Case Study: In-Situ Treatment of Oil Contamination in Tidal Disposal Pits – Nueces Bay, Texas

Background:

In compliance with state environmental mandates, two tidal disposal pits in San Patricio County, Texas, were closed after being used for over 25 years to collect oil from the discharge of produced salt water into Nueces Bay. To prevent potential hydrocarbon contamination of the bay, the oil production company contracted a local remediation firm to conduct the pit closure.

Initial perimeter sampling of the pits revealed **Total Petroleum Hydrocarbon (TPH) levels ranging from 71,000 to 140,000 ppm**, indicating a significant level of contamination. Given the reported **80 cubic yards** of contaminated sludge, **Padre Environmental recommended using three drums of X4JH2000** to lower TPH levels in accordance with **Railroad Commission** requirements (below **10,000 ppm**). However, due to site limitations, the contractor could not sample the middle of the pits before remediation.

Remediation Process:

1. **Initial Application of X4JH2000:**
    - The contractor mixed **three drums of X4JH2000** concentrate with **3,000 gallons of fresh water** and applied the solution to the contaminated sludge.
    - A backhoe was used to thoroughly mix the sludge and treatment solution.
    - It was soon discovered that **beneath a thin film of rainwater, the pits contained a much greater volume of heavy, weathered crude (estimated at 3–4 barrels per pit)**—significantly more oil than initially anticipated.
    - The application exhausted the initial supply of X4JH2000, resulting in **a noticeable reduction in hydrocarbon odors and a visible color change** in the sludge, but further treatment was required.
2. **Additional Treatment & Final Application:**
    - Recognizing the additional crude volume, **two more drums of X4JH2000 were dispatched** to the site.
    - These were mixed with **1,000 gallons of fresh water** and applied to the remaining contaminated sludge while being **agitated with the backhoe**.
3. **Final Sampling & Results:**
    - The following workday, **post-treatment sampling was conducted using the backhoe to extract representative sludge samples**.
    - Laboratory analysis confirmed a **91% reduction in TPH levels**, with contamination dropping from **140,000 ppm to 11,510 ppm**.
    - To further meet regulatory targets (below **10,000 ppm**), fresh soil from a nearby location was mixed with the treated sludge to aid dilution and stabilization.

Conclusion:

- **Effective TPH Reduction:** The application of X4JH2000 successfully **reduced TPH levels by 91% in a single treatment**, bringing contamination down from 140,000 ppm to 11,510 ppm.
- **Cost Efficiency:** The production company expressed **enthusiasm for both the chemical's performance and the overall job cost**, which proved significantly more economical than their initial estimate for **traditional excavation and disposal**.
- **Regulatory Compliance:** The final treatment approach, including the use of fresh soil for dilution, ensured that TPH levels met **Railroad Commission standards** for site closure.

This case study demonstrates the **effectiveness and cost-saving benefits** of X4JH2000 in treating **heavy crude contamination in tidal disposal pits**, offering a rapid, in-situ solution that eliminates the need for expensive excavation and off-site disposal.