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CLEANUP PROCEDURES



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OIL SPILL EATER II PROCEDURE FOR OIL SPILL CLEANUP

GENERAL INFORMATION

It takes approximately 2 to 24 hours for OIL SPILL EATER II to penetrate the molecular wall of fresh crude oil. It takes OIL SPILL EATER II approximately 3 to 15 minutes to penetrate the molecular wall of light end petroleum or gasoline.

However, once you spray OIL SPILL EATER II on the oil, it attaches itself and will eventually engulf the oil regardless of where the oil or light petroleum may spread on ocean waters or on rivers and streams.

Additionally, once sprayed with OIL SPILL EATER II, the oil cannot attach itself to the shoreline, to rocks or to any equipment in its path.

If OIL SPILL EATER II is to be used on ocean spills or on Intertidal Zones, mix product with ocean water.

If OIL SPILL EATER II is to be used on lakes, rivers, streams, ponds or on land, mix with water from a lake, river, stream or pond.

If you are performing a cleanup, **MAKE SURE** that the water used to mix with OSEII and the water used to keep area saturated is the type of water normally associated with that area. If you use fresh water in an area normally contacted with salt water or vice versa, these are different types of bacteria and competition could occur. Competition will slow the bioremediation until the area re-stabilizes.

NOTE: *Never mix tap (faucet) water and OIL SPILL EATER II (IF POSSIBLE).
The chlorine in the tap (faucet) water slows bacterial enhancement.*

These *Procedures and Application Instructions* cover Heavy End and Light End Hydrocarbons. The OSEI Corporation defines Light End Hydrocarbons as: BETX, gasoline and light solvents. Heavy End Hydrocarbons are crude oil, halogenated hydrocarbons, heavy



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OIL SPILL EATER II (OSE II)

PROCEDURE FOR CLEANUP OF HEAVY END HYDROCARBONS - ON WATER

1. To determine quantity of *Oil Spill Eater II* concentrate needed:

A. On a Spill:

1. Use one (1) gallon of OSE II concentrate for every fifty (50) gallons of oil.
2. Use one (1) barrel of OSE II concentrate for every 2,750 gallons of oil.

B. If you know how many gallons of oil:

Multiply Gallons of oil (A) x .02 = OSE II concentrate needed

-Or-

If you know how many barrels of oil:

Multiply Barrels of oil (A) x .015 = Barrels of OSE II concentrate needed

C. If you do not know how many gallons or barrels of oil:

Multiply: $\frac{A () \text{ Yds}}{\text{Length of Oil Slick}} \times \frac{B () \text{ Yds}}{\text{Width of Oil Slick}} \times \frac{C () \text{ Inches}}{\text{Thickness of Oil}}$

x (.0023) = Barrels of OSE II Concentrate Needed

-Or-

x (.12) = Gallons of OSE II Concentrate Needed

II. Application Procedure:

A. Water temperature above 40° F

1. Dilute each gallon of OSE II concentrate with fifty gallons of fresh or sea water - depending on the area that is contaminated.

2. Using a helicopter or a barge with spray booms, eductor system or hand sprayer, spray the mixed OSE II onto the perimeter of the oil spill and work toward the center.
 3. Next - spray OSE II over the entire surface of the spill. If the oil spill is very heavy (more than two or three inches deep), you may have to reapply OSE II to gain the one (1) part mixed OSE II to one (1) part heavy end hydrocarbon.
- B. Water temperature lower than 40° F
1. Cold water reduces the rate at which OSE II enhances biodegradation of crude oil. However, biodegradation will continue to 28° F in salt water and 32.5° F in fresh water.

III. If Testing is Required:

- A. Items needed:
1. An extraction device that will hold 100 ml or 3 ounces of liquid and can be pushed 6 inches or 60 cm below the water's surface.
 2. 20 brown 100 ml bottles with teflon sealed caps.
 3. Ice chest and ice to transport samples to the lab.
- B. Pre OSE II Application Procedures:
1. Keep a daily log of observations.
 2. Decide on 3 areas of the spill forming a triangle (Δ) to extract 3 samples.
 3. Extract the 3 samples with the extraction device, pushing the collection vessel just under the surface.
 4. Place each extraction in a brown jar and seal with teflon cap.
 5. Mark jars (*Initial Untreated Samples*).
 6. Place samples in the ice chest.
- C. Perform the same steps above except pull 1 sample proximal to the spill but from an area not contaminated, affected, or impacted in any way by the spill. This is to determine what the background level or pre spill conditions are. Note the time and date of extraction.

