City of Richmond

Report to Committee

To:	General Purposes Committee	**Date:**	August 30, 2016
From:	John Irving, P.Eng. MPA Director, Engineering	**File:**	10-6060-01/2016-Vol 01
Re:	**Vancouver Airport Fuel Delivery Project - Oil and Gas Commission Permit**		

Staff Recommendation

That the staff report titled "Vancouver Airport Fuel Delivery Project - Oil and Gas Commission Permit," dated August 30, 2016, from the Director, Engineering, which includes comments regarding the Vancouver Airport Fuel Facilities Corporation's application for the BC Oil and Gas Commission permit for the Vancouver Airport Fuel Delivery project, be endorsed for submission to the BC Oil and Gas Commission.

John Irving, P.Eng. MPA
Director, Engineering
(604-276-4140)

Att. 1

REPORT CONCURRENCE		
ROUTED TO:	**CONCURRENCE**	**CONCURRENCE OF GENERAL MANAGER**
Parks Services	☑	
Fire Rescue	☑	
Development Applications	☑	
Transportation	☑	
REVIEWED BY STAFF REPORT / AGENDA REVIEW SUBCOMMITTEE	**INITIALS:** DB	**APPROVED BY CAO** (ACTING)

Staff Report

Origin

The Vancouver Airport Fuel Facilities Corporation (VAFFC) letter to the City of Richmond, dated July 20, 2016, titled " Notification and Consultation" (Attachment 1) declares the VAFFC's intention to apply to the Oil and Gas Commission for permits to construct and operate the pipeline component of the Vancouver Airport Fuel Delivery (VAFD) project. The Oil and Gas Activities Act (the Act) and the Consultation and Notification Regulation requires the VAFFC to notify impacted stakeholders and receive their comments with respect to the VAFD project and this letter serves as that notification.

The consultation and notification process is legislated through the Act and Consultation and Notification Regulation and allows 21 days for stakeholders to comment through this process. Staff's request for extension of the comment period was denied and the Oil and Gas Commission indicated that there is no provision for extension in the Consultation and Notification Regulation. Staff provided comments to the VAFFC and the Oil and Gas Commission within the 21 days and a copy of the response with a covering memo was distributed to Council on August 3, 2016.

Outside of the consultation and notification process, the Act allows for written submissions to the Oil and Gas Commission regarding the VAFD any time prior to a decision on the Oil and Gas Commission application for a permit. This report reviews the consultation and notification letter and recommends comments for a written submission to the Oil and Gas Commission for Council's consideration. An update on the VAFFC Environmental Assessment Certificate Amendment process for the VAFD is being presented in a separate report on the same Committee agenda.

Analysis

Detailed Pipeline Information

The VAFFC consultation and notification letter provides high level information that is consistent with materials presented previously through the Environmental Assessment Certificate Amendment process. More detailed information will be required by the Oil and Gas Commission as part of their permit process and the City has requested that the VAFFC make this more detailed information available for the City's review prior to permit application. Staff has requested this information be made available to the City prior to the VAFFC application for Oil and Gas Commission permit and the VAFFC has verbally committed to do so. To date, the requested information has not been made available to the City. Staff recommend requesting the City be provided this information and given reasonable time to review and comment prior to Oil and Gas Commission decision regarding the permit application.

North Richmond

The VAFFC notification letter identifies three possible routes from Highway 99 to the Moray Channel. The routes are the same as those previously presented by the VAFFC and staff recommends that the City reiterate its strong preference for a pipeline route on Bridgeport Road.

Unopened Road Dedications

The VAFD project includes a proposed alignment in the unopened Francis Road dedication. Through the Environmental Assessment Certificate Amendment process, the City had requested that the pipeline be constructed in a manner that does not impact the City's future ability to build a road in its unopened dedications. The VAFFC response to this comment was that the Municipal Access Agreement will address location-specific installation requirements. There is currently no Municipal Access Agreement and staff recommend that the VAFFC commit to constructing the pipeline in a manner that does not impact the ability to build roads in its unopened dedications. If the issue is deferred to the Municipal Access Agreement, then the City should request that the Oil and Gas Commission decision regarding the permit application be deferred until the Municipal Access Agreement is executed.

Highway 99 and Parks

The George Massey Tunnel Replacement project team has indicated there would be surplus land east of Highway 99 that could be used for farming. Staff recommend that the City request the VAFFC to provide clarification on potential impacts of the pipeline on land east of Highway 99.

A section of the proposed alignment along the Highway 99 corridor is also in close proximity to the Nature Park East. Staff recommend that the City request the VAFFC to construct and operate the pipeline in a manner that does not impact the hydrology of the bog ecosystem on the Nature Park East.

Staff also recommend that the City request the VAFFC to construct and operate the pipeline in a manner that does not interfere with the current and future usage of the Bridgeport trail.

Pipeline Purpose

Staff recommend that the City reiterate concerns regarding the VAFD purpose through a request that the VAFD facilities and pipeline be limited to supplying jet fuel to Vancouver International Airport.

Comments

Staff recommend that the following comments on the proposed VAFD project pipeline be sent to the Oil and Gas Commission prior to their decision on the VAFFC application for the Oil and Gas Commision permit:

1. That the City continues to oppose the development of the VAFD project in its current configuration and that the options to deliver jet fuel directly to Sea Island be considered prior to implementation of the VAFD project;

2. That the City be given reasonable time to review and comment on the detailed information included in the Oil and Gas Commission permit application prior to Oil and Gas Commission decision;

3. That, if not directly delivered to Sea Island, the pipeline route in North Richmond be limited to the Bridgeport Road option due to the significant negative impacts to the future development of North Richmond inherent in the Bridgeport Trail and River Road options;

4. That pipelines constructed in unopened municipal road dedications be constructed in a manner that does not impact the City's ability to build roads on these dedications in the future. If this issue is deferred to the future Municipal Access Agreement, the City requests that decision on the Oil and Gas Commission permit be deferred until the Municipal Access Agreement is completed and executed;

5. That the VAFFC provide clarification on potential impacts of the pipeline on land east of Highway 99, which the George Massey Tunnel Replacement project team has indicated would be surplus land that could be used for farming;

6. That the VAFFC constructs and operates the pipeline in a manner that does not impact the hydrology of the bog ecosystem on the Nature Park East and does not interfere with the current and future usage of and improvements to the Bridgeport trail; and

7. That the VAFD installations and pipeline be limited to supplying jet fuel to YVR.

Financial Impact

None.

Conclusion

The VAFFC has issued notice to the City regarding its intention to apply to the Oil and Gas Commission for permit. The notification was required by the Act and the Consultation and Notification Regulation. A 21 day period for comment is required by the regulations and the City provided comments consistent with those provided through the Environmental Assessment Certificate Amendment process.

