

PROPOSAL FOR TAR BALLS REMEDIATION



Submitted By:

Safar Mohammad Khan

Area Manager-West India



GREENAPPLE
Green Approach to combat
hydrocarbon pollution

OIL SPILLS- SERIOUS ENVIRONMENTAL DISASTER

Oil spills are a major menace to the environment as they severely damage the surrounding ecosystems. Since crude oil is lighter than water, it floats on the sea surface and results in a swift-spreading fire. Oil spills can also take place on the land as a result of leakage from terrestrial pipelines and pilferage activities.

Apart from the accidental spills of crude oil, oily sludge – hydrocarbon waste generated in huge quantities by oil refineries – also creates environment pollution. Oil refineries need a well-planned oily sludge management strategy to manage oil sludge. A straightforward approach may be to dump the oily sludge into specially constructed pits. Since the possibility of seepage cannot be ruled out, the ideal sludge pit should incorporate a leachate collection system and a polymer lining to prevent the percolation of contaminants into the groundwater. Such pits are not only very expensive, but are also needed in large numbers for a single refinery. Since there is a limit to the area available within a refinery, alternative solutions for the eradication of oily sludge have to be sought.



MENACE DUE TO OIL SPILLS ON LAND:

- Fire Hazards
- Groundwater pollution due to percolation of hydrocarbons
- Air pollution due to evaporation
- Visual pollution

GREEN APPLE ENVIRONMENTAL TECHNOLOGIES AS EMERGENCY RESPONSE TEAM

Effective and efficient spill response starts with preparation, long before any incident. The Vision of Green Apple Environmental Technologies (GAET) is to provide a complete, professional and timely service to our clients covering all aspects of oil spill pollution response and safety services in a practical, efficient and cost-effective manner.

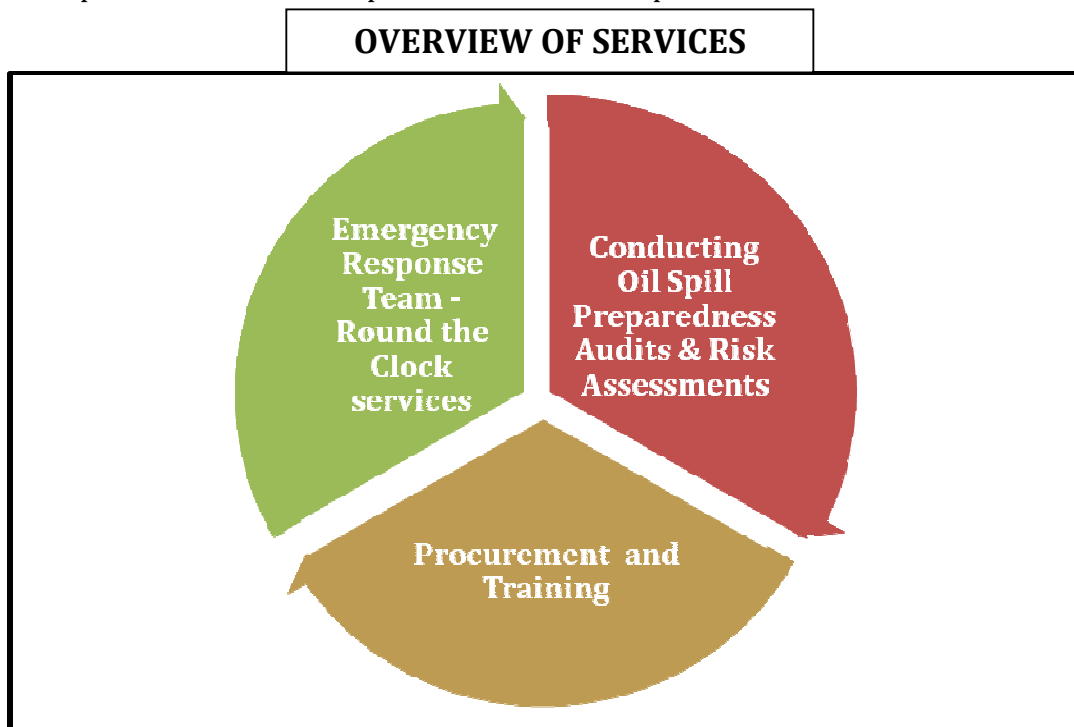
The key to effective response lies in the expertise of people to solve problems and understanding the issues surrounding oil spills and the preparation of equipment. We pride ourselves on the quality of our people and the reliability of our product to meet response needs.

