

COMMENT ON FATE AND EFFECTS OF A DIESEL OIL SPILL ON MARINE LIFE AND HUMANS IN SEVERAL AREAS OF THE QUEEN CHARLOTTE BASIN –Dr. Chris Kennedy 2016

The potential of a spill of diesel oil to the relatively pristine ecoregion of the Queen Charlotte Basin is of concern from both an environmental and human health perspective

Light diesel fuel oil is a complex mixture of hydrocarbons and contains chemicals of potential concern (COPCs) that have been well studied in many aquatic species and in humans. The major chemicals identified as COPCs in diesel fuel oil include the mono-aromatic hydrocarbons (MAHs) and polycyclic aromatic hydrocarbons (PAHs).

Diesel oil contains chemicals which dissolve in water and will result in rapid acute toxicity

The MAHs (e.g. benzene, toluene, ethylbenzene and xylenes [BTEX]) and low molecular weight PAH (e.g. naphthalene) are the most water-soluble and bioavailable chemicals in diesel to aquatic organisms and will result in rapid acute toxicity. *In terms of toxicity to water-column organisms, diesel is considered to be one of the most acutely toxic oil types.*

High molecular weight PAH may persist for longer time periods

High molecular weight PAH may persist for longer time periods, and could be the source of limited chronic toxicity with chemical-specific effects that may include changes in biochemistry, behaviour, immune systems, and growth, as well as incur genotoxic, reproductive, and developmental effects, and neurotoxicity in many organisms.

Chemical dispersants may exacerbate effects

The use of chemical dispersants to break up oil spills in the marine environment may also exacerbate effects on marine biota.

The potential impact areas for this comment are in the Prince Rupert Port Authority at Ridley Island in the inner Skeena Estuary, Chatham Sound (outer Skeena estuary), and Dixon Entrance.

The major differences between these sites are the openness of the water bodies, the currents, tides, weather conditions and exposure, the species inhabiting these ecological zones, and the potential for interaction with the terrestrial (intertidal) environment. Small spills in open water will evaporate rapidly or become so diluted that effects on larger organisms such as fish are unlikely. However, a large diesel spill has the potential to have a very large impact that will be most severe in the more enclosed areas; Ridley Island > Chatham Sound > Dixon Entrance.

- **Salmon nurseries and migration corridors will be oiled**- Due to the confined nature of Ridley Island and Chatham Sound, it is likely that intertidal areas and juvenile fish habitats (e.g. salmonid nurseries and migration corridors) will be oiled and undergo significant alterations.
- **Potential human health impacts**- In humans, there is a potential for the inhalation of volatile organic compounds evaporating from the spill or ingestion, which could result in minor or serious health impacts. Health effects of diesel exposure in humans includes dizziness, headache, nausea, palpitation, pressure in the chest, and eye irritation as well as more serious effects including neurological disease, cancer, and teratogenic effects.

A spill of the magnitude suggested in this area will undoubtedly have extremely large biological impacts on the region, impacts which will affect the entire ecosystem and its components, possibly for decades; recovery to pre-oil spill conditions may never occur.