The Act allows for written comments to be received by the Oil and Gas Commission outside of the comment period but prior to Oil and Gas Commission decision on the permit. Staff recommend that Council endorse the comments in this report for written submission to the Oil and Gas Commission to be included in their decision making process.

Lloyd Bie, P.Eng.
Manager, Engineering Planning
(604-276-4075)

LB:lb

Att. 1: VAFFC Notification and Consultation letter, dated July 20, 2016

VAFFC / Vancouver Airport
Fuel Facilities Corporation
AN FSM GROUP LIMITED CORPORATION

July 20, 2016

Sent Via Courier

CITY OF RICHMOND
6911 NO. 3 ROAD
RICHMOND BC V6Y 2C1

RE: NOTIFICATION and CONSULTATION

Vancouver Airport Fuel Delivery Project
Pipeline System to Vancouver International Airport
Richmond, British Columbia

In compliance with the *Oil and Gas Activities Act* (**OGAA**) and the Consultation and Notification Regulation (**C&N Regulation**), this letter is to notify you that Vancouver Airport Fuel Facilities Corporation (**VAFFC**) intends to apply to the Oil and Gas Commission (**OGC**), commencing in 2016, for permits to construct and operate an aviation fuel pipeline system, and associated pipeline equipment, approximately 13 km in length (**"Pipeline"**) starting from *15040 Williams Road*, to the *Vancouver International Airport* (**YVR**) on Sea Island, B.C.

The C&N Regulation, and application for a permit under the OGC, are required for the transfer and delivery pipelines, and marine terminal elements located at 15040 Williams Road. For the purposes of this notification package and the application to the OGC, these elements are collectively identified as the "**Pipeline**". The Fuel Receiving Facility (as described below) require construction permits from other agencies.

Pursuant to the requirements under section 22 of the OGAA, this letter is to provide you with information on the project and maps showing the general location of the proposed Pipeline and in relation to your property.

Details of Proposed Project

General

VAFFC has received an Environmental Assessment Certificate from the provincial and federal governments for the Vancouver Airport Fuel Delivery Project. The project, as certified and amended (pending), consists of the following key components:

5. Deep water Marine Terminal on the Fraser River, capable of receiving up to Panamax class vessel shipments of aviation fuel;
6. 600mm diameter transfer pipe approximately 400 meters in length connecting the Marine Terminal to the Fuel Receiving Facility;

7. Fuel Receiving Facility, consisting of 6 storage tanks with a combined capacity of 80 million litres, as well as filtration, pumping and processing systems; and
8. A 13km long 355.6mm diameter delivery pipeline connecting the Fuel Receiving Facility to existing VAFFC storage systems at YVR.

Pipeline

The following table provides more specific information on the Pipeline system, consisting of items 1, 2, and 4 above, which will be detailed within the application to the OGC.

General Description of proposed Project:	The proposed Pipeline will consist of terminal equipment and pipeline infrastructure to transfer aviation fuel from marine vessels to a fuel receiving facility and pipeline infrastructure from the fuel receiving facility to the Vancouver International Airport. The pipeline infrastructure consists of a 400 meter 24" (609.6mm) receiving pipeline and a 13 km 14" (355.6mm) delivery pipeline. Pipeline infrastructure will be located on VAFFC owned or leased land, and within existing right of ways with the majority of the delivery pipeline located inside the right of way of Highway 99. The marine terminal elements include berthing, mooring, and containment structures to receive marine vessels, as well as offloading equipment such as loading arms, control valves, metering devices, and inline inspection systems to connect vessels to the 600mm transfer pipeline.
Delivery Pipeline - Alternate Routes South Richmond	Route A – starts at the marine terminal utilizing the 600mm pipeline to the fuel receiving facility and then after processing flows back through the marine terminal utilizing the 355.6mm pipeline prior to travelling north on Savage Road to connect to the Francis Road right-of-way.
	Route B – starts at the marine terminal utilizing the 600mm pipeline to the fuel receiving facility and exits the fuel receiving facility utilizing the 355.6mm pipeline travelling north paralleling the Cn Rail corridor prior to turning west onto the Francis Road right-of-way.

Delivery Pipeline - Alternate Routes North Richmond	Route A - starts at the intersection of Highway 99 and Bridgeport Road, goes West alongside Bridgeport Road, across the Moray Channel and to the existing facilities on Sea Island.
	Route B – starts at the intersection of Highway 99 and Bridgeport Road and goes Northwest alongside Highway 99 to Bridgeport Trail, to Van Horne Way, southwest along Van Horne Way to Charles, west to River Road and North West along No. 3 Road, then West across the Moray Channel to the existing facilities on Sea Island.
	Route C – the initial route same as Route B but will go South off River Road to connect to Bridgeport Road.
Pipeline Equipment	The pipeline system will be equipped with metering devices and emergency shut-down valves at termination points at the marine terminal, fuel receiving facility, Moray Channel crossing, and fuel storage facility at YVR.
Product	Jet Fuel (Jet A or Jet A1). Jet fuel is a colourless to straw-coloured clear liquid used by almost all commercial airlines worldwide. Similar to diesel fuel, it has a high flash point and low volatility and is considered a combustible rather than flammable liquid. As a refined product, it will almost completely evaporate over time.
Maximum H2S Level:	There is no H2S associated with this pipeline.
Phases	There will be two phases associated with this project. The first is the construction phase, which will include the cleanup of the construction areas. The second will be the operations phase which will include maintenance as set out in the Integrity Management plan.
Project Scheduling:	Construction of the proposed Pipeline (including clearing, soil handling, grading, trenching, testing and cleanup) is anticipated to begin in early 2017 (Subject to the receipt of regulatory approval). Construction phasing includes the following general segments: • 600mm transfer pipeline: 2 months • 355.6mm pipeline to Highway 99: 4 months • 355.6mm pipeline along Highway 99: 7 months • 355.6mm pipeline along Bridgeport Road: 3 months • 355.6mm pipeline across Moray Channel and YVR: 3 months • Some segment schedules may overlap, with a total anticipated construction period of twelve to eighteen months, beginning in early 2017. The proposed Project is expected to be in-service by late 2018.

