seconds depending on advertiser requirements.

Each sign will be lit with two 400w metal halide fixtures, possess a catwalk to access the sign in order to change advertising, and be supported by a steel post painted dark green that has been embedded in an underground concrete base (“the footing”).

The sign size accepted by the Nation is 10' x 36.5' (approximately 3m x 11m). Footing size (the size of the concrete slab laid beneath the ground to hold up the pole supporting the sign) and sign height above the ground will vary, depending on the sign, as indicated in Table 2 at the end of this section.

### 4.4.2 Sign Construction

Construction will require:

- excavating holes and creating concrete footings at each sign location;
- assembly of billboard towers to hold the signs at each sign location;
- stringing of overhead electrical cables at each sign location;
- building or widening access/maintenance roads at each sign location; and
- clearing vegetation to improve visibility at some locations.

The details for each sign location are provided below in Table 2.

**Table 2: Sign Details**

Location	Sign #	Footing Size (L x W x Depth)	Sign Height (AGL)	Sign Type	Supporting Structures	Clearing required? (approx. amount, if yes)
Capilano	4	16'x16'x11'	15'0"	Double-faced, V-shaped	Above ground power line to supply electricity (See Figure 1)	3,600m <sup>2</sup>
	5	19'x19'x12'	23'0"	Double-faced, V-shaped		
Kitsilano	12	22'x22'x12'	38'0"	Double-faced, V-shaped	Above ground power line to supply electricity (See Figure 2)	700m <sup>2</sup> (canopy area)
	13	28'6"x28'6"x13'	52'0"	Double-faced, V-shaped		
	15	31' x 31' x 13'	68'0"	Double-faced, V-shaped		
	16	28'6"x28'6"x13'	55'0"	Double-faced, V-shaped		
	17	22'x22'x12'	52'0"	Single-faced		
Seymour	22	16'x16'x13'	10'0"	Single-faced	Above ground power line to supply electricity (See Figures 3-5)	No
	23	19'x19'x12'	20'0"	Double- faced, V-shaped		300m <sup>2</sup>
	24	16'x16'x11'	10'0"	Single-faced		400m <sup>2</sup>
	25	20'x20'x12'	26'0"	Double-faced, V-shaped		450m <sup>2</sup>
	26A	19'x19'x12'	23'0"	Double-faced, V-shaped @ 90°		No
	26	31'x31'x13'	66'6"	Double-faced, V-shaped, 'Full flag'		No

Surveys and design specifications for each sign are attached in Appendix 2. Construction access has not yet been determined but is expected to be from the nearest roadside. Access will therefore not require additional roadworks.

#### 4.4.3 Post-construction Operations and Maintenance

The Nation has a 30-year contract with All Vision for the construction, operation and maintenance of the signs. All Vision will coordinate the construction and installation of each sign structure, which will then be transferred to a purchaser that will assume responsibility for the maintenance of the sign structure and the property beneath each sign in accordance with individual leases or permit.

We have been advised that it is typical for advertising copy on each sign to be changed every 4 to 52 weeks (the typical duration of advertising campaigns).

#### 4.4.4 Post-construction Operations and Maintenance

The details of decommissioning have not been determined at present. It is expected that all above-ground infrastructure will be removed. It is not expected that the below-ground concrete will be removed unless proposed development of the sites require that.

#### 4.4.5 Proponent/Consultant Contact Information

The applicant, proponent and environmental consultants for this project are as follows:

Applicant	Proponent	Environmental Consultants
<p><b>Squamish Nation</b>                      c/o Toby Baker                      Business Revenue &amp; Services                      415 West Esplanade                      North Vancouver, BC V7M 1A6                      Tel: 604.982.0510                      Fax: 604.982.0515</p>	<p><b>All Vision Canada</b>                      c/o Blair Murdoch, President                      62 Queen Street S                      Mississauga, ON L5M 1K4                      Tel. 905.285.0245                      Fax 905.286.1335</p>	<p><b>Pottinger Gaherty</b>                      c/o Will Gaherty, Principal                      1200 – 1185 West Georgia Street                      Vancouver, BC V6E 4E6                      Tel: 604.682.3707                      Fax: 604.682.3497</p>

## 5.0 ENVIRONMENTAL SETTING

The following provides a general description of site conditions, as determined by desktop study and ground-truthing site visits.

### 5.1 Biophysical Resources

The biophysical resources include topography, climate, air quality, land, soil, surface water, groundwater, flora, and fauna.

#### 5.1.1 Topography

The topography at most sites is flat to gently sloping, with sites less than 30m above sea level. One site near the Ironworkers' Memorial Bridge is occupied by a large fill pile; this pile will require clearing or grading/densification before sign placement can begin.

#### 5.1.2 Climate

This zone is distinguished by moderate temperatures with maximum average highs of 22°C in July–August and minimum average lows of 1°C in January. The area receives an annual average of 1,400mm of precipitation annually, most of it concentrated as rainfall in the winter months.

#### 5.1.3 Air Quality

Air quality in all three locations is generally considered to be good and typically meets federal objectives for air pollutants. For most common contaminants, Vancouver's air quality is generally better than it was 20 years ago, despite steady population and economic growth. (GVRD, 2005). As would be expected for projects located near major thoroughfares, vehicle-based emissions of particulates and carbon dioxide are the main air pollutants at each location.

#### 5.1.4 Land/Soil

The Lower Mainland Ecoregion is bounded by the Coast and Cascade Mountains and traversed by the Fraser River. It is underlain by unconsolidated glaciofluvial deposits, silty alluvium, silty and clayey marine sediments and glacial till. Bedrock outcrops of Mesozoic and Palaeozoic origin form rolling hills up to about 310m above sea level.

Soils in the Kitsilano location are known to be contaminated due to historical activities. These contaminants are discussed further in see section 5.2.1 in relation to the historical land uses causing the contamination.

#### 5.1.5 Surface Water

With one possible exception, the signs are not near any watercourses. Sign 23 near the Seymour Parkway is expected to be near a permanently damp depression which hosts mossy vegetation.

#### 5.1.6 Groundwater

PGL's experience in the Lower Mainland indicates that depth to groundwater varies considerably. In areas near bodies of water (English Bay, False Creek, Burrard Inlet), groundwater can be expected less than 1m below ground surface (bgs). In other areas, urban development has altered the water table. Groundwater can reasonably be expected to be encountered at some sites at each location. Available information suggests groundwater depths are roughly 2m below ground at Kitsilano, roughly 4–5m deep at Capilano, and roughly 3–4m at Seymour.

#### 5.1.7 Flora

All three locations fall within the Coastal Western Hemlock, dry maritime (CWHdm) biogeoclimatic zone. Native vegetation is typically western hemlock (*Tsuga heterophylla*), western red cedar (*Thuja plicata*), Douglas fir (*Pseudotsuga menziesii*) and, following disturbance, successional red alder (*Alnus rubra*). Typical understorey species include salmonberry (*Rubus spectabilis*), salal (*Gaultheria shallon*), dull Oregon grape (*Mahonia nervosa*) and sword fern (*Polystichum munitum*).

**Table 3: Rare Plant Communities of CWHdm Biogeoclimatic Zone**

<b>Red-listed Communities</b>
Sitka spruce/salmonberry
Douglas fir/lodgepole pine/oceanspray/cladina
western red cedar/black twinberry
<b>Blue-listed Communities</b>
cottonwood/red osier dogwood
cottonwood/willow
western red cedar/swordfern
western hemlock/western red cedar/deer fern

Source: BC Conservation Data Centre, 1996 *Plant Community Provincial Tracking List, Rare Plant Communities*.