KEY ELEMENTS OF EMERGENCY OIL SPILL RESPONSE

Green Apple Environmental Technologies provides services for oil spill incidents at both onshore and offshore locations. Our unique set of skills and capabilities allows us to offer you turnkey solutions to your environmental problems.

Our services would include :

- To conduct Oil Spill Preparedness Audits and Oil Spill Risk Assessments to evaluate your equipment, your response capability, and your maintenance regime. In addition to identifying your particular requirements, we will also provide our product RAMSORB for oil spill containment.
- Provision of Relief Teams for Accidental Oils Spills and Training Programme.
- Responds to Marine Oils Spills and Land Based Spills.



GOA BEACH POLLUTION-2010

INTRODUCTION

An unexplained oil spill off the Goa coast has resulted in black balls of hardened oil washing ashore on most beaches in south Goa and some parts of north Goa.

Slimy "tar balls" have been washed ashore on the famous beaches of Colva, Betalbhatim, and Sernabatim in south Goa and Calangute, Siquerim, and Candolim beaches in North Goa.



Scenario of Colva beach in recent tar ball deposition in Goa

According to the tourism department, it is a normal phenomenon which occurs in Goa during the monsoons. One common cause for such a slick is dumping oil overboard by a passing ship. After a spill, initially, the lighter components of the oil evaporate much like a small gasoline spill. In the cases of heavier types of oil, such as crude oil, much of the oil remains behind.

State authorities already had started an extensive operation to clean the beaches, known for attracting nearly 2 million tourists to the state. They have collected the contaminated soil using brooms and it has been transferred to the remote areas for disposal.

At the same time, some crude oils mix with water to form an emulsion that often looks like chocolate pudding. This emulsion is much thicker and stickier than the original oil. Winds and waves continue to stretch and tear the oil patches into smaller pieces, or tarballs. While some tarballs may be as large as 30 cm in diameter, most are coin-sized or a bit bigger.



Tar mixed with sand

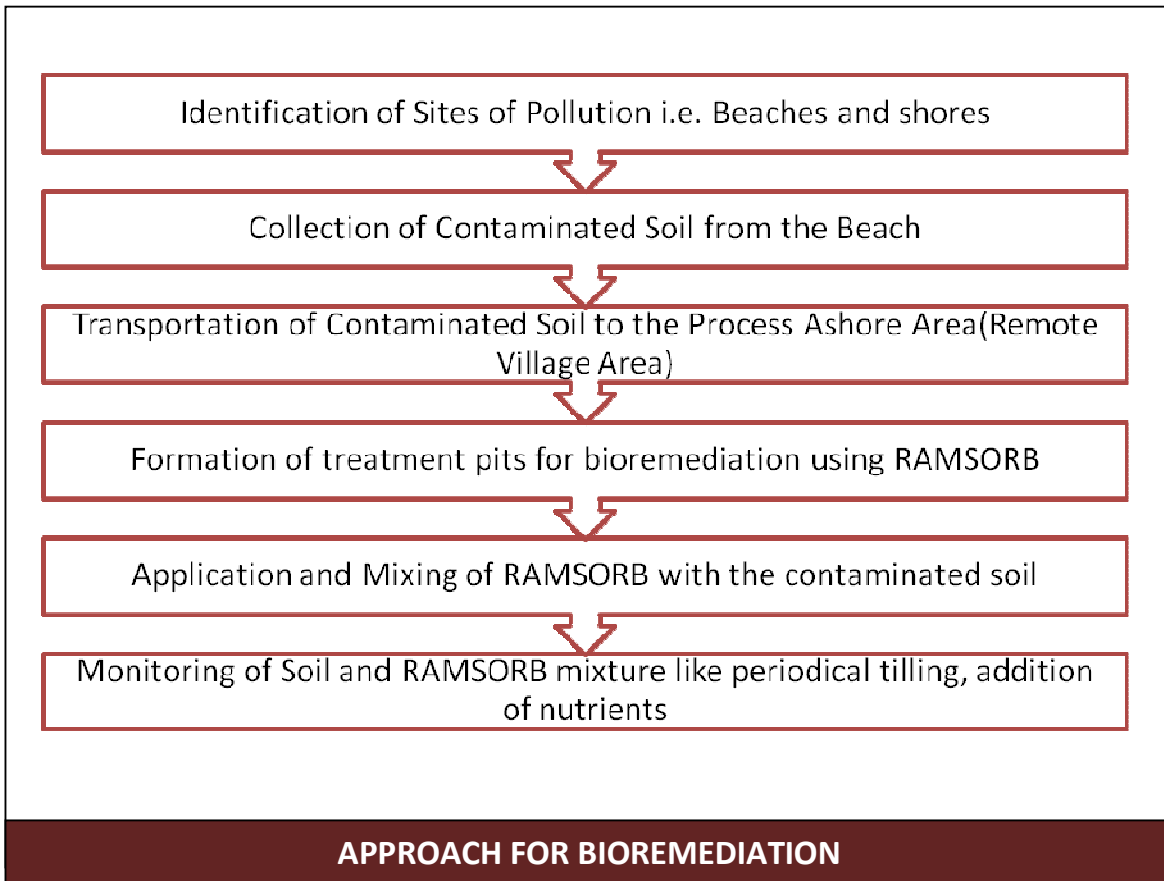
The tar balls are still surfacing from the sea. Because of the high tide they are still getting washed ashore. One of the most affected beaches is Velsao beach located nearly 35 km, as the tar balls had gathered at least a foot thick along the beach. The tar balls are due to an oil spill somewhere in the seas off Goa.