Equipment Required:	Equipment for the construction of the proposed Project will include: regular pickup trucks, welding trucks, tracked excavators, pipe layers, dozers, side booms, dump trucks, tractor trailer units and horizontal drilling rigs.
Flaring/Incineration Operations:	There will be no flaring/incineration associated with the operation of the pipeline.
Noise:	Prior to construction VAFFC will have an approved Noise Management Plan in place. Noise will be monitored and managed in accordance with Richmond city bylaws, as well as special conditions contained in the EAC that are relevant to the Pipeline system. Once in-service, noise will be limited to vehicles involved in routine maintenance, occurring typically during business hours.
Traffic:	During the construction phase of the proposed Project there will be a slight increase in traffic along the route. VAFFC will work closely with the Ministry of Transportation and Infrastructure (MOTI) and the City of Richmond to manage various road and traffic strategies to ensure that impacts to public roads and related residents are minimized. Some of these strategies may include traffic control, dust control and coordination of access in sensitive areas. There will be some temporary traffic disruptions on St. Edwards Road, Bridgeport Road and as well as some portions of the undeveloped road allowance on Francis Road. Once construction is complete there will be minimal traffic during routine maintenance. Please see the attached "Road Used For Activities" map showing the main roads to be used during Construction and Reclamation.
Air Quality and Dust Control	Prior to construction VAFFC will have an approved Air Quality and Dust Control Management Plan. Construction equipment emissions will be monitored in accordance with conditions of the Environmental Assessment Certificate. Dust will be controlled within constructions sites along the Pipeline corridor with sweepers or suppressed with water spray. Once construction is complete there will be no dust or emissions associated with the normal operation of the Pipeline.
Safety	VAFFC takes safety very seriously. All activities associated with the design, construction and operation of the proposed Project will be conducted in accordance with applicable safety regulations, OGC requirements and VAFFC's and its contractor's safety programs. Prior to Construction VAFFC will have an approved Emergency Response Plan in place.

Consultation

As a person receiving this Notification, you may provide a written response to VAFFC within 21 days of receiving this notice, either:

iv) advising VAFFC that you do not object to the proposed Project, or

v) setting out the reasons why the proposed activities, that will be the subject of the applicant's application, should be modified, or

vi) request a meeting with VAFFC to discuss the proposed Project in more detail.

Please also note that pursuant to Section 22(5) of the OGAA you also have the ability to file a written submission directly to the OGC at any point, prior to permits being issued for the proposed Pipeline. Please consult the OGC's website and publications for more information on filing a written submission. The written submission form can be downloaded from the OGC website at (https://www.bcogc.ca/content/written-submission-form).

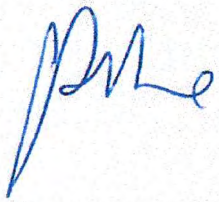
If your residence falls within the area of the Alternate Routes as described above we will inform you of the final route selection once we have decided on the optimum route.

VAFFC Contact

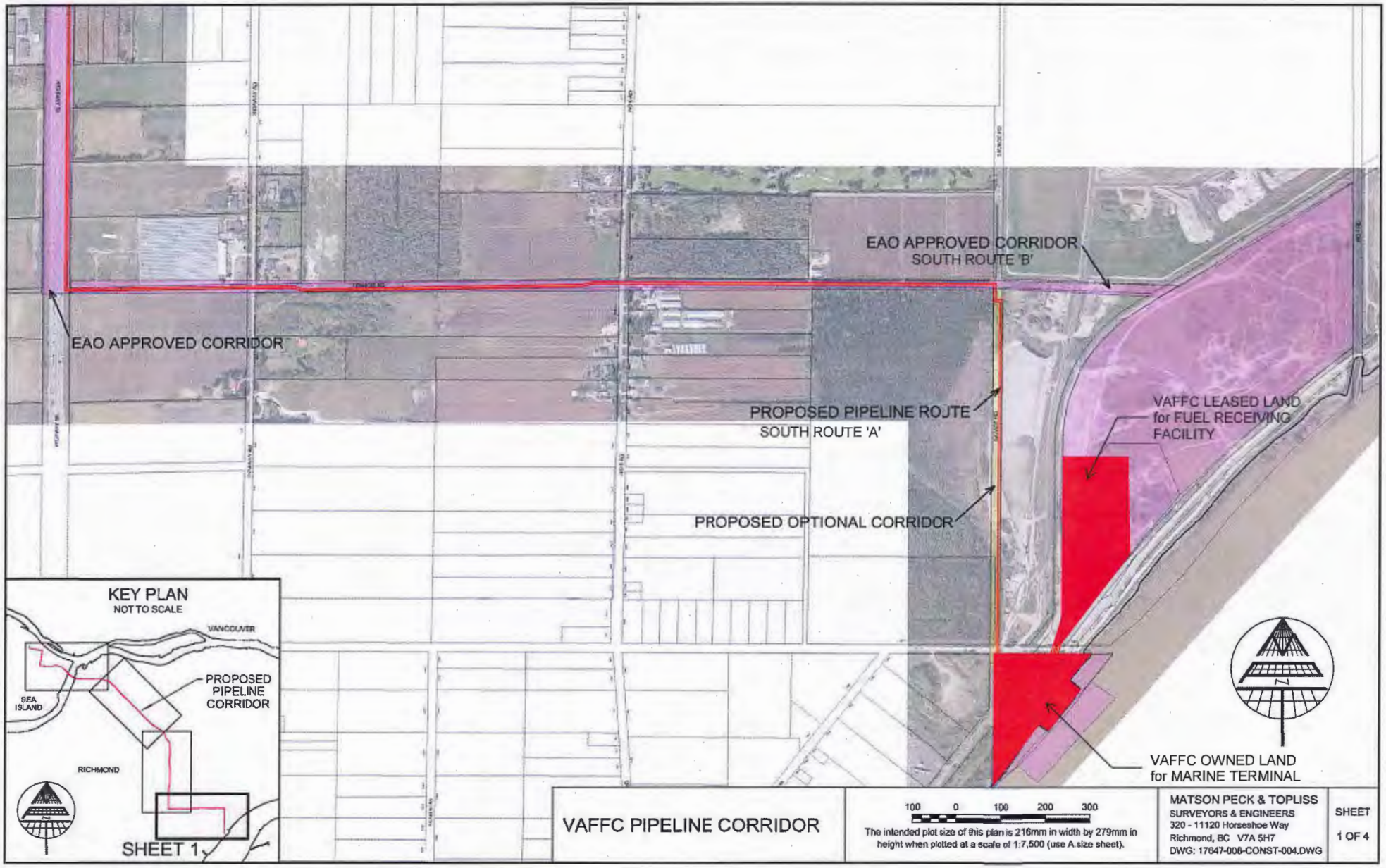
Any questions or objections regarding this project can be directed to the following:

Adrian Pollard, Project Director
Vancouver Airport Fuel Delivery Project
Box 34, 505 Burrard Street, Vancouver, BC V7X 1M4
Phone: 604-638-7463 Fax: 604-684-6981
Email: info@vancouverairportfuel.ca