These communities are not present on the sites. In all locations, most of the characteristic vegetation has been cleared. In the Marine Drive and Ironworkers' Memorial Bridge locations, the sign sites are now characterized mostly by stands of young red alder and cottonwood with an understorey of salmonberry, sword fern and invasive Himalayan blackberry (*R. discolor*). The Burrard Bridge sites are presently being used as parking lots (sand/gravel surface) and are mostly unvegetated.

### 5.1.8 Fauna

As presently defined, the project will not occur within estuarine, marine, wetland, or riverine habitats. As a result, only terrestrial and avifauna are considered for this assessment.

Large terrestrial species traditionally present in this biogeographic zone include black bear, black-tailed deer and cougar. Given the extent to which clearing and urban development has occurred, however, these large mammals are not expected to be present at any of the project locations, except perhaps, as transients through the Seymour Parkway sites at the Ironworkers' Memorial Bridge location. Smaller species that may be expected at all locations include coyote (*Canis latrans*), raccoon (*Procyon lotor*), rat (*Ratus norvegicus*), and mouse (*Mus musculus*). Other terrestrial urban wildlife that may be expected include soil invertebrates, insects, rodents and feral or stray cats and dogs.

Many birds have adapted well to the urban environment and a large number can be expected at all three project locations. Table 4 provides a list of avifauna that are likely to use one or more of the project locations.

**Table 4: Avifauna<sup>†</sup> likely to be present at one or more project locations**

Common Name	Scientific Name	Common Name	Scientific Name
Bald eagle	<i>Haliaeetus leucocephalus</i>	Golden-crowned kinglet	<i>Regulus satrapa</i>
Cooper's hawk	<i>Accipiter cooperii</i>	Swainson's thrush	<i>Catharus ustulatus</i>
Glaucous-winged gull	<i>Larus glaucescens</i>	American robin	<i>Turdus migratorius</i>
Rock dove	<i>Columba livia</i>	Cedar waxwing	<i>Bombicilla cedrorum</i>
Steller's jay	<i>Cyanocitta stelleri</i>	European starling	<i>Sturnus vulgaris</i>
Northwestern crow	<i>Corvus caurinus</i>	Spotted towhee	<i>Pipilo erythrophthalmus</i>
Common raven	<i>Corvus corax</i>	Brewer's blackbird	<i>Euphagus cyanocephalus</i>
Black-capped chickadee	<i>Parus atricapillus</i>	House finch	<i>Carpodacus mexicanus</i>
Chestnut-backed chickadee	<i>Parus rufescens</i>	Pine siskin	<i>Carduelis pinus</i>
Bushtit	<i>Psaltriparus minimus</i>	House sparrow	<i>Passer domesticus</i>

\* This list of species is modified from species characteristic of the CWH biogeoclimatic zone (Pojar et al., 1991), the 1988 bird list from Stanley Park (Weber et al., 1988), and previous experience of PGL with species associated with Vancouver urban areas.

An annually active bald eagle's nest has been identified at Vanier Park but this is well beyond the spatial boundary for the project.

#### 5.1.9 Species at Risk

The *Species at Risk Act* (SARA) is federal legislation enacted to provide for the long-term legal protection of wildlife species and their habitats and the overall conservation of biological diversity. SARA is accompanied by a registry which lists all species that are, or may become, threatened, endangered, or extinct. British Columbia has prepared a list of species that are endangered or threatened within the province. Some species that are not listed in the SARA Registry can be found on the BC list since local factors may make a nationally distributed species more vulnerable in the BC region itself. Species in the project area that are federally and/or provincially listed are found in Appendix 3.

A review of the Endangered Species and Ecosystems Map (Ministry of Environment) did not identify any reported rare element occurrences (endangered or threatened species) in the project area. Review of the Ministry of Environment map does not conclude that there are no endangered or threatened species in the project area, but that none have been recorded.

## 5.2 Socioeconomic Resources

### 5.2.1 Land Use

Land use at the sites is generally urban. A summary of existing land use is provided below. This is followed by a discussion of the known historical uses for each location.

#### Existing Land Use

The Capilano locations are covered by a young mixed forest composed primarily of cottonwood and alder. Numerous small signs are located along the roadside. Surrounding lands are under the jurisdiction of the District of West Vancouver. Adjacent land uses include commercial across Capilano Road (restaurant and motel) and single-family residential development further south on the IR.

The Kitsilano locations are on a vacant gravel-surfaced lot beneath and adjacent to the south end of the Burrard Street Bridge at Burrard Inlet in the City of Vancouver. Adjacent land uses include a brewery and commercial office uses, high- and medium-rise multi-family residential buildings, an urban park (Vanier Park) and a public dryland marina and shoreline walkway.

The Seymour locations are in the District of North Vancouver near the north end of the Iron Workers' Memorial Bridge. Most have some vegetation, but one is occupied by a pile of fill. Signs 22 and 23 will be opposite a large commercial retail location and parking lot. Signs 24 and 25 will be between an on-reserve residential development and Highway 1. Sign 26A will be adjacent to a commercial aggregate supplier and an on-ramp to Highway 1. Sign 26 will be located adjacent to the Ironworkers' Memorial Bridge.

#### Historical Land Use

Prior to the current land uses, the lands associated with the Capilano and Seymour locations were forested. The original forest was removed either by logging or in the course of building the roadways and other infrastructure in their vicinity.

The Kitsilano locations, known to the BC Ministry of the Environment as the CP Wye property, served at various times as both a bus, trolley and train storage and maintenance depot for the BC Electric Railway (BCER) and the BC Hydro Railway. As a result of activities associated with these uses, the soils are expected to be contaminated by hydrocarbons (fuels, oils, and petroleum byproducts) and by low levels of metals. In addition, the Burrard Bridge's hydraulic bearings (at the "bents" or pillars supporting the structure) once contained polychlorinated biphenyl (PCB) compounds as a stabilizer. These PCBs are known to have leaked into soils beneath the bridge in the immediate vicinity of the bents. The City of Vancouver undertook a remediation program to remove PCB contamination, however we are uncertain about the endpoints for that remediation. A management program for soil that may be disturbed or covered by the signs is discussed in section 6.2.3.

## 5.2.2 Cultural Resources, Traditional Use and Archaeology

Consultation with Parks Canada indicated that, given past disturbance, the potential for archaeological or cultural heritage resources at the Capilano and Seymour locations was very low. As a result, it was determined that there was no need to conduct an Archaeological Impact Assessment (AIA) at any of the sites within the Capilano and Seymour locations.

The Kitsilano location, however, is immediately adjacent to the traditional Squamish settlement known as “Snauc” (Archaeological site DhRs-236) occupying most of nearby Vanier Park. As such, the Kitsilano sites were identified as having high potential for archaeological or cultural artefacts. An AIA was therefore recommended for this area.

Simon Kaltenreider, Registered Professional Consulting Archaeologist (RPCA), of Pacific Heritage Research was retained to conduct an AIA of the proposed sites at the Kitsilano location and, pursuant to Squamish Nation Archaeological Investigation Permit 2006-122, the AIA was conducted in August and September 2006. The goals of the AIA were to:

- Identify any archaeological or cultural deposits or resources in the proposed footing locations for signs 12, 13, 15, 15 and 17;
- Evaluate the overall integrity and heritage value of the location;
- Assess potential impacts of the project on cultural materials and deposits; and
- Provide recommendations, as needed, on measures to protect cultural or archaeological deposits or resources.

## 5.2.3 Aesthetics

Aesthetics is the study of the quality of a visual experience. Aesthetics are determined on the basis of two factors: the nature of the visual resource and the perception of that resource.

