

Attachment H – Summary of oil properties and adverse effects

Summary of oil type physical/chemical properties adverse effects on environment.

Oil Type	Fate / Behavior	Adverse Effects on Environment
<p>Light to volatile oils (includes Bakken crude)</p>	<ul style="list-style-type: none"> • Spread rapidly • Tend to form unstable emulsions • High evaporation and solubility • May penetrate substrate • Removed from surfaces by agitation and low-pressure flushing 	<ul style="list-style-type: none"> • Toxicity is related to the type and concentration of aromatic fractions: 1) naphthalene, 2) benzene • Toxicity of aromatic fractions depends on their biological half- lives in different species • Toxic to biota when fresh • Marsh plants may be chronically affected due to penetration and persistence of aromatic compounds in sediments
<p>Moderate to heavy oils (with notes re dilbits)</p>	<ul style="list-style-type: none"> • Moderate to high viscosity • Tend to form stable emulsions under high energy marine environments (dependent on type of dilbit) • Penetration depends on substrate particle size (CL appears to have less penetration than comparable viscosity crude) • Weathered residue may sink and be absorbed by sediment (may become neutrally buoyant to sink, depending on degree of weathering, type of dilbit, and receiving water) • Immiscibility assists in separation from water • Weather to tar balls 	<ul style="list-style-type: none"> • Adverse effects in marine organisms result from chemical toxicity and smothering • Toxicity depends on size of light fraction (dilbit formulation dependent but typically very light end diluents are rapidly lost through evaporation) • Low toxicity residue tends to smother plants or animals • Light fractions contaminate interstitial waters
<p>Asphalt, #6 fuel-oil, Bunker C, waste oil</p>	<ul style="list-style-type: none"> • Form tar balls at ambient temperatures • Resist spreading and may sink • May soften and flow when exposed to sunlight • Very difficult to recover from the water • Easy to remove manually from beach surface with conventional equipment 	<ul style="list-style-type: none"> • Immediate and delayed adverse effects due to small aromatic fractions and smothering • Most toxic effects due to incorporation in sediment • Absorption of radiated heat places thermal stress on the environment • Lower toxicity on marine plants than mobile animals

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