Yours truly,
Vancouver Airport Fuel Facilities Corporation



Adrian Pollard, P.Eng.
Project Director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VAFFC LEASED LAND
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MATSON PECK & TOPLISS
SURVEYORS & ENGINEERS
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Richmond, BC V7A 5H7
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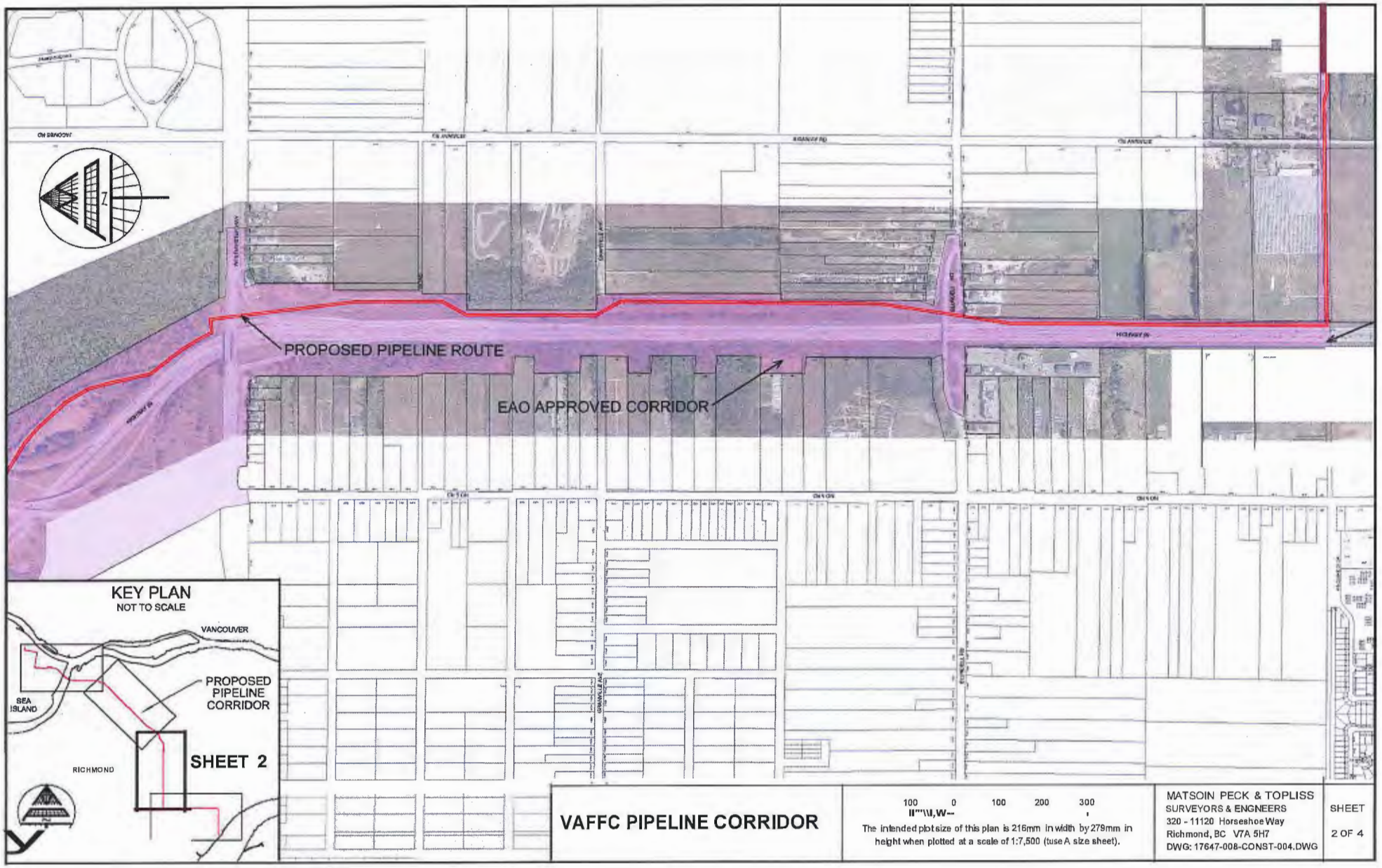
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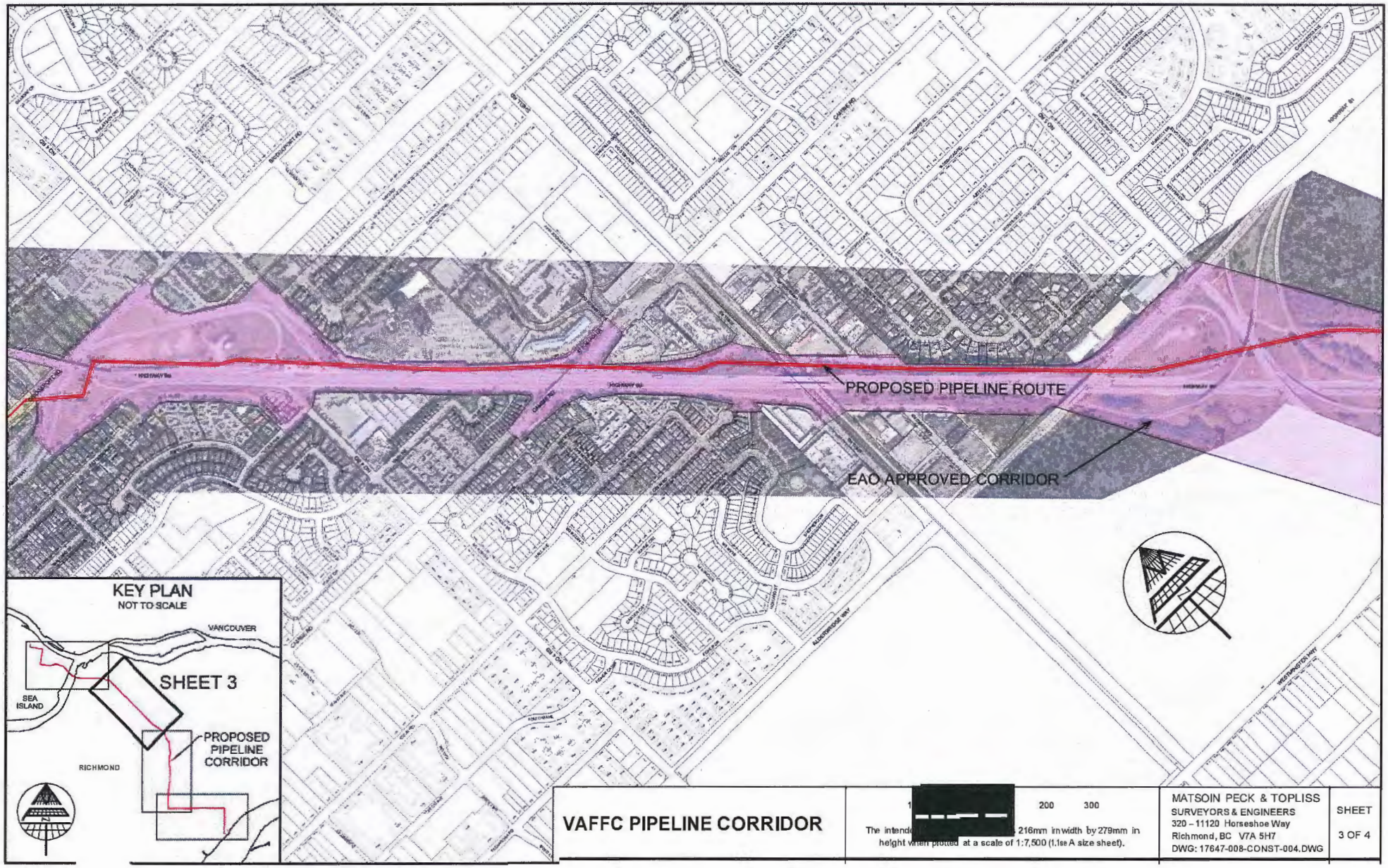
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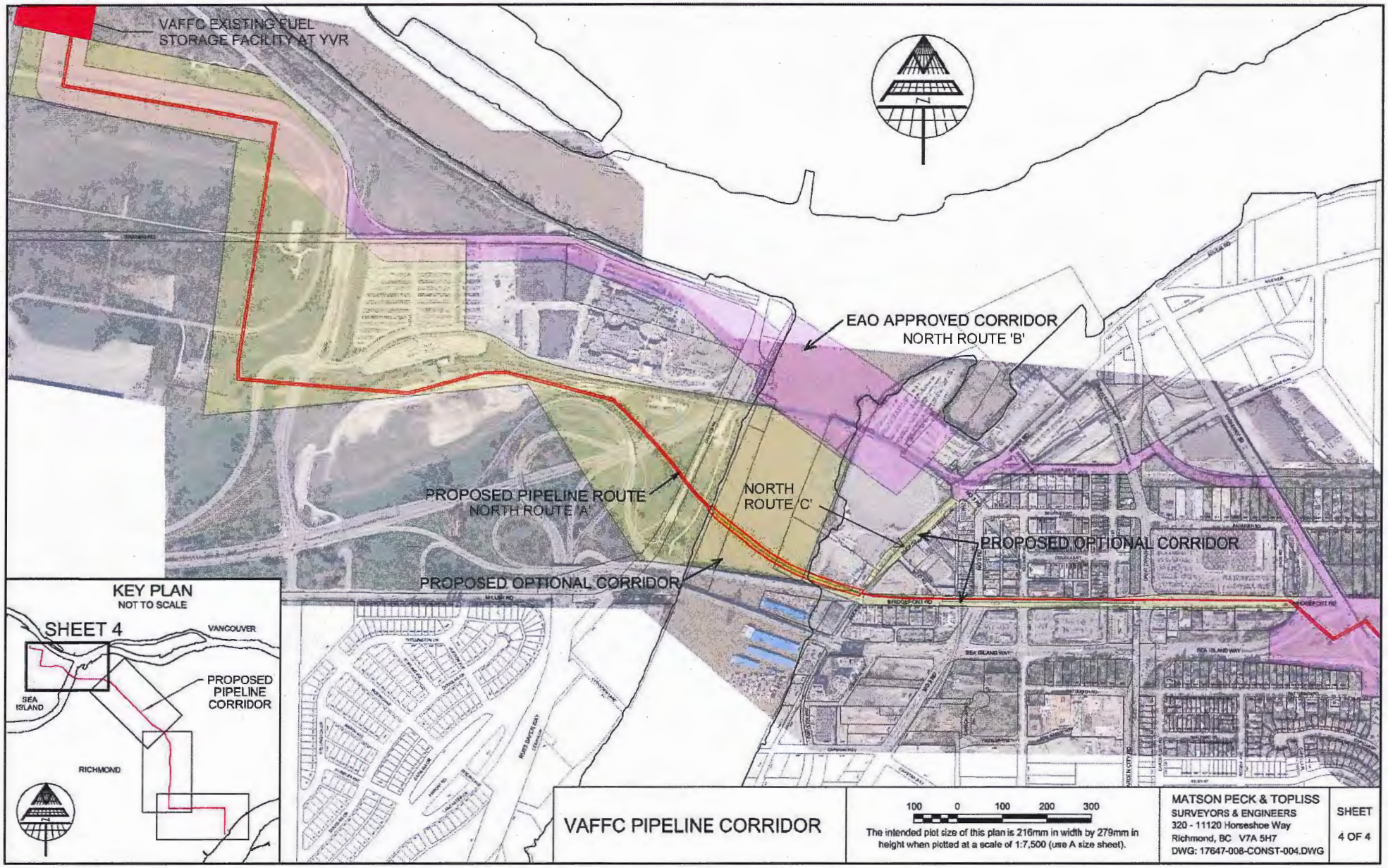
VAFFC EXISTING FUEL STORAGE FACILITY AT YVR