This section has been developed using the US Department of Transportation’s *Visual Impact Assessment for Highway Projects* as a guide.

### 5.2.3.1 Visual Resources

Visual resource is a term describing the various components of the landscape that combine to create a viewer experience. It is described using information about landforms, water features, vegetation, and the built environment. Taken together, these features create a pattern character of a particular visual resource. This pattern character is defined in terms of dominance, scale, diversity, and continuity. These are defined as follows:

**Dominance:** The position, contrast, extent or pattern of a landscape component when compared with its surroundings.

**Scale:** The apparent size relationship between a landscape component and its surroundings. A grain silo would appear to have a larger scale when sited on an open prairie than in a mountainous setting.

**Diversity:** The number and variety of pattern elements, as well as the relationships between them. A mixed-use development containing stores, parks and houses would appear more diverse than a farm field or a row of similar townhouses.

**Continuity:** The level to which pattern elements are interrupted. A landscape containing a road dipping behind hills would appear less continuous than a road on an open plain.

From these, the visual quality of a visual resource is determined. Visual quality is based on concepts of vividness, intactness and unity, which are defined as follows:

**Vividness:** The memorability of the visual impression received from contrasting landscape elements as they combine to form a striking and distinctive visual pattern.

**Intactness:** The integrity of visual order in the environment and the extent to which the landscape is free of visual encroachment.

**Unity:** The degree to which the visual resources of the landscape join together to form a coherent, harmonious visual pattern.

An appraisal of these three criteria permits an evaluation of visual quality to be made.

For the purpose of this assessment, each criterion is rated as low, moderate, or high. Based on these ratings, visual quality is inferred from combining the ratings as follows:

**Table 5: Visual Quality Ratings Table**

(H=High, M = Medium, L=Low)

Ratings	Vividness	Intactness	Unity	Visual Quality
<b>3H</b>	H	H	H	Very High
<b>2H+1M</b>	H	H	M	High
	H	M	H	
	M	H	H	
<b>2H+1L</b>	H	H	L	Moderate to high
	H	L	H	
	L	H	H	
<b>1H+2M</b>	H	M	M	Moderate
	M	H	M	
	M	M	H	
<b>1H+1M+1L</b>	H	M	L	Moderate to Low
	H	L	M	
	M	H	L	
	M	L	H	
	L	H	M	
	L	M	H	
<b>1H+2L</b>	H	L	L	Moderate to Low
	L	H	L	
	L	L	H	
<b>3M</b>	M	M	M	Moderate
<b>2M+1L</b>	M	M	L	Moderate to Low
	M	L	M	
	L	M	M	
<b>1M+2L</b>	M	L	L	Low
	L	M	L	
	L	L	M	
<b>3L</b>	L	L	L	Very Low

In this system, it is important to note that the term quality does not signify good or bad as these are subjective terms that are derived from viewer perception. Rather, quality refers instead to value-neutral descriptive characteristics of a landscape. Viewer perception is discussed in sections 6.2.12 and 7.0 of this report.

Because it is impossible to characterize the whole environment, the visual quality of key views are chosen and characterized. At the assessment phase, the change in these views can be assessed on the basis of changes to these variables.

For this project, the following key views were selected:

**Table 6: Key Views**

Location	Key View #	Description	Figure # (before project)	Figure # (after project)
Capilano	C-1	From Marine Drive, looking east ( <i>signs 4 &amp; 5</i> )	6	27
	C-2	From Westbound on-ramp, looking south ( <i>signs 4 &amp; 5</i> )	7	28
	C-3	From Marine Drive, looking west ( <i>signs 4 &amp; 5</i> )	8	29
Kitsilano	K-1	Burrard Bridge, looking north ( <i>signs 15,16,17</i> )	9	30
	K-2	Burrard Bridge, looking west ( <i>signs 12 &amp; 13</i> )	10	31
	K-3	Burrard Bridge, looking south ( <i>signs 15,16,17</i> )	11	32
	K-4	From Beach Avenue, looking southeast ( <i>sign 13</i> )	12	33
	K-5	From Anderson's Restaurant, looking southwest ( <i>sign 15</i> )	13	34
	K-6	From "Y" building roof, looking north ( <i>signs 12 &amp; 13</i> )	14	35
	K-7	From Credit Union roof, looking southwest ( <i>signs 12,13,16,17</i> )	15	36
	K-8	From Pennyfarthing roof, looking west ( <i>signs 12,13,15,16,17</i> )	16	37
Seymour Creek	S-1	From Seymour Parkway, looking east ( <i>sign 22</i> )	17	38
	S-2	From Seymour Parkway, looking west ( <i>signs 22 &amp; 23</i> )	18	39
	S-3	From Seymour Blvd., looking north ( <i>signs 23</i> )	19	40
	S-4	From Hwy. 1, looking southwest ( <i>sign 26A</i> )	20	41
	S-5	From Main Street, looking east ( <i>sign 26A</i> )	21	42
	S-6	From Ironworkers' Memorial Bridge, looking south ( <i>sign 26</i> )	22	43
	S-7	From Ironworkers' Memorial Bridge, looking north ( <i>sign 26</i> )	23	44
	S-8	From Hwy 1, looking north ( <i>signs 24 &amp; 25</i> )	24	45
	S-9	From Hwy 1, looking south ( <i>signs 24 &amp; 25</i> )	25	46

Different rating scales can be used. An assessment of the visual quality of each key view before the project is provided in Table 7, below:

**Table 7: Visual Quality Ratings Before Project**

Key View #	Description of Visual Quality	Visual Quality Rating before project
C-1	<u>Low</u> vividness (memorability); <u>low</u> intactness based on various encroaching features; <u>moderate</u> unity based on half of key view being uniformly vegetated.	LOW
C-2	<u>Low</u> vividness (memorability); <u>moderate</u> intactness based on few encroaching features; <u>moderate</u> unity based on uniform vegetation.	MODERATE TO LOW
C-3	<u>Low</u> vividness (memorability); <u>low</u> intactness based on various encroaching features; <u>moderate</u> unity based on half of key view being uniformly vegetated.	LOW
K-1	<u>High</u> vividness (memorability) as entranceway to city; <u>moderate</u> intactness based on openness to sky; <u>moderate</u> unity based on repeating forms (banners, lights, bridge railing)	MODERATE
K-2	<u>Moderate</u> vividness (memorability); <u>high</u> intactness based on uniform stand of vegetation; <u>high</u> unity based on intact vegetation.	HIGH
K-3	<u>Low</u> vividness given absence of major feature in field of view; <u>moderate</u> intactness based on heterogeneity of uses; <u>moderate</u> unity based on general similarity in scale of buildings.	MODERATE TO LOW
K-4	<u>High</u> vividness given beach and water; <u>high</u> intactness given relative absence of large encroaching features; <u>moderate</u> unity based on diversity of uses on opposite shore.	HIGH
K-5	<u>High</u> vividness given presence of water; <u>moderate</u> intactness since bridge breaks otherwise unencumbered view; <u>high</u> unity given uniformity of boat moorage use in both fore- and background;	HIGH
K-6	<u>High</u> vividness based on height above ground; <u>moderate</u> intactness based on complexity of patterns all sharing approximate background scale; <u>moderate</u> unity based on compositional harmony of cityscape.	MODERATE
K-7	<u>High</u> vividness based on height above ground; <u>moderate</u> intactness based on complexity of patterns all sharing approximate background scale; <u>moderate</u> unity based on compositional harmony of cityscape.	MODERATE
K-8	<u>High</u> vividness based on height above ground and water present in view; <u>moderate</u> intactness based on complexity of patterns all sharing approximate background scale; <u>high</u> unity based on Howe Sound background (compositional unifier).	HIGH