Drishti Response Services is the beach management agency don't have specialised gadgets to clean up beaches. We have put labourers who are using brooms to clear the balls (tar) and dump them ashore. The debris will be taken care of by the local authorities.

According to the Goa-based National Institute of Oceanography (NIO), a marine research organisation, one of the common causes for such a slick is dumping of oil overboard by a passing ship.

METHODOLOGY

The following methodology has been proposed for the bioremediation of the contaminated soil collected from the beaches and shores in Goa. It is proposed that the significant results could be obtained in a period of 4-6 months.



SOIL MANAGEMENT AND BIOREMEDIATION PLAN

A cleared area will be taken as the remediation work site. A berm will be built around the remediation area and the area will be lined with plastic liner. The sand will be collected from the various beaches and will be spread evenly in depth. A line of oil absorbent booms will be set up around the outside of the contaminated soil to contain the hydrocarbons that might leach out of the contaminated soil.

The soil will be bio-remediated using a proprietary hydrocarbon degrading absorbent (RAMSORB-I) along with micronutrients and other chemicals. The RAMSORB will be evenly applied to the soil and then thoroughly mixed with the soil using tilling equipment.

For proper monitoring of the bioremediation process, soil samples will be taken after the initial treatment at approximate intervals of 30 to 45 days to monitor the hydrocarbon reduction. Also, at regular intervals, the soil will be re-tilled for oxygenation and nutrients added if necessary to ensure the proper conditions for the bioremediation bacteria until the project is complete, i.e. contamination is at the acceptable levels.

DELIVERABLES:

Detailed study reports and monthly plans will be submitted to the concerned authority once the work will be awarded to us. Apart from this, a quarterly report outlining all soil management, bioremediation, TPH testing and any other site activities will be submitted to you until the soil contamination levels becomes acceptable.

TEAM INVOLVED:

A team will be involved for the said work along with the local hires for tilling, dredging, collection and mixing jobs.

S.No.	Name	Designation	Email ID	Mobile No.
1.	Mr. Navneet Mathur	CEO		5100253
2.	Mr. Nimish Mathur	Partner	nimishm@greenappletech.in	9310511682
3.	Mr. Safar Md. Khan	Area Sales Manager(WEST)	skhan@greenappletech.in	9326067912
4.	Ms. Ritika Gupta	Area Sales Manager(NORTH)	rgupta@greenappletech.in	9311069555
5.	Mr. Kunal Chakraborty	Area Sales Manager(EAST)	kchakraborty@greenappletech.in	9378490555

PRODUCT LINE

Green Apple Environmental Technologies deal with products specialized in containing Oil Spill in an environmental friendly way.

GAET is the only authorized dealer and is in Joint Venture with the US Based Companies promoting the latest technologies for Hydrocarbon pollution.

- **RAM Environmental Technologies Inc., USA- Manufacturers of “RAMSORB”**

RAM Environmental Technologies Inc. is an industry specialist in the field of petroleum hydrocarbon contamination. In addition to selling and servicing products, RAM is a licensed general contractor providing an on-site remediation services for contaminated soils.

- **ABTECH Industries, USA- Makers of Smart Sponge**

AbTech Industries originally certified its Smart Sponge technologies for Oil Spill Recovery in 1996 under the name of OARS (Oil Aquatic Recovery Systems). Since that time AbTech focused on Stormwater, Industrial, Military, and other applications, and is deployed in over 13,000 locations, in 36 states, and various countries around the world.