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PROPOSED PIPELINE ROUTE
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ROUTE 'C'
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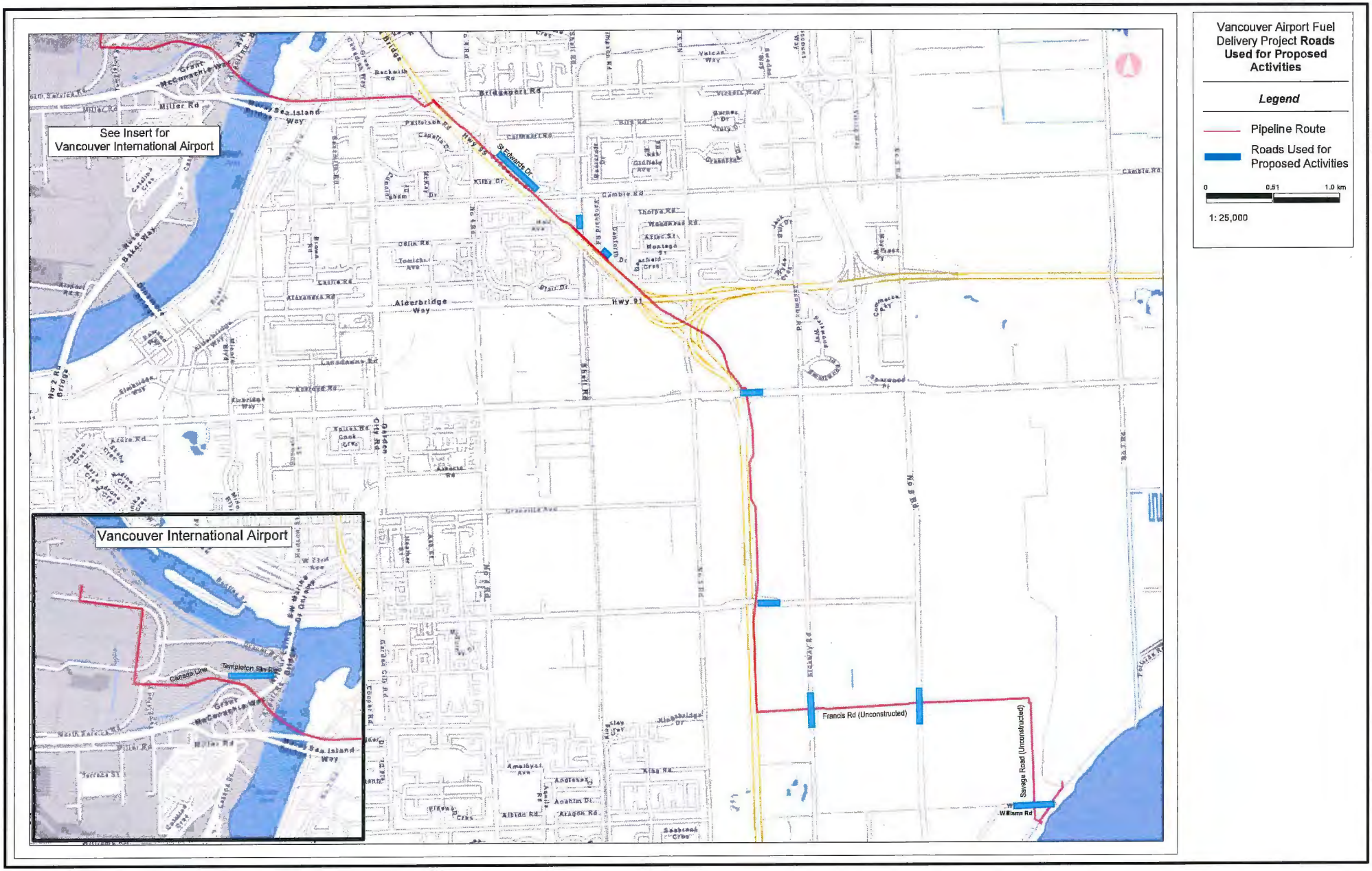
See Insert for Vancouver International Airport
Vancouver International Airport
Francis Rd (Unconstructed)
Savage Road (Unconstructed)
Vancouver Airport Fuel Delivery Project Roads Used for Proposed Activities
Legend
Pipeline Route
Roads Used for Proposed Activities
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Vancouver Airport
Fuel Facilities Corporation
AN FSM GROUP MANAGED CORPORATION