Key View #	Description of Visual Quality	Visual Quality Rating before project
S-1	<u>Low</u> vividness (memorability); <u>low</u> intactness based on presence of aggregate facility; <u>moderate</u> unity based on presence of uniformity of surrounding vegetation.	LOW
S-2	<u>Low</u> vividness (memorability); <u>low</u> intactness based on presence of aggregate facility; <u>moderate</u> unity based on presence of uniformity of surrounding vegetation.	LOW
S-3	<u>Low</u> vividness (memorability); <u>low</u> intactness based on presence of traffic signal and electrical infrastructure; <u>moderate</u> unity based on presence of uniformity of surrounding vegetation.	LOW
S-4	<u>Low</u> vividness (memorability); <u>low</u> intactness based on encroaching signage; <u>low</u> unity based on diversity of land uses.	VERY LOW
S-5	<u>Low</u> vividness (memorability); <u>low</u> intactness based on encroaching signage and electrical infrastructure; <u>low</u> unity based on diversity of land uses.	VERY LOW
S-6	<u>High</u> vividness (memorability) based on widening vista and open sky; <u>low</u> intactness based on highway infrastructure encroachments, <u>moderate</u> unity based on expanse of sky visible in view.	MODERATE TO LOW
S-7	<u>High</u> vividness (memorability) based on mountains in background; <u>moderate</u> intactness based on paucity of encroachments; <u>high</u> unity based on uniformity of vegetation receding to mountain background.	HIGH
S-8	<u>High</u> vividness (memorability) based on mountains in background; <u>low</u> intactness based on highway signage and bridge bisecting landscape; <u>high</u> unity based on uniformity of vegetation receding to mountain background.	MODERATE TO HIGH
S-9	<u>Low</u> vividness (memorability) based on lower elevation and absence of striking features in distance; <u>moderate</u> intactness based on uniformity of landscape and signage features; <u>high</u> unity based on highway curvature	MODERATE TO LOW

Viewer perception is discussed in Section 7.0 (Consultation).

#### 5.2.4 Recreation

Recreational activities on-reserve are limited at each location. Adjacent to the Kitsilano location, however, the north and south shores of False Creek host a continuous seawall that is heavily used for recreational purposes throughout the year. Sunset Beach on English Bay is also heavily used for recreation and is a location for a number of public events, including an annual fireworks festival (the Festival of Light).

### 5.2.5 Traffic Safety

Traffic safety assessments follow a standard methodology, with Canadian assessments following the methodology established by the U.S. Department of Transportation (DOT). A transportation assessment prepared by an expert in the field of traffic safety assessments associated with roadside signage, Dr. Robert J. Claus, is attached in Appendix 4.

This report addresses safety as it relates to visual distractions. Dr. Claus' findings are that sign locations and dimensions are suitable to "allow for quick comprehension of an advertising message and development of memory without distracting the driver from the driving task ... none of the signs posed any risk of blockage of traffic control devices, other vehicles, or any other objects fundamental to the driving task...the locations would [not] indicate a safety concern related to the physical structures or locations of the proposed signs."

An engineering report by Morrison Hershfield is also included in Appendix 4. It indicates that the proposed signs meet the Transportation Association of Canada Geometric Design for Canadian Roads (1999) requirement.

## 6.0 IMPACT ASSESSMENT

This section addresses potential environment effects of the project. The goal is to assess whether or not potential effects are adverse, significant and likely, and if environmental management measures are needed to minimize the effect.

Under CEAA, the environmental effects of the project must be assessed. CEAA defines environmental effect as:

- (a) *any change that the project may cause in the environment, including any change it may cause to a listed wildlife species, its critical habitat or the residences of individuals of that species, as those terms are defined in subsection 2(1) of the Species at Risk Act,*
- (b) *any effect of any change referred to in paragraph (a) on*
  - (i) *health and socio-economic conditions,*
  - (ii) *physical and cultural heritage,*
  - (iii) *the current use of lands and resources for traditional purposes by aboriginal persons, or*
  - (iv) *any structure, site or thing that is of historical, archaeological, paleontological or architectural significance, or*
- (c) *any change to the project that may be caused by the environment, whether any such change or effect occurs within or outside Canada*

This section contains:

- The methodology used in the assessment; and
- An effects assessment of:
  - Each VEC (see Section 3.5);
  - CEAA-related components:
    - Accidents and malfunctions;
    - Effects of the environment on the project; and
    - Cumulative environmental effects.

### **6.1 Effects Assessment Methodology**

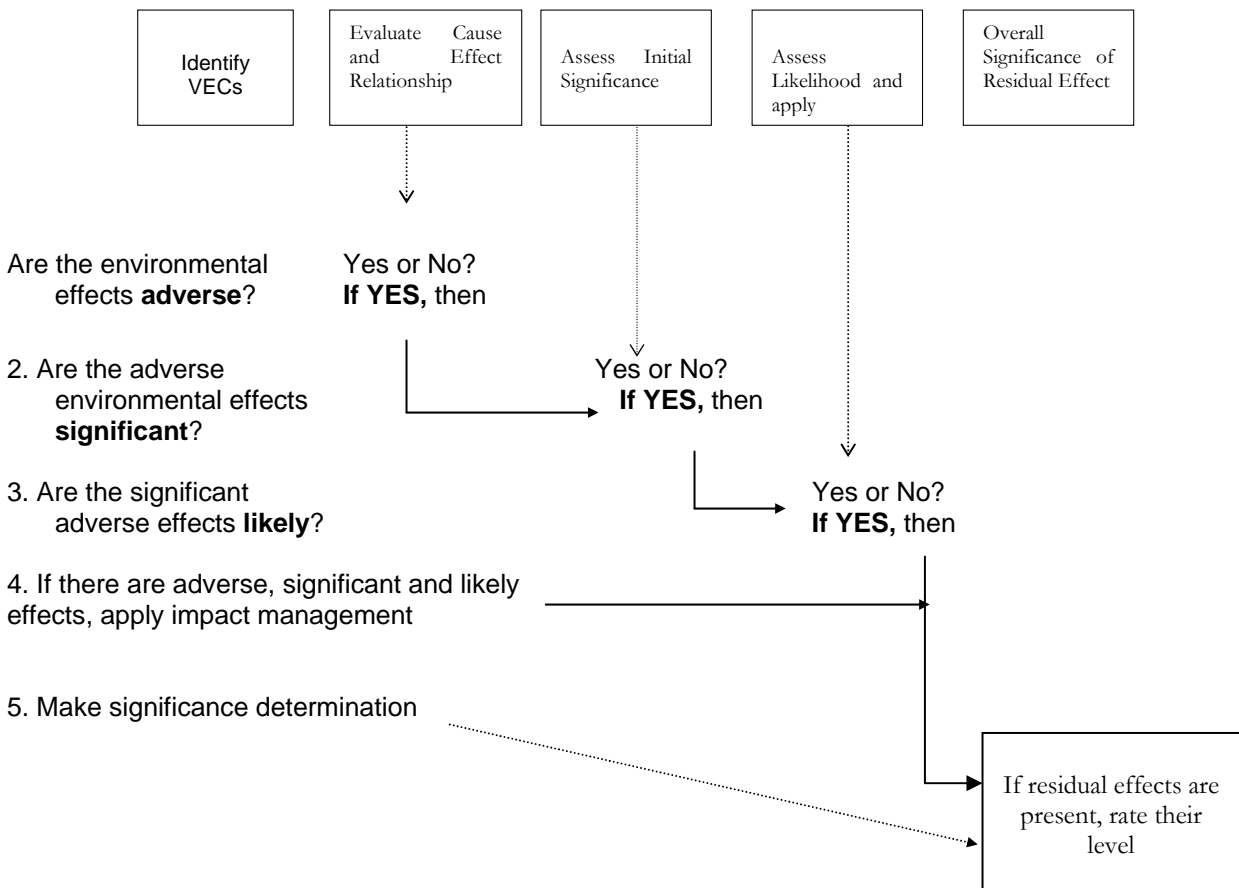
The effects assessment focuses on identifying project activities with the potential to cause effects on VECs. An evaluation of the adversity, significance and likelihood for the effects related to each VEC leads to an assessment of the overall significance of the effect. Effects that are adverse, significant and likely are of overall significance and need to be further reviewed to determine if they can be mitigated.

