

Social and Environmental Values in the Fraser River and Estuary in the Sandheads to Annacis Island Reach In Relationship to the Risks Caused by the Approved VAFFC* Proposal to Ship Jet Fuel into the Fraser River and Build an Off Loading Terminal and Tank Farm in Richmond Upstream of the Massey Tunnel

Otto E. Langer - Fisheries Biologist and Aquatic Ecologist

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On December 13, 2013 the B.C. Government in cooperation with Port Metro Vancouver (PMV) issued approval (an Environmental Certificate) to VAFFC to construct a marine jet fuel off loading dock and terminal and adjacent 80 million litre tank farm on the banks of the Fraser River. This project will allow barges and Panamax tankers of highly toxic and flammable jet fuel to enter the Fraser River for the first time in history.

This approval reverses past practices and decisions on the river by regulatory agencies and sets a terrible new precedent which will come back to haunt conservation in the river in the future. A similar but much smaller project of this type was proposed by VAFFC in 1988 but rejected by the Federal Government due to the threat this caused to the estuary and its abundance of fish and wildlife resources.

The barges and tankers of VAFFC will enter into the Fraser River via the Sandheads entry into the navigation channel and proceed about 8k m upstream to Garry Point at Steveston. In this reach the ships have to pass through the sharp turn of the Steveston Bend and then proceed some 13 km upstream of Garry Point to the terminal and tank farm site. The Steveston Bend is considered a dangerous navigation area by Transport Canada and VAFFC studies. In January 24, 2014 a large container ship ran aground in that area due to lost bearing during a relative common seasonal fog event.

The river channels keep changing in that millions of tonnes of sediment are transported into this area each year and extensive dredging is required to keep the channels navigable. The George Massey Tunnel is also a shipping bottleneck in that it is the rivers most shallow point and most large heavy ships cannot pass over it except at high tide and at times with reduced cargo loads as is required for VAFFC jet fuel tankers.

In that prevailing ocean winds and flood tides could drive a jet fuel spill upstream towards the Annacis Island area, the river area at risk from any accident related to this now approved jet fuel transportation project is some 21 km long. It must be appreciated that jet fuel is very toxic and is highly flammable under most circumstances.

*Vancouver Airport Fuel Facilities Corporation



Photograph of a large ship along the north side of the South Arm of the Fraser River. Here the ships must pass directly adjacent to a large recreational and housing complex – the same route jet fuel tankers would use. This location is about 400 meters downstream of the approved jet fuel terminal.

Any spill, fire or explosion would jeopardize many social and environmental values in this very important Canadian river and its and globally significant estuary.

That entire length of the river is of extremely high habitat value to hundreds of thousands of shore birds, waterfowl and other resident and migratory birds. With the adjacent estuarine areas it is the largest overwintering area for waterfowl in Canada.

The South Arm of the river and the estuary is of extreme importance to the survival of the world's largest salmon runs in a river system. Almost all adult salmon returning from the sea (over 20 million in some years) must pass the proposed jet fuel terminal and almost all juvenile salmon (up to 1 to 2 billion in a good year) must pass to the ocean in front of this dock and unloading terminal.

Many of these salmon such as the chum and Chinook salmon will reside in the waters around the proposed fuel terminal and tank farm area for up to two months each spring. They depend upon the food and rearing environment along the river shorelines and in the many sloughs in this reach of the river. Of course many habitats area have been lost due to filling and dykes during the past 140 years making what remains even more essential habitat. Over 80% of past critical marsh habitat has been lost. Despite this fact, many still feel there is room to compromise more of this last remnant habitat.

On the north bank of the South Arm downstream from Annacis Island, past the terminal site to Steveston the remaining habitats are truly remnant vestiges of what was once there. Here and there stands are the last remaining riparian forested areas and river side marshes. One such area can be found immediately downstream and adjacent to the proposed terminal. This site is classed as highly productive habitat. In the estuary plan such areas are color coded red. They are conservation areas of high productivity and often high sensitivity and industrial development is to avoid impacting them.



A valuable intertidal freshwater marsh / riparian habitat area immediately downstream of the approved jet fuel terminal. Any spill will most certainly and immediately contaminate this very sensitive and valuable fish and wildlife habitat area. Dock is to be located at the black object below the arrow point.