A) RAMSORB- A GREEN APPROACH TO REMEDIATE OIL SPILLS

RAMSORB is a hydrocarbon absorbent product that contains indigenous petroleum-digesting bacteria within its cellulose structure. The unique encapsulation properties of RamSorb® augment wicking of hydrocarbons from surrounding soil when mixed by tilling. The hydrocarbons remain encapsulated until degradation is complete while preventing leaching to surrounding soils.

We prefer bioremediation to other clean-up technologies for several reasons. Bioremediation minimizes physical disruption to the site. In many cases, soils may be remediated in-situ. Soils that require excavation may be treated onsite and reused as backfill material. This reduces overall cleanup costs by eliminating the need for disposal, transportation and backfill material.

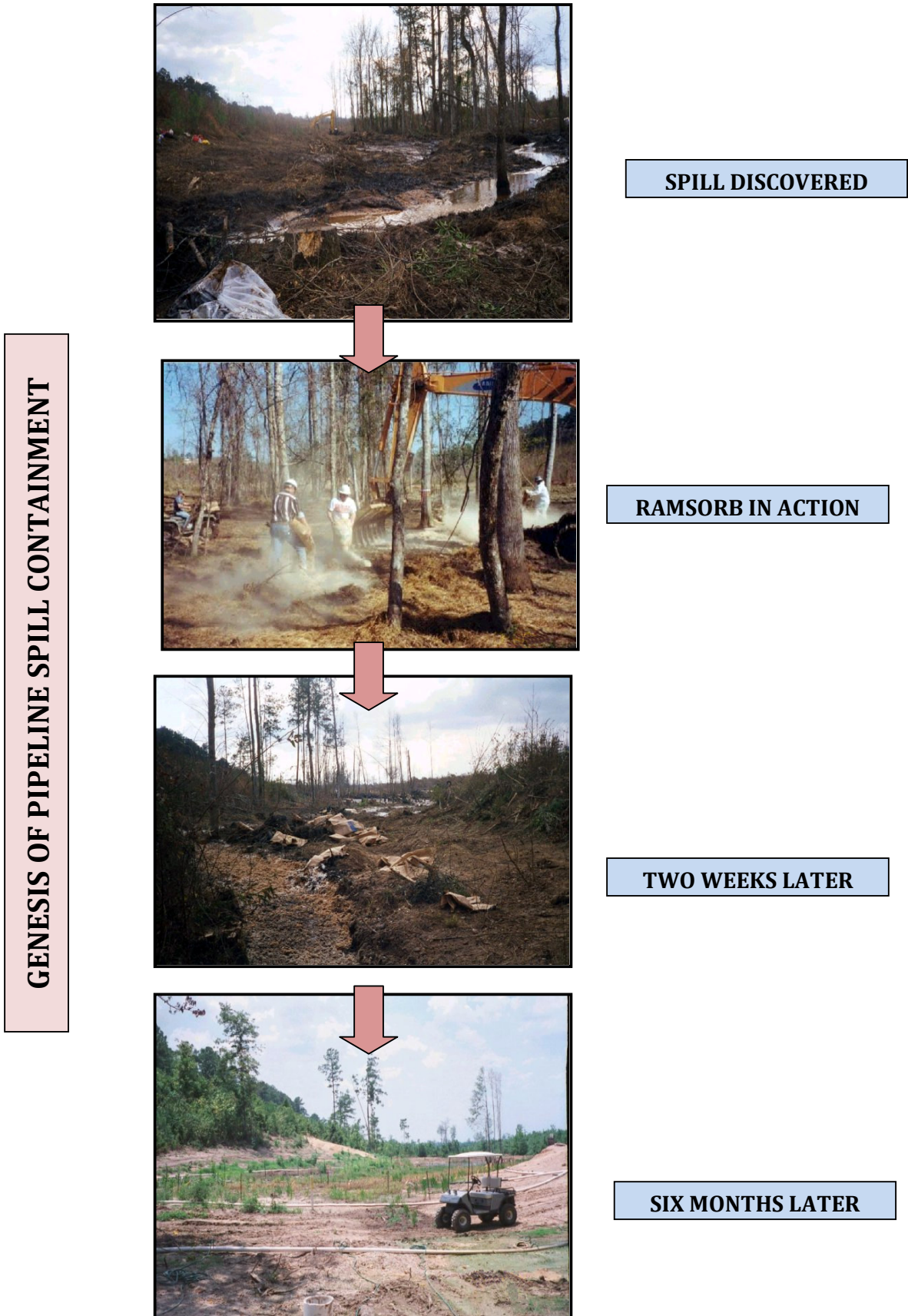
In addition, bioremediation offers a unique and complete solution to petroleum contamination. While bioremediation transforms contamination into ecosystem friendly molecules, other technologies only transfer the contamination to another site.