The methodology for the effects assessment is framed by the three CEAA questions:

- Are the environmental effects adverse?
- Are the adverse environmental effects significant?
- Are the significant and adverse environmental effects likely?

For an effect to be considered of residual significance, the answer to all three questions must be YES, as illustrated in Figure 26. This methodology has been adapted from the CEAA guidebook (CEAA, 1994) and represents a transparent, defensible breakdown of the assessment of environmental effects.

Figure 26: Flow Chart of Effects Assessment Process



### 6.1.1 Determining Adverse Effects

The first step in the effects assessment process is to determine if there is a potential adverse effect. This involves examination of the possible cause and effect relationship between a project activity and an effect on a VEC. Where there is reason to believe that there is a causal relationship, it is decided whether or not the effect is adverse (i.e., produces a negative effect on the environmental condition of the VEC). Adverse effects are considered at the next stage (Determination of Significance). For the purpose of this assessment, decommissioning was assumed not to be adverse since all above-ground infrastructure would be removed and below-ground concrete is assumed to be inert. All other potential impacts were assumed to be adverse and were carried forward to the next step of the screening process.

### 6.1.2 Determining Initial Significance

Determination of significance involves professional judgement and subjectivity. In an attempt to bring some precision to the term, a set of measures of significance has gained general acceptance (CEAA, 1994). The measures of significance proposed for this assessment are:

Geographic extent	<i>Over how large an area does the adverse effect occur?</i>
Duration	<i>Once triggered, how long does the adverse effect last?</i>
Frequency	<i>How often does the adverse effect occur during the entire time of the project phase?</i>
Magnitude	<i>How severe is the effect?</i>

In this assessment, duration, frequency and reversibility will be considered part of the temporal extent of the effect. The framework for the initial significance assessment and how several measures of significance are considered, is proposed below. Along with determinations of adversity and likelihood, significance is considered in the evaluation of overall significance. The table below indicates that there are eight possible outcomes of the test for initial significance. Four of these are considered significant and require further consideration through impact management.

**Table 8: Outcomes of the Test for Initial Significance**

(H=High, L=Low)

Geographic Extent	Temporal Extent	Magnitude	Description of the Potential Effect	Initial Significance?
H	H	H	A strong effect that is long-lasting and/or frequent, and covers a large area.	YES
H	H	L	A weak effect that is long-lasting and/or frequent, and covers a large area.	YES
H	L	H	A strong effect that covers a large area, but does not last long or occur frequently.	YES
L	H	H	A strong effect that is long-lasting and/or frequent, but does not cover a large area.	YES
H	L	L	A weak effect that covers a large area, but does not last long or occur frequently.	NO
L	H	L	A weak effect that is long-lasting and/or frequent, but does not cover a large area.	NO
L	L	H	A strong effect that is not long-lasting and/or frequent, and does not cover a large area.	NO
L	L	L	A weak effect that is not long-lasting and/or frequent, and does not cover a large area.	NO

### 6.1.3 Definition of Terms

For this assessment, the terms used to assess the potential effects are defined below. To qualify an effect in these terms, we use a combination of:

- Scientific site-specific evidence;
- Available information from similar observed effects; and
- Professional judgement, using precaution whenever necessary.

#### Geographic Extent

*Over how large an area does the adverse effect occur?*

<b>Term</b>	<b>Definition</b>
High	The effect occurs in an area $\geq 25\%$ of the study area.
Low	The effect occurs in an area $< 25\%$ of the study area.

#### Temporal Extent

*Once triggered, how long does the adverse effect last, and how often does it occur?*

<b>Term</b>	<b>Definition</b>
High	The effect is long-lasting, and/or occurs frequently.
Low	The effect neither lasts long, nor occurs frequently.

#### Magnitude

*How large is the effect relative to the geographic area?*

<b>Term</b>	<b>Definition</b>
High	The effect causes a $\geq 25\%$ change in the VECs abundance/function/process/value.
Low	The effect causes a $< 25\%$ change in the VECs abundance/function/process/value.

### 6.1.4 Determination of Likelihood

The determination of likelihood uses probability data, where available, to predict the chance that a particular effect might occur. Where probability data is not available, professional judgement is applied based on an understanding of past scenarios that are similar to those presented here.

### 6.1.5 Initial Significance

The assessment determines if the effects are adverse, significant, and likely. Effects that are not found to be adverse/significant/likely will be eliminated from further consideration. Those effects found to be of initial significance, will be evaluated to find ways to reduce impacts through impact management.

### 6.1.6 Impact Management

Those effects that are found to be adverse, significant and likely are judged to have an effect with an overall initial significance and management measures that may reduce the effects are considered. The impact management measures can range from avoidance of impacts (i.e., move a footing), to design changes, to mitigation. In the following section, for every VEC where an initial significance has been determined, the impact management measures will be discussed. Following application of mitigation measures, effects are reassessed to determine residual or post-mitigation impacts.

### 6.1.7 Residual Effects

Residual effects are those remaining after the application of impact management associated with the project, which are considered unavoidable. They may be ranked as follows:

**Table 9: Level of Residual Impact after Mitigation Measures**

Level	Definition
Low	Potential effect may result in a slight decline in resource in study area during the life of the project, but the resource should return to baseline levels. Research, monitoring, and/or recovery initiatives would not normally be required.
Medium	Potential effect could result in a decline in resource to lower-than-baseline but stable levels in the study area after project closure and into the foreseeable future. Regional management actions such as research, monitoring and/or recovery initiatives may be required.
High	Potential effect could threaten sustainability of the resource and should be considered a management concern. Research, monitoring, and/or recovery initiatives should be considered.

## 6.2 Effects Assessment by VEC

The effects assessment for each VEC is presented below. A discussion of initial significance is presented first. Where the expected effect is of overall significance, impact management is recommended. This is followed by a significance determination and an assessment of residual impacts, as per Table 9. A summary of the effects assessment for each VEC is presented in tabular form at the end of this section.

### 6.2.1 Topography

As indicated in Table 10 below, with one exception, topography will not be altered by the project. At Site 26A, a stockpile of fill will be removed or regarded but will have no significant overall effect.

**Significance:** The adverse effects of the project on this VEC are not significant.

### 6.2.2 Climate/Air Quality

Construction may result in minor elevations in dust and particulate levels but these are expected to be minor compared to background levels. During operation, the project will have a minimal to no effect on site climate and air quality.

**Significance:** The adverse effects of the project on this VEC are not significant.

### 6.2.3 Land/Soil (including contaminated sites concerns)

As indicated above, soil will be excavated and removed to permit the construction of sign footings. Quantities of materials removed are expected to be relatively small and in some cases represent removal of anthropogenic fill. In the case of sites on the Kitsilano IR, where contaminants are expected, independent remediation has been designed to ensure conservative management of contamination, if any, and minimize effects of the signs on more comprehensive environmental remediation. The remediation program, scoped with input from Tim Powers, Environmental Advisor for INAC, will involve extensive testing of soils within the proposed footprint of all footings at the Kitsilano location as they are being excavated to ensure that:

- All material removed to make way for the footings is properly disposed of; and
- The sign footings are not a significant impediment to any future remediation.