Further downstream on the north side of the river is the historic 'squatter' community in the valuable Finn Slough habitat area. Downstream of that is the London and Steveston Island marshes. At Steveston, the Hole in the Wall allows water from the South Arm to spread across Sturgeons bank - one of the largest estuarine marshes in this region. The Steveston training wall directs the river in a northwest direction across the sand and mud flats and then abruptly turns south west. This area is called the Steveston Bend and it poses some risk to large ship navigation.

The south bank of the South Arm is more richly endowed with relatively undeveloped sections of highly productive marsh lands. Directly across the river from the terminal and on the south side of the South Arm is the Tibury Slough complex, Deas Regional

Park and Deas Slough. Immediately downstream of that is the is one of the most complex and extensive estuarine marsh areas in BC as the river widens into the Ladner Marsh and Richmond Islands (Duck, Barber and Woodward Islands complex).

The Tilbury Slough to Richmond Island area is a maze of islands, marshes and excellent juvenile salmon rearing areas and is intensively used by over a hundred species of birds and other wildlife. It is one of the few areas where bird hunting is still allowed. Here the river then forms distributary Canoe Pass channel and it and the South Arm overflow water spreads across the mudflats and marshes of Westham Island and Roberts Bank. The above complex of quiet rearing waters, marshes and sand and mudflats makes this area one of the best fisheries rearing and wildlife areas in the Americas.

Unfortunately the Roberts Bank ecological and geo-hydrological integrity was severely compromised in the 1960s by the BC Ferries and the Roberts Bank Port causeways, car and shipping container parking lots, docks and coal port facilities. New proposals to greatly increase the size of the port by Port Metro Vancouver will have an immense additional impact on the habitat and natural life in this area. In that backup terrestrial green spaces and farmlands are an integral part of the estuarine ecosystem, the present extensive development of the farmlands backing onto Roberts Bank will especially compound those impacts on wildlife.

The Western Hemisphere Shorebird Reserve Network rates these overall Roberts and Sturgeons Banks and Boundary Bay estuarine areas as a Hemisphere Site for shorebird abundance. Only eight of these sites exist in all of North and South America. The sand and mudflats are key food production areas for shorebirds due to the microscopic growth of life on them known as the biofilm phenomenon. The lower flats support key eel grass beds and that is a key zone for shrimp and crab production and is an essential spawning area for herring and many other species of fish.

Along the shoreline are the few remaining large trees in the estuary. These trees are very important for songbirds of many species. They serve as nesting sites and are key rest and observation and nesting areas for bald eagles and other raptors. The forested site immediately adjacent to the jet fuel terminal is indeed one of these are valuable shoreline forested areas.

The above abundance of fish and wildlife of course makes this area extremely valuable for recreation of all sorts. There is everything from motor sports to kayaking, whale watching and sea lion observation excursions. Seals and California sea lions will indeed swim up the river and can be found in the Steveston area. Seals commonly frequent the area of the jet fuel terminal.



The large remaining sand / mud flats in Boundary Bay, Roberts and Sturgeons Bank areas and George C. Reifel Migratory Bird Sanctuary are largely protected from development other than the intrusive port facility on Roberts Bank. These areas are the backbone of the Fraser Estuary for many fish species and many forms of waterfowl and shorebirds of international

Recreational fishing occurs during all seasons at all opportune locations in the river and along its shorelines from Garry Point to Annacis Island. Boaters of course go well downstream of that area and into the ocean. Commercial and First Nations fisheries do occur in the section of the river directly in front of the jet fuel terminal. During a salmon opening, 200 fishing boats could be in this reach of the river. Whale watching does take place mainly in the estuary beyond the river mouth but even grey whales have been spotted in the river and endangered killer whales just off of Steveston. Harbour seals and migratory sea lions are very common in the area and can be seen in Cannery Channel (Steveston Harbour) immediately adjacent to the public docks. This overall habitat area from the jet fuel terminal to the ocean is home to about 80 species of fish.

Near the low tide mark in more brackish waters can be found eel grass beds. These beds are of extreme value to the Fraser River estuary. In the spring they serve as ideal spawning grounds for herring. Here the herring eggs adhere to the eel grass beds.