- D. 10 minutes after applying OSE II, perform the next extractions.
1. If possible, using the same triangle extraction points, push extraction device approximately 2 to 3 inches below the surface and pull extraction.
 2. Decant extracted sample into a brown jar and mark initial sample 3 minutes after applying OSE II, and note the time and date of extraction.
 3. Place brown jar samples in the ice chest and transport to the lab.
- E. Sampling Times
1. Using procedures in D above, extract samples on day 7, day 15, day 30 and every 15 days thereafter until the acceptable level of cleanup is accomplished. Obviously, testing should cease once the acceptable levels are met.
 2. In most cases, within 30 days the acceptable levels will have been accomplished.
- F. Lab Tests
1. If the spill is light end hydrocarbons, then either EPA method 8015 or 8030 should be performed.
 2. If the spill is heavy end hydrocarbons, then either EPA method 8030 or 8100 should be utilized.

IV. If Toxicity Testing is required:

- A. Items Needed
1. An extraction device that will be capable of extracting 100 ml samples 3 meters or 3 feet below the waters' surface.
 2. 12 - 100 ml brown jars with teflon seals.
 3. Ice chest with ice.
- B. Using instructions for extractions and the extraction time / date in III above to perform sampling
1. The 3 samples, once at the lab, should be homogenized and used for a toxicity test.

Note: In the ocean mysids, or mummichogs are generally acceptable species, and in fresh water minnows or rainbow trout are generally acceptable species.

In most cases, one toxicity test just after application of OSE II is required. However, if toxicity sampling is carried out each time efficacy testing is performed, then toxicity reduction will be proven as well.

Note: If spill is on the ocean, use ocean water to mix "OSE II." If spill is on a lake, river, stream or pond, use lake, river, stream or pond water to mix with "OSE II." To mix ocean water with anything other than ocean water and vice versa may cause adverse competition.

N E V E R mix "Oil Spill Eater II" with tap water - if possible!



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OIL SPILL EATER II

PROCEDURE FOR CLEANUP OF LIGHT END HYDROCARBONS - ON WATER

1. To determine quantity of *Oil Spill Eater II* concentrate needed:

A. On a Spill:

1. One (1) gallon of OSE II concentrate for every one hundred (100) gallons of light end hydrocarbons.
2. One (1) barrel of OSE II concentrate for every 5,500 gallons of light end hydrocarbons.

B. If you know how many gallons of light end hydrocarbons spilled:

Multiply Gallons of spill (A) x .01 = Gallons of OSE II concentrate needed
 -Or-

If you know how many barrels of light end hydrocarbons spilled:

Multiply Barrels of spill (A) x .0075 = Barrels of OSE II concentrate needed

C. If you do not know how many gallons or barrels of light end hydrocarbons:

Multiply: $\frac{A () \text{ Yds}}{\text{Length of Spill}} \times \frac{B () \text{ Yds}}{\text{Width of Spill}} \times \frac{C () \text{ Inches}}{\text{Depth of Spill}} \times$

(.0012) = Barrels of OSE II concentrate needed

(.06) = Gallons of OSE II concentrate needed

II. Application Procedure:

A. Water temperature above 40° F

1. Dilute each gallon of OSE II concentrate with one hundred gallons of fresh or sea water. Do not use fresh water on ocean water or vice versa or adverse competition may occur.

2. Using a helicopter or a barge with spray booms, eductor system set at 1%, or any spray system, spray a heavy coat of Oil Spill Eater II on the outside edges of the spill and work toward the center, if possible. This will help keep the spill from spreading.

As the spray reaches and saturates the light end hydrocarbon molecules, emulsion will start immediately and the fire hazard will be eliminated as quickly as complete emulsion takes place. The light end hydrocarbons will eventually be converted to CO₂ and water.

3. The fire hazard should be eliminated in 4 hours or less, and the hydrocarbons should be eliminated expeditiously also.

B. Water temperature below 40° F

1. Cold water reduces the rate at which OSE II enhances biodegradation of hydrocarbons. However, biodegradation will continue on salt water down to 28° F, and on fresh water down to 32.5° F.

III. If Testing is Required:

A. Items needed:

1. An extraction device that will hold 100 ml or 3 ounces of liquid and can be pushed 6 inches or 60 cm below the water's surface.
2. 20 brown 100 ml bottles with teflon sealed caps.
3. Ice chest and ice to transport samples to the lab.

B. Pre OSE II Application Procedures:

1. Keep a daily log of observations.
2. Decide on 3 areas of the spill forming a triangle (△) to extract 3 samples.
3. Extract the 3 samples with the extraction device, pushing the collection vessel just under the surface.
4. Place each extraction in a brown jar and seal with teflon cap.
5. Mark jars (*Initial Untreated Samples*).
6. Place samples in the ice chest.