The workplan for managing contaminants at the Kitsilano location is attached as Appendix 5.

It is PGL's opinion (W. Gaherty, P.Eng., and member of the B.C. Roster of Professional Experts) that the proposed remediation program exceeds the standard of care for these contaminants as set out by the BC Ministry of Environment. Based on the proposed remediation approach, a net benefit to land and soils is anticipated as a result of the proposed project.

**Significance:** The adverse effects of the project on this VEC are not significant.

### 6.2.4 Surface Water

All signs except sign 23 are not located near surface water and are thus expected to have no impact on this VEC. Sign 23 is located near a permanent depression hosting mossy vegetation.

**Significance Determination:** The adverse effects of the project on this VEC are not significant. Efforts to minimize impact to the wetted area at Sign 23 to avoid habitat disruption should be included as part of the construction

plan. These are discussed in section 6.3. With mitigation, the overall impact of the project on this VEC is low.

### 6.2.5 Groundwater

Groundwater can reasonably be expected to be encountered at some sites at each location but any effect on groundwater will be transient during construction.

**Significance Determination:** The adverse impacts of the project on this VEC are not significant. Nevertheless, it is recommended that precautions should be taken with machine operation and materials storage to ensure no contaminants enter the water system. These precautions are discussed in section 6.3. The overall impact of the project on this VEC is low.

### 6.2.6 Flora

At the Capilano location, 3600 m<sup>2</sup> of vegetation will be cleared to improve sign visibility. At the Kitsilano location, 700 m<sup>2</sup> (canopy area) of vegetation will be cleared to improve sign visibility. At the Seymour location, 1150 m<sup>2</sup> of vegetation will be cleared to improve sign visibility.

**Significance Determination:** As discussed above, most of the native vegetation at each location has been heavily disturbed or removed, thus the adverse impact of the project on this VEC is not significant. Any vegetation, however, has greater habitat value in an urban setting than the same type of vegetation would have in a rural or wild setting, thus it is recommended that landscaping using native species that will neither make maintenance more difficult nor impair sign visibility, should be considered. The overall impact of the project on this VEC is low. Depending on the species chosen for landscaping, the impact of this project could represent a net benefit to the environment.

### 6.2.7 Fauna

This section examines impacts on two distinct groups: avifauna (birds) and all other fauna.

#### 6.2.7.1 Avifauna

Many birds have adapted well to the urban environment and to periodic structural changes within that urban landscape. Nevertheless, the addition of new features can cause temporary or permanent disruption to flight patterns and the addition of certain types of lighting can cause disorientation. In particular, the addition of high intensity lighting to the night-time landscape could cause seasonal disruptions to flight patterns. This is particularly true in less urban areas where background light levels are low. For this project, for example, light

impacts are expected to be greatest at the remote Seymour signs and lowest in the Burrard Bridge corridor.

**Significance Determination:** There is the potential for the effects of the project on this VEC to be significant. It is recommended that a monitoring program for night-time strikes during spring and fall migration seasons be established for the first year following installation of the signage. If the monitoring program reveals an adverse impact to bird species, a mitigation program may be required. Following implementation of mitigation, as needed, the overall impact of the project on this VEC is low.

#### 6.2.7.2 All Other Fauna

The large mammals normally present in the environment are not expected to be present at any of the project locations, except perhaps, as transients through the Seymour IR. Other species potentially inhabiting each location include: coyote (*Canis latrans*), raccoon (*Procyon lotor*), rat (*Ratus norvegicus*), and mouse (*Mus musculus*) as well as soil invertebrates, insects, rodents and feral, or stray, cats and dogs. Given the extent to which clearing and urban development has occurred, the fauna inhabiting the sites and adjacent areas are likely to be accustomed to development and human activity.

**Significance:** The project is not expected to impact these species beyond marginal localized changes to the landbase. The adverse environmental impacts of the project on this VEC are therefore not significant.

#### 6.2.8 Species at Risk

No species at risk have been identified in any of the project locations.

**Significance:** The potentially adverse effects of the project on this VEC are not significant.

#### 6.2.9 Land Use

The proposed project is bound by a contract entered into by the Squamish Nation allowing the project to be decommissioned should the Nation Council determine a higher and better use for the site. Therefore the land use impacts are considered to be largely limited to the surrounding uses.

**Significance Determination:** The adverse effects of the project on this VEC are not known but the presence of billboards may diminish the perceived value of surrounding lands, and potentially negatively impact surrounding businesses due to the public dislike for billboards. Given that the project itself is the source of the adverse impact, and the impact is partially the

purpose of the project, mitigation is not an option. The overall impact of the project on this VEC is assessed as medium.

#### 6.2.10 Cultural Resources, Traditional Use and Archaeology

The AIA determined that there are no archaeological sites or heritage resources within the study radius for each site. It noted that the historic activity in the area of the Kitsilano sites (including the massive works associated with the construction of the Burrard Street Bridge in the early 1930s) have so disturbed the area that there is very little likelihood that archaeological or heritage resources remain in the project location. The AIA concluded that the project could proceed without further concern for archaeological or cultural heritage resources.

Following the completion of the AIA, changes were made to the sign designs resulting in footings that are up to 10 feet (3.1m) larger in either direction and up to 2 feet (0.6m) deeper than those reviewed in the AIA. The archaeologist responsible for the AIA was consulted regarding this change in January 2007 (S. Kaltenreider, pers. comm.). Due to changes in footing sizes, the AIA recommends monitoring of all further footing excavation by a qualified archaeologist assisted by a member of the Squamish Nation, with power to halt construction work if archaeological materials are encountered; and, that additional sign locations are not pursued without the prior consultation of a qualified archaeologist, except for minor adjustments from the original locations assessed in this study.

The full AIA is attached as Appendix 6.

**Significance Determination:** Assuming the monitoring program prescribed by the consulting archaeologist is followed, the adverse effect of the project on this VEC is not expected to be significant.

#### 6.2.11 Aesthetics – The Visual Resource

Imagery prepared by Absolute 3D Digitizing Center (Figures 27 through 46) was used as the basis for determining changes to visual quality expected as a result of the project. These changes are indicated in Table 10, below.