Vancouver Airport Fuel Delivery Project

ABOUT THE PROJECT

Vancouver Airport Fuel Facilities Corporation (VAFFC) is constructing a new aviation fuel delivery system to serve the airlines at Vancouver International Airport (YVR). It includes a Marine Terminal and Fuel Receiving Facility at existing industrial sites on the South Arm of the Fraser River and an underground pipeline connecting the facility with YVR.

In December 2013, following more than a decade of comprehensive planning, research, review and consultation by VAFFC, the project completed a comprehensive harmonized federal/provincial environmental assessment process, with the BC Environmental Assessment Office (EAO) coordinating the review requirements of both the Canadian Environmental Assessment Act and BC Environmental Assessment Act.

The assessment included Environment Canada, Transport Canada, Health Canada, Department of Fisheries and Oceans, Canadian Coast Guard, Canadian Wildlife Service, Natural Resources Canada, Canadian Transportation Agency, Port Metro Vancouver, 12 First Nations, Metro Vancouver, City of Richmond, Corporation of Delta, BC Oil & Gas Commission, BC Utilities Commission, BC Ministry of Environment, Ministry of Community, Sport & Culture and Vancouver Airport Authority.

On a stand-alone basis, the risks of this project are few and will be managed to insignificant levels with well understood and proven risk management methods, best practices and technology. On a comparative basis, the risks of this project are far less than the current fuel delivery methods and infrastructure.

PROJECT COMPONENTS

Marine Terminal

The new Marine Terminal will be located on the north shore of the south arm of the Fraser River, at one of the widest and deepest sections of the river. An upgrade of an existing wharf, in an area that is already zoned for heavy industrial use, will be based on best practice designs and incorporate state-of-the-art mooring and offloading technologies.

The marine terminal will be designed to handle small barge shipments and large overseas shipments. These will be short in duration and only a few times a month, based on projected YVR fuel demand. A barge could be expected to deliver fuel once every two weeks with an unloading time around 12 hours, while a Panamax class vessel could be expected once a month with an unloading time of between 24 to 36 hours.

Marine Terminal and Fuel Receiving Facility

Vessels:

- All vessels will be double-hulled for optimal safety
- All vessel movements will be guided by tugboats and government-certified marine pilots on the river and at the Marine Terminal
- All vessels calling on the terminal will be pre-screened and vetted through a tanker acceptance program
- All vessels will have a Shipboard Oil Pollution Emergency Plan, and required to carry pollution liability insurance

Operations:

- Fuel will be transferred from vessels to shore using hydraulically-operated articulated unloading arms
- The unloading arms will be designed with flexibility for tides and ship movement during offloading
- If the movement of the vessel exceeds the safe range, the fuel transfer process will be automatically stopped and the arms will be disconnected using leak-free emergency release couplings
- The terminal will be equipped with pre-deployed permanent booming complete with a pile deflection/ protection system and skimmers to collect any fuel spilled

Emergency Preparedness and Response:

- Spill response vessels will be deployed upon arrival of a vessel in the river, and will accompany the vessel to the terminal
- Before a vessel is offloaded, booms and skimmers will be positioned around the vessel to contain a spill in the unlikely event of an accidental release of product onto water, and to recover the product as quickly as possible
- The response boats would be on standby to deploy containment and absorbent booms in the water if required

The Marine Terminal site will be protected by perimeter fencing and landscape barriers along the dyke trail. The dyke trail will connect users in the Waterstone Pier area with existing and future trail systems further upstream.

Rendering of Fuel Receiving Facility – view looking north

Fuel Receiving Facility

The Fuel Receiving Facility will include six above-ground vertical carbon steel single wall tanks, each approximately 33.5 metres in diameter and 14.6 metres high, with an overall height of 21 metres above sea level. The tanks will provide a combined total capacity of approximately 80 million litres.

Operations:

- The Fuel Receiving Facility will operate quietly with little noticeable activity
- Fuel will be moved through contained systems from pipes to tanks with pumps that will be housed to reduce operating noise levels
- Tank systems will be equipped to reduce vapour emissions during fuel transfers and will be only locally noticeable
- Lighting and security of the facility will use state-of-the-art LED and motion detection to reduce the ambient level of light during night-time operation
- Noise, air quality and traffic will be mitigated through our comprehensive Operations Environmental Management Plan which will include a telephone information line

The tanks will have impermeably lined secondary containment areas

Emergency Preparedness and Response:

The Fuel Receiving Facility will be constructed to the National Building Code and the B.C. Building Code.