- C. Perform the same steps above except pull 1 sample proximal to the spill but from an area not contaminated, affected, or impacted in any way by the spill. This is to determine what the background level or pre spill conditions are. Note the time and date of extraction.
- D. 10 minutes after applying OSE II, perform the next extractions.
1. If possible, using the same triangle extraction points, push extraction device approximately 2 to 3 inches below the surface and pull extraction.
 2. Decant extracted sample into a brown jar and mark initial sample 3 minutes after applying OSE II, and note the time and date of extraction.
 3. Place brown jar samples in the ice chest and transport to the lab.
- E. Sampling Times
1. Using procedures in D above, extract samples on day 7, day 15, day 30 and every 15 days thereafter until the acceptable level of cleanup is accomplished. Obviously, testing should cease once the acceptable levels are met.
 2. In most cases, within 30 days the acceptable levels will have been accomplished.
- F. Lab Tests
1. If the spill is light end hydrocarbons, then either EPA method 8015 or 8030 should be performed.
 2. If the spill is heavy end hydrocarbons, then either EPA method 8030 or 8100 should be utilized.

Note: If spill is on the ocean, mix "OSE II" with ocean water. If spill is on a lake, river, stream or pond, mix "OSE II" with lake, river, stream or pond water.

N E V E R mix "Oil Spill Eater II" with tap water!



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PROCEDURE FOR REMOVAL OF A HYDROCARBON SHEEN ON WATER, CONCRETE, AND ASPHALT

1. To determine quantity of *Oil Spill Eater II* concentrate needed:

$$\begin{array}{l} \text{Multiply: } \frac{A \text{ () Ft.}}{\text{Length of}} \quad \times \quad \frac{B \text{ () Ft.}}{\text{Width of}} \quad \times \quad .0004 \\ \text{Spill} \qquad \qquad \qquad \text{Spill} \\ \\ \text{= Gallons of OSE II concentrate needed} \end{array}$$

II. Application Procedure:

1. Dilute each gallon of OSE II concentrate with 50 gallons of fresh or sea water. Do not use ocean water with fresh water or vice versa because adverse competition may occur.
2. Using a barge with spray booms, hand sprayer or eductor system set at 2%, (depending on size of sheen), spray a good coating of OSE II over the entire sheen. As soon as the OSE II reaches the sheen, emulsion and solubilization will start immediately and finally conversion to CO₂ and water.
3. The hydrocarbons should be emulsified and solubilized rapidly and any fire hazards will be eliminated rapidly. Conversion to CO₂ and water is expeditious.

NOTE: If sheen is on ocean water, mix "OSE II" with ocean water. If sheen is on a lake, river, stream or pond, mix "OSE II" with lake, river, stream or pond water.

NEVER mix OSE II with tap water if possible!



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OIL SPILL EATER II

PROCEDURE FOR CLEANUP OF HYDROCARBONS - ON INTERTIDAL ZONES

1. To determine quantity of *Oil Spill Eater II* concentrate needed:

$$\begin{array}{l} \text{Multiply: } \frac{\text{A () Yds}}{\text{Length of}} \quad \times \quad \frac{\text{B () Yds}}{\text{Width of}} \quad \times \quad \frac{\text{C () Inches}}{\text{Thickness of}} \quad \times .12 \\ \text{Oil Slick} \qquad \qquad \text{Oil Slick} \qquad \qquad \text{Oil} \\ \\ = \underline{\text{Gallons of OSE II concentrate needed}} \end{array}$$

II. Application:

- A. Dilute each gallon of OSE II needed (from I above) with 50 gallons of ocean water or fresh water, or mix 50 gallons of fresh or sea water, depending on area to be cleaned, with 1 gallon of OSE II. Do not use ocean water with fresh water or vice versa because adverse competition may occur.
- B. It is important that you apply enough OSE II mixed 50 to 1 to get 1 part mixed OSE II to 1 part spilled hydrocarbon to ensure mobilization of oil will occur.
- C. In an Intertidal Zone, it may be difficult to obtain the exact application rate, so additional applications may be necessary.
- D. If necessary, Oil Spill Eater II should be applied every 48 hours in water above 40° F and every 72 hours in water below 40° F. Application should continue until oil is completely mobilized from beach area.
- E. If subsurface oil occurs, OSE II will percolate along with the oil and once natural bacteria growth is started, the bacteria with its affinity for hydrocarbons, will follow the food source.

NOTE: If Intertidal Zone is in an ocean setting, mix "OSE II" concentrate with ocean water. If Intertidal Zone is a fresh water setting such as a lake, river, stream or pond, mix "OSE II" with lake, river, stream or pond water.

NEVER mix OSE II with tap water if possible!