Bird watching is very important in the Fraser River Delta in that the river, estuarine, green space and farmland habitats supports hawks, eagles, snow geese, sand hill cranes, swans, black brandt, shorebirds like plovers and sand pipers, many species of ducks, grebes, loons, cormorants etc. Some of these areas have developed into important bird watching areas and the development of Steveston, the Lulu Island dyke trail system and the Ladner area marshes and Westham Island bird sanctuaries has brought in thousands of tourists each month to enjoy the bird life and riverside walks. In Steveston the dockside restaurants and the wildlife that comes right up to the docks is a major attraction in Richmond. This is indeed an area of needed maximum protection for social, recreational, business and existence values for now and future generations.

Park and conservation area are very prevalent in this reach of the river. The overall reach covered is from Sandheads to Garry Point (8km), Garry Point to VAFFC Terminal (13km) and from the Terminal to the bottom end of Annacis island - 5 more kms for a total reach length of 26 km. The reach upstream of the Terminal is important to include in that the river does reverse at flood tides and the westerly ocean winds drive flows upstream and the ocean salt wedge reaches that point in the South arm. Key park and conservation areas in this river reach include:

North side of the river:

- Annacis and Don and Lion Islands
- Triangle Road Park (immediately beside the jet fuel terminal area)
- Finn Slough

- Britannia Shipyard Park
- Shady Island and Cannery Channel
- Garry Point Park and Sturgeons Bank (Ramsar designated)
- Iona and Wreck Beaches



Marine mammals are a common sight in this part of the river and estuary. Beaver, muskrat, river otter, harbour seals and California sea lions are evident. This sea lion is at the fish market dock in Steveston.

South shoreline of this reach:

- Deas Island Regional Park
- Ladner Marshes and Ladner lagoon restoration area
- Duck Barber Woodward Island complex (the Richmond Islands - Ramsar designated).
- Alaskan National Wildlife Refuge
- G. C. Riefel Migratory Bird Sanctuary
- Roberts Bank and Ramsar designated wetlands

These areas are also Wildlife Management Areas (BC designation) and recognized as a IBA (Important Bird Area by Birdlife International). They are also rated as one of eight Hemispheric Sites in the Americas by the Western Hemisphere Shorebird Reserve Network.



The Garry Point to No 3 Road shoreline trail and boardwalk in the Steveston area covers some 4 km of river frontage. It includes well used summer beach areas, restaurants, a fisherman's dockside market and is a major tourist draw in Richmond. The shrimp in the picture were caught in the Fraser estuary.



**Garry Point Beach
(in the winter)**

This reach of the river is also home to several marinas including the Ladner and Steveston Harbour Authorities, Shelter Island Marina and closer to the jet fuel terminal is the large BC ferries holding lagoon and repair facilities. Recreational boating is a daily activity and peaks on weekends especially in the summer fishing seasons. The large marina complex in Steveston's Cannery Channel indeed is home to one of the largest fishing / recreational fleets in BC. Richmond has made many dock improvements to host tall ship events in Cannery Channel.



Steveston Harbour is very active with its many on shore activities and commercial and recreational fishing fleet and docks that host tall ships and a recreational fishery.

The entire area described above is subject to the impacts of shipping and above will be highly sensitive to any size of jet fuel spilled into the river. Jet fuel is very toxic and flammable and will rapidly spread over the river and onto the sensitive marshes and mudflats. It will cover the gills of fish, the feathers of birds and the fur of marine mammals. It will also soak into the many habitat areas and once in the sand and shoreline detrital (broken down plant material) collection areas it will remain there for weeks or months.

The contamination of the marshes, mudflats and organic detritus will harm the very basis of the food chain in the estuary. Estuaries such as that of the Fraser River are some of the most productive ecosystems in the world. A significant part of that production becomes human food. Persistent jet fuel contamination of any of these habitat areas will make them unable to support healthy marsh plant growth and invertebrate growth - the basis of the food chain in this globally significant estuary.

Jet fuel is also well known to taint the flesh of fish and any spill into a fish migratory and holding area can contaminate the fish and fishing gear. A shut down of the fishery to avoid fish tainting and health concerns would cause the loss of millions of dollars of commercial, aboriginal and recreational fishery losses. Relatively small spills of such noxious materials into the Fraser during past fishery openings did cause the shutdown of important fisheries with significant losses to that industry.

Should a jet fuel dock facility, tank farm and tankers and barges of jet fuel be allowed into the Fraser river, future generation will wonder who and how was this decision made especially in what should have been an era of knowledge and precautionary decision making.



A cormorant fishing In the Steveston Harbour public dock area..

Otto E. Langer October 15, 2014

Photos by Otto Langer