**Table 10: Visual Quality Ratings After Project**

Key View #	Description of Visual Quality	Visual Quality Rating after project
C-1	Vividness (memorability) increased from low to <u>moderate</u> , especially at night, given additional lighting; <u>low</u> intactness based on various encroaching features; unity reduced from moderate to <u>low</u> , particularly at night, given tree clearing and presence of signs against vegetated backdrop.	LOW (unchanged)
C-2	Vividness (memorability) increased from low to <u>moderate</u> , especially at night given brightness of sign; intactness reduced from moderate to <u>low</u> , particularly at night, given addition of sign; unity reduced from moderate to <u>low</u> based on pattern disruption.	LOW (reduced)
C-3	Vividness (memorability) increased from low to <u>moderate</u> , especially at night given brightness of sign <u>low</u> intactness based on various encroaching features; unity reduced from moderate to <u>low</u> based on pattern disruption.	LOW (unchanged)
K-1	<u>High</u> vividness (memorability) as entranceway to city; intactness reduced from moderate to <u>low</u> based on encroachment of signs; unity reduced from moderate to <u>low</u> based on addition of structures at irregular intervals between repeating forms.	MODERATE TO LOW (reduced)
K-2	Vividness (memorability) increased from moderate to <u>high</u> , especially at night; intactness reduced from high to <u>moderate</u> based on encroachment of signs; unity reduced from high to <u>moderate</u> based on addition of structures at irregular intervals between repeating forms.	MODERATE (reduced)
K-3	Vividness (memorability) increased from low to <u>moderate</u> , especially at night; intactness reduced from moderate to <u>low</u> based on encroachment of signs; unity reduced from moderate to <u>low</u> based on addition of structures against uniform vegetation.	LOW (reduced)
K-4	<u>High</u> vividness given beach and water; <u>high</u> intactness given relative absence of large encroaching features; <u>moderate</u> unity based on diversity of uses on opposite shore.	HIGH (unchanged)
K-5	<u>High</u> vividness given presence of water; <u>moderate</u> intactness since bridge breaks otherwise unencumbered view; <u>high</u> unity given uniformity of boat moorage use in both fore- and background;	HIGH (unchanged)
K-6	<u>High</u> vividness based on height above ground; intactness reduced from moderate to <u>low</u> based on encroachment from signs; unity reduced from moderate to <u>low</u> , especially at night, given changed city composition and lighting patterns in foreground.	MODERATE TO LOW (reduced)
K-7	<u>High</u> vividness based on height above ground; intactness reduced from moderate to <u>low</u> based on encroachment from signs; unity reduced from moderate to <u>low</u> , especially at night, given changed city composition and lighting patterns in foreground.	MODERATE TO LOW (reduced)

Key View #	Description of Visual Quality	Visual Quality Rating after project
K-8	<u>High</u> vividness based on height above ground and water present in view; intactness reduced from moderate to <u>low</u> based on encroachment from signs unity reduced from high to <u>low</u> , especially at night, given changed city composition and lighting patterns in foreground	MODERATE TO LOW (reduced)
S-1	Vividness (memorability) increased from low to <u>moderate</u> , especially at night; <u>low</u> intactness based on presence of sign in front of aggregate facility; <u>moderate</u> unity based on presence of surrounding vegetation.	MODERATE TO LOW (increased)
S-2	Vividness (memorability) increased from low to <u>moderate</u> , especially at night; <u>low</u> intactness based on presence of aggregate facility; unity reduced from moderate to <u>low</u> based on addition of structure against uniform vegetation backdrop.	LOW (unchanged)
S-3	Vividness (memorability) increased from low to <u>moderate</u> , especially at night; <u>low</u> intactness based on presence of traffic signal and electrical infrastructure; <u>moderate</u> unity based on presence of uniformity of surrounding vegetation.	MODERATE TO LOW (increased)
S-4	Vividness (memorability) increased from low to <u>moderate</u> , especially at night; <u>low</u> intactness based on encroaching signage; <u>low</u> unity based on diversity of land uses.	LOW (increased)
S-5	Vividness (memorability) increased from low to <u>moderate</u> , especially at night; <u>low</u> intactness based on encroaching signage and electrical infrastructure; <u>low</u> unity based on diversity of land uses.	LOW (increased)
S-6	<u>High</u> vividness (memorability) based on widening vista and open sky; <u>low</u> intactness based on highway infrastructure encroachments, unity decreased from moderate to <u>low</u> based on tree clearing and addition of structures to skyline.	MODERATE TO LOW (unchanged)
S-7	<u>High</u> vividness (memorability) based on mountains in background; intactness reduced from moderate to <u>low</u> based on addition of encroachments; unity reduced from high to <u>low</u> given disruption of mountain vista.	MODERATE TO LOW (reduced)
S-8	<u>High</u> vividness (memorability) based on mountains in background; <u>low</u> intactness based on highway signage and bridge bisecting landscape; unity reduced from high to <u>moderate</u> based on the layering of sign on top of uniform background vegetation.	MODERATE TO LOW (reduced)
S-9	Vividness (memorability) increased from low to <u>moderate</u> , especially at night; <u>moderate</u> intactness based on uniformity of landscape and signage features; unity reduced from high to <u>moderate</u> based on addition of features on top of unified vegetation.	MODERATE (increased)

**Significance Determination:** Visual quality of six key views (C-1, C-3, K-4, K-5, S-2, S-6) is unchanged by the project. Visual quality is reduced in nine key views (C-2, K-1, K-2, K-3, K-6, K-7, K-8, S-7, S-8). Visual quality is increased in five key views<sup>1</sup> (S-1, S-3, S-4, S-5, S-9). For those views with reduced or increased quality, the impact of the project is considered significant. Supporting poles and ancillary structures have already been painted to blend with background colours and baffles that minimize night-time light escapement are standard mitigative features of this type of signage. Further changes to the signs to reduce impact are not possible since they would also compromise the signs' purpose as an advertising tool. The overall impact of the project on this VEC is assessed as medium.

### 6.2.12 Aesthetics – Viewer Perception

Viewers include drivers, cyclists and pedestrians passing the signs as well as residents and businesses located near the signs. Each group has two broad viewing periods: during daylight hours and during evening/night-time hours.

Viewer perception was solicited by Pace Group as part of the Consultation program developed for this project. The Pace report is appended as Appendix 8. In summary, however, an overwhelming majority of the comments received suggest significant opposition to the project. Of those respondents opposed to the project, most were opposed on the grounds that the signs would impair the beauty of the landscape.

**Significance Determination:** The impact of the project on this VEC is significant. The effects are not mitigable since any changes that would reduce impact would also compromise the signs' purpose as an advertising tool. However, as indicated in Section 4.1 above, the proponent unilaterally decreased the number of sign locations at the project scoping stage in the expectation of negative viewer perception. The overall impact of the project on this VEC is assessed as high.

### 6.2.13 Recreation

The distance between the signs and vantage points for key views K-4 and K-5 suggests that during the day the signs will have minimal impact on recreation. At night, especially during evening events such as the Festival of Light, light escaping from the Kitsilano signs may reduce recreational experience.

**Significance:** The adverse effects of the project on this VEC are not significant. Nevertheless, for particularly popular night-time events like the Festival of Light show, where excess light detracts, mitigation may be appropriate.

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<sup>1</sup> Recall that visual quality is based on a qualitative assessment of the viewscape. Viewer perception is not included in the rating of visual quality. It is, instead, considered under section 6.2.12 (Viewer perception).

This could include a voluntary “dark” period during the fireworks presentation at the Kitsilano signs.

#### 6.2.14 Traffic Safety

Sign locations have been chosen based on the high volume of vehicular traffic passing each site. The traffic safety assessment by Dr. Jim Claus (Appendix 4) indicates that, contrary to public perception, the addition of tri-vision billboards of this nature in these locations will not compromise driver safety. The report by Morrison Hershfield, also in Appendix 4, indicates that the signs are “...in compliance with the requirements of Transportation Association of Canada Geometric Design for Canadian Roads.”

**Significance:** The impact of the project on this VEC is not significant.

#### 6.2.15 Summary of Effects Assessment Impacts, by VEC

A summary of the assessments in sections 6.2.1 to 6.2.14 is presented in Table 11, below.