The facility will feature state-of-the-art fire detection and suppression systems including:

- Early detection systems inside tanks and in the piping/process area
- Automatic fire valves on tanks in the process area
- Foam suppression system inside each fuel storage tank
- Foam/water monitors and tank cooling system
- Fire hydrants at strategic and perimeter locations for access and operation by Richmond Fire Rescue
- Auxiliary and portable fire-fighting equipment

Environmental protection measures will include:

- Secondary containment and under-tank leak detection
- Redundant high level control to prevent tank overfill
- SCADA process monitoring system
- Emergency shut-down devices and emergency shut-down valves
- Process equipment located on concrete pads, with all drainage connected to an oil/water separator
- Drainage detection system to prevent a product release to ditches
- 24/7 monitoring by operations staff, with on-site spill response equipment, including portable spill response kits, spill response trailer and a vacuum truck

Pipeline

Modern pipeline systems have the benefit of precise locating technologies, new materials and coatings, and high-tech installation techniques to reduce disturbances during construction.

The pipeline will be about 14 kilometres long, 355.6 millimetres in diameter and buried for its entire length approximately 2.5 metres underground.

The pipeline will consist of specialty steel pipe and will be installed to meet a minimum Canadian Standards Association (CSA) Standard Z245.1 Grade 359 for Oil and Gas Pipeline Systems. The pipeline installation and operation will be regulated by the BC Oil and Gas Commission.

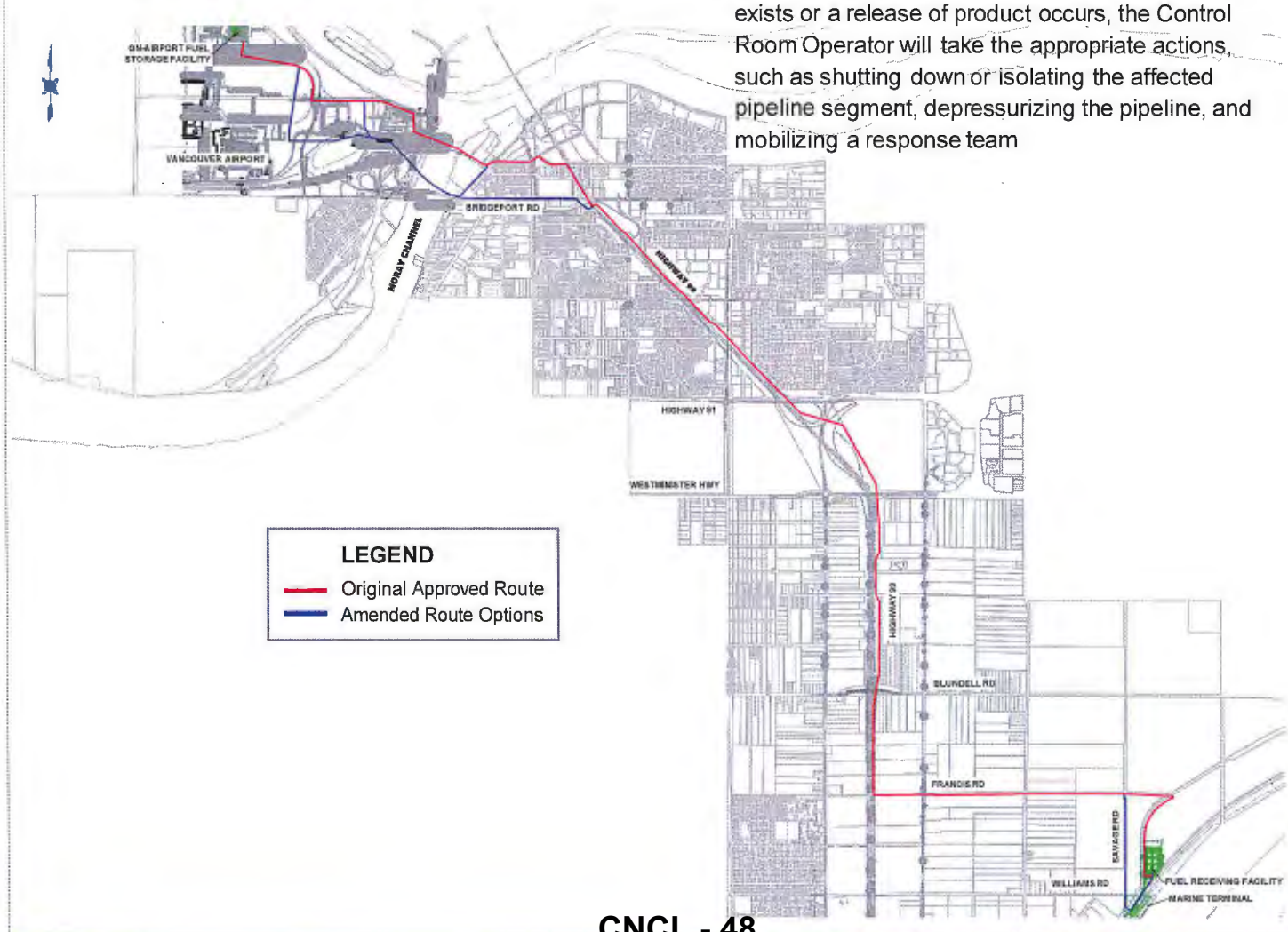
Prior to commissioning, the pipeline will be thoroughly tested and cleaned in accordance with construction and operational requirements, and clearly marked along its entire length. Similar to all other utility installation, location information will be provided to the City of Richmond and locator services.

Operations:

- The pipeline will be controlled and monitored by operations personnel during all fuel transfer activities
- It will be pressurized only during fuel transfer operations between the Fuel Receiving Facility and YVR (it will not operate 24/7)

Emergency Preparedness and Response:

- Prior to construction, an emergency response plan will be developed in conjunction with other municipal and regional emergency response plans
- The pipeline will include state-of-the-art corrosion protection and leak detection technologies
- The pipeline will be equipped automatic emergency shutdown devices, and pressure and flow monitors that will transmit data to a Control Centre
- Any abnormalities in pressure or flow will trigger an alarm or shutdown
- If the unlikely event that an abnormal condition exists or a release of product occurs, the Control Room Operator will take the appropriate actions, such as shutting down or isolating the affected pipeline segment, depressurizing the pipeline, and mobilizing a response team



CONSTRUCTION

Marine Terminal

The Marine Terminal construction is expected to start in late 2016, beginning with modifications to the existing dock. To meet the seismic performance requirements of the facility, significant rehabilitation of the shoreline will be undertaken to allow construction of off-shore mooring structures. Shoreline and underwater habitat will be restored as part of the development. Significant barge activity will occur during the fall and winter seasons, however no significant pile driving is anticipated until 2017.

Most noticeable activity in 2016 and early 2017 will be associated with the removal of unsuitable fill materials and components of the existing dock structure. These materials will be transported off-site. New structures will begin being installed in mid to late 2017.

Fuel Receiving Facility

The project recently received a Project Permit from the Vancouver Fraser Port Authority to commence construction of the Fuel Receiving Facility to be located on Port Authority owned land. This permit was awarded following a technical review and public consultation held in August/September 2015.