Bioremediation reduces and in most cases eliminates liability issues. Other technologies may expose the generator to greater liabilities in the future.

Our product RAMSORB detoxicates the affected farming land by oil spillage in a short period resulting in a green pasture land. RAMSORB is not only economically feasible proposition but also an environment friendly application. It has a tremendous potential within the country and abroad.

The strong wicking action of "RamSorb" acts as a physical emulsifier by actually extracting hydrocarbons from less absorptive material. It encapsulates the fine droplets until the available hydrocarbons are consumed as food for the active bacteria.

Application of "RamSorb" is relatively simple. "RamSorb" is applied by blending the dry absorbent with the contaminated soil as effectively and efficiently as possible. Once the hydrocarbon contacts the "RamSorb," it is completely encapsulated (up to the saturation level) and cannot be extracted by naturally occurring contact with water. Even when wet, "RamSorb" will actually give up water to take on hydrocarbons. This extraordinary characteristic separates "RamSorb" from all other absorbents and allows the exceptional bacterial remediation to occur.



RAMSORB-I

RamSorb I is a light-weight, non-toxic, 100% natural, cellulose, industrial strength absorbent that gives you fast, cost-effective cleanup of spills. This hydrocarbon absorbent is economical and easy to use, non-abrasive and will not harm machinery.

- Absorbs up to 6 times its weight and leaves a clean surface
- Contains natural bacteria that degrade petroleum hydrocarbon
- No danger of airborne silica Passes leachate test and paint filter test
- Completely encapsulates and prevents leaching
- Reduces disposal costs and waste generation
- 1 bag of RamSorb I is equal to 10 bags of "Kitty Litter" type absorbents

RamSorb I encapsulates the contaminant, is biodegradable and is completely safe for you and the environment.

RamSorb I picks up hydrocarbons from land and water so it is harmless to plant and animal life. RamSorb I may be used in swampy areas where it is difficult for crews and machinery to clean a spill. It is most efficient on land spills where a safe, residual dressing of the ground will encapsulate a spill and will not allow the spill to leach back into the soil.

RamSorb I can be used to clean up oil-soaked ground by simple cultivation (tilling) methods. Such areas include tank storage, fueling locations, oil production sites, oil field pipe treatment yards, fuel / oil / paint / coolant spills on roadways and/or highways.



***** Details of other products and Material Safety Data Sheet are attached herewith as Annexure.**

B) ABTECH SMART SPONGE TECHNOLOGY

Smart Sponge is a patented blend of oleophilic polymers that readily encapsulates, permanently bonds, and solidifies petroleum hydrocarbons and other contaminants on contact while not absorbing water. Smart Sponge has high porosity, with a very high surface area, to maximize oil absorption. Each unit of Smart Sponge absorbs, on average, 3.5 times its weight in oil, has positive buoyancy when saturated, is non-toxic and non-time sensitive as to recovery.

Based on ASTM F716-82 (1993)el, Smart Sponge has achieved 10-minute absorption rates of 8.6:1 for Kuwait Light Crude and 3.4:1 for North Slope Crude. Extensive research since 1993 – including spilled oil tests in Aruba and at the U.S. Department of Interior’s National Oil Spill Response Test Facility – has optimized product formulation.



AbTech’s line of Spill Control products are designed to remove sheen levels of hydrocarbons. Heavier concentrations of oil, mousse, or tarballs are not effectively removed by Smart Sponge, as these “thicker” products will clog the Smart Sponge filter.

SMART SPONGE ACTIVITY IN THE GULF

Since the spill occurred in the Gulf in Late April, AbTech has been registered with the Deep Horizon Command Center, and has submitted numerous proposals to the Interagency Alternative Response Technology Assessment Program (IATAP). We are in various phases of testing in the Incident Command Centers, and have been acknowledged by the U.S. Coast Guard as having a “Potential for Benefit”.

AbTech is registered as a vendor in Louisiana, Mississippi, Alabama, Georgia, and Florida. We have submitted proposals on our own, with various consortiums (using the AbTech brand media), and are working with contractors in the Gulf region, all in an effort to have our products help protect this precious environment.

BENEFITS OF SMART SPONGE

- Removes or reduces sheen
- Does not absorb water
- Transforms pollutant into a stable solid waste