**Table 11: Effects Assessment of Project**

VEC	Geographic Extent	Temporal Extent	Magnitude	Initial Significance?	Residual Impact (impact after mitigation)
<b>Biophysical Resources</b>					
Topography	L	L	L	NO	-
Climate/Air Quality	L	L	L	NO	-
Land/Soil	L	L	L	NO	NET BENEFIT
Surface Water	L	L	L	NO	-
Groundwater	L	L	L	NO	-
Flora	L	H	L	POTENTIAL	POSSIBLE NET BENEFIT
Fauna – avifauna	L	H	H	POTENTIAL	LOW
Fauna – other	L	H	L	NO	-
Species at Risk	L	L	L	NO	-
<b>Socioeconomic Resources</b>					
Land Use	L	H	unknown	YES	MEDIUM
Cultural Resources, Traditional Use, Archaeology	L	L	L	NO	-
Aesthetics: Visual Resources	L	H	H	YES	MEDIUM

VEC	Geographic Extent	Temporal Extent	Magnitude	Initial Significance?	Residual Impact (impact after mitigation)
Aesthetics: Viewer Perception	L	H	H	YES	HIGH
Recreation	L	L	L	NO	-
Safety	L	L	L	NO	-

### 6.3 Impact Management

Impact management measures suggested in Section 6.2 is summarized in Table 12 below.

**Table 12: Proposed Impact Management for Project**

VEC	Location	Mitigation
Surface water	23	Implement stormwater management program during construction to ensure that no deleterious sediments enter the wetted area.
Groundwater	All	Implement stormwater management program during construction to ensure that no deleterious sediments enter the wetted area.
Flora		Implement landscaping program using native vegetation that will not obstruct signage.
Avifauna	All	Implement monitoring program. Consider mitigative measures on a location-specific basis depending on the outcome of the monitoring program.
Recreation	Kitsilano	Consider mitigation during heavily-attended night-time public events where lighting would reduce values significantly (i.e., during fireworks).

### 6.4 Cumulative Effects

The cumulative effects consider all of the combined effects of existing site developments/activities, the implementation of the proposed project and any other proposed developments or activities in the immediate vicinity.

At present, no additional signage is being contemplated by the proponent. If the proponent were to consider installation of additional signs on the Capilano, Kitsilano or Seymour locations, a cumulative impact assessment would need to be undertaken.

## 6.5 Effects of the Environment on the Project

Under CEAA, the impacts of the environment on the project must be considered. For this project, three key environmental factors were considered: weather, seismic conditions and climate change.

### 6.5.1 Weather

Two weather factors – rain and wind – are relevant to this project.

#### 6.5.1.1 Rain

As indicated in section 5.0, all project locations are located within the Lower Mainland Ecoregion which is characterized by a temperate, seasonally rainy climate. The annual average precipitation of 1,400mm is concentrated in the winter months (November to February), with peak monthly rainfall reaching up to 300mm in the rainiest month of the year (November).

In response to these environmental factors, the signs have been designed to comply with the requirements of the National Building Code as defined in Part 4: Structural Design, taking into account dead loads and live loads such as earthquake, snow and wind. Sign footings have been designed by a qualified engineer to provide, among other things, for adequate drainage from the superstructure and footing foundations. A maintenance program that includes regular painting to prevent rust will be implemented.

#### 6.5.1.2 Wind

Recent (2006/2007) wind storms in Vancouver have highlighted the destructive power of high winds. During the December 2006 storms, wind speeds peaked at 158km/hr. The signs are rated to withstand peak winds of between 173 and 194km/hour and each is located in an area appreciably more sheltered than open water areas where the highest winds were recorded in December 2006, suggesting that the signs are rated to handle extreme weather events associated with the present climate regime.

### 6.5.2 Seismic Conditions

The Lower Mainland of British Columbia is located within an active seismic zone. More than 200 earthquakes are recorded each year in the Lower Mainland and Vancouver Island.<sup>2</sup> Though most are too small to be felt, an earthquake capable of structural damage (approximately magnitude, or M, 6.0) can be expected to occur somewhere in the region about once every ten years.

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<sup>2</sup> <http://geophys.seos.uvic.ca/eqquakes.html>

The 2005 National Building Code requires structures to be designed to withstand an earthquake with probability of 0.000404 per annum, equivalent to a 2% probability of exceedence over 50 years. This means that over a 50-year period there is a 2% chance of an earthquake causing ground motion greater than the given expected value.<sup>3</sup> The signs comply with the requirements of the National Building Code according to the engineering firm responsible for their design.

### 6.5.3 Climate Change

A Ministry of Environment report<sup>4</sup> provides a summary of expected changes in British Columbia associated with climate change. Changes predicted for the Lower Mainland include increased evening and winter temperatures, increased winter precipitation and increased sea level.

Changes in temperature will not affect the project. Predicted increases of approximately 30mm in precipitation over the 30-year life of the project can be accommodated within the project's design specifications. Predicted sea level rise of 0.18–0.59m by 2099<sup>5</sup> will not raise the water table sufficiently to compromise sign footings at any location within the expected 30-year life of the project.

Climate change will therefore not affect this project.

## 7.0 PUBLIC CONSULTATION

CEAA requires that the public be informed about projects receiving a CEAA review, have an opportunity to comment on the project, and that the project proponents demonstrate a willingness to respond to the comments received.

Consultation for this project has been managed by the Pace Group. Three public open houses, advertised pursuant to requirements set out by CEAA, were held as follows:

**Table 13: Consultation Open Houses**

Date	Location	Number of Attendees
August 23, 2006	Canadian Memorial Centre for Peace, Vancouver	39
August 24, 2006	Squamish Nation Recreation Centre, North Vancouver	268

<sup>3</sup> [http://earthquakescanada.nrcan.gc.ca/hazard/zoning/haz\\_e.php](http://earthquakescanada.nrcan.gc.ca/hazard/zoning/haz_e.php)

<sup>4</sup> Indicators of Climate Change for British Columbia, BC Ministry of Environment, 2002

<sup>5</sup> Fourth Assessment Report of the Intergovernmental Panel on Climate Change, February 2007

More than 100 public comments, letters and e-mails were received and reviewed by the Pace Group. The majority of comments were critical of the project and the Squamish Nation's involvement in it. Key concerns noted in the public comments include:

- The potential for the signs to reduce traffic safety. Specifically, concerns were raised that signs would distract drivers and thus increase the frequency and severity of traffic accidents; and
- The effect of the signs on the visual landscape. Specifically, the public expressed a strong opinion that the signs were unattractive and would compromise public visual property.

The Squamish Nation sent a letter to affected municipalities indicating a willingness to meet to discuss the project, as indicated in Appendix 7. None of the municipalities responded to the letter. The consultation report, including all images presented to the public, all public comments received and all media coverage of the project, is attached as Appendix 8.

## **8.0 CONCLUSION**

This EIA suggests that the majority, but not all, of potential impacts associated with the Squamish Nation project to erect 13 trivision billboards in three locations around the Lower Mainland are not significant.

Specifically, all potential biophysical impacts are either insignificant or, with adequate mitigation, can be reduced to a "low" impact. Of greatest concern with respect to biophysical VECs is the fact that the night-time lighting required to illuminate the billboards may disorient avifauna. A program to monitor this effect should be established.

Impacts to three socioeconomic VECs – land use, visual resources, and viewer perception – have been determined to be significant. In these three cases, mitigation is not possible without compromising the purpose of the project. In the absence of mitigation, the residual impact on land use and visual quality are assessed as medium and the residual impact of the project on viewer perception is assessed as high.

## **9.0 STANDARD LIMITATIONS**

PGL prepared this report for our client and its agents exclusively. PGL accepts no responsibility for any damages that may be suffered by third parties as a result of decisions or actions based on this report.

The findings and conclusions are site-specific and were developed in a manner consistent with that level of care and skill normally exercised by environmental professionals currently practicing under similar conditions in the area. Changing assessment techniques, regulations, and site conditions means that environmental investigations and their conclusions can

quickly become dated, so this report is for use now. The report should not be used after that without PGL review/approval.

The project has been conducted according to our instructions and work program. Additional conditions and limitations on our liability are set forth in our work program/contract. No warranty, express or implied, is made.

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