The Fuel Receiving Facility construction will begin in spring 2016 and consist of the following two key phases:

First phase

- The first phase will involve site preparation and ground improvement to provide the stability for the tanks to withstand a major seismic event
- This will involve heavy machinery movements and some localized ground vibrations. Some activity at the marine terminal is expected for delivery of bulk materials

Second phase

- In 2016, construction will start on the utilities, foundations and structural steel components of the fuel receiving facility
- Locally supplied materials such as concrete, rebar, mechanical and electrical components will arrive by road, while large-scale tank steel components, pipe, and other bulk materials are expected to arrive through the Marine Terminal
- Tank and foundation construction will take approximately one year and consist mostly of crane work and welding
- The final stage of construction will include perimeter road works, paving, fencing and landscaping, including screening vegetation

Pipeline

The pipeline will be constructed with resilient materials to current seismic design standards. Construction will include extensive use of directional drilling (particularly for water body crossings and intersections) to mitigate potential environmental impacts and avoid disruption of vehicle and marine vessel traffic.

Construction activities will include surveying and staking, preparing the right-of-way, digging the trench in which the pipeline will be placed, preparing the pipeline for installation (fitting it to the terrain) and applying a protective coat, installing the pipeline and associated valves and fittings, covering the pipeline and testing.

Pipeline construction is expected to begin in late 2016 or early 2017.

WHY THE PROJECT IS NEEDED

- The project is needed because the existing fuel delivery system it will replace is unsustainable. It relies on only two sources of fuel – the Chevron Refinery in Burnaby and the BP Cherry Point Refinery in Washington State. If one of these refineries shut down for an extended period, airport and airline operations would be jeopardized.
- Chevron supplies 40% of the airport's needs through the 40-km Kinder Morgan pipeline that originates near Burrard Inlet and crosses Burnaby and north Richmond.
- The pipeline was built at a time when four local refineries were operating. Chevron is the only one still in operation.
- Cherry Point supplies the remaining 60%, of which 40% is shipped via barges to the Westridge Marine Terminal, from where it is offloaded and shipped to the airport through the Kinder Morgan pipeline, and the remaining 20% is via tanker truck deliveries, which can total up to 40 a day.
- The Kinder Morgan pipeline, which is only 150 mm (6 in) diameter, is at capacity and since the late 1990s the tanker truck deliveries have been required to meet YVR's fuel demand.
- Any growth in fuel demand at YVR depends on more cross-border fuel truck shipments. For example, adding just one daily flight to Asia would require an additional 800 trucks a year.

PROJECT BENEFITS

- The project's spill prevention and response strategies for the Fraser River are robust and go well beyond industry standards and best practices, and is described by Environment Canada as the current state-of-the-art for spill modelling and potential incident preparation.
- The project will enhance the response capability on the Fraser River that will benefit all other users on the river.
- The project will have a smaller environmental footprint than the existing fuel delivery system, and will remove all the tanker trucks that carry fuel to YVR (over 1,200 each month) from Washington State through Surrey, Delta and Richmond.
- The project will help ensure that YVR remains a critical part of British Columbia's role as Canada's Pacific Gateway.
- The project will also help is needed to ensure YVR continues to have the fuel capacity to add the new flights.
- The project represents a $110 million investment and construction jobs in the Lower Mainland.

VANCOUVER AIRPORT FUEL FACILITIES CORPORATION

Vancouver Airport Fuel Facilities Corporation (VAFFC) is a not-for-profit company owned by a consortium of commercial airlines representing most of the domestic and international carriers serving Vancouver International Airport (YVR).

VAFFC owns and operates fuel storage and distribution facilities at YVR. These facilities are shared among the airlines, allowing them to avoid duplication and minimize costs. Similar fuel facility corporations operate at all of the major international airports across Canada and throughout the world.

The company has more than 20 years of experience in aviation fuel handling activities at YVR.

VAFFC contracts the management, construction and operation of its facilities to qualified organizations, and draws expertise from a network of experienced engineering and environmental consultants specializing in aviation fuel infrastructure.

FOR MORE INFORMATION

Email: info@vancouverairportfuel.ca
Phone: 604.638.7463
Website: vancouverairportfuel.ca

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Fuel Facilities Corporation
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Pipeline Construction

The pipeline will consist of specialty steel pipe manufactured in accordance with the American Society for Testing and Materials (ASTM) Standard A53 (Grade B) and will installed to the standards established by the Canadian Standards Association (CSA) Standard Z662-03 for Oil and Gas Pipeline Systems. The pipeline installation and operation will be regulated by the BC Oil and Gas Commission.

Pipeline construction will follow these phases:

Surveying and staking
Crews survey and mark the right-of-way and temporary workspace. Not only will the right-of-way contain the pipeline, it is also where all construction activities occur.

Preparing the right-of-way
The clearly marked right-of-way is cleared of trees and brush and the top soil is removed and stockpiled for future reclamation. The right-of-way is then leveled and graded to provide access for construction equipment.

Digging the trench
Once the right-of-way is prepared, a trench is dug and the centre line of the trench is surveyed and re-staked. The equipment used to dig the trench varies depending on the type of ground conditions. (Fig. 1)

(Fig. 1)

Stringing the pipe
Individual lengths of pipe are brought in from stockpile sites and laid out end-to-end along the right-of-way.

Bending and joining the pipe
Individual joints of pipe are bent to fit the terrain using a hydraulic bending machine. Welders join the pipes together using either manual or automated welding technologies. Welding shacks are placed over the joint to prevent the wind from affecting the weld. The welds are then inspected and certified by X-ray or ultrasonic methods.

Coating the pipeline
Coating both inside and outside the pipeline are necessary to prevent it from corroding either from ground water or the product carried in the pipeline. The pipes arrive at the construction site pre-coated, however the welded joints must be coated at the site.

Positioning the pipeline
The welded pipeline is lowered into the trench using equipment with special cranes called sidebooms. (Fig. 2)

Backfilling the trench
Once the pipeline is in place in the trench, the topsoil is replaced in the sequence in which it was removed and the land is re-contoured and re-seeded for restoration. Sections that are along roadways will be repaved.

Pressure Testing
The pipeline is pressure tested before it begins operations.

Final clean-up
The final step is to reclaim the pipeline right-of-way and remove any temporary facilities.

Construction information courtesy of the Canadian Energy Pipeline Association

(Fig. 2)

Directional Drilling

Construction will include extensive use of directional drilling (particularly for water body crossings and intersections) to mitigate potential environmental impacts and avoid disruption of vehicle and marine vessel traffic.

Directional drilling allows for extended sections of pipeline to be installed below congested or sensitive ground surfaces with very small surface disturbance. For example, the proposed section under the Moray Channel will be almost 800m long, almost 50 meters deep under the river bed, and enter and exit more than 100 meters from the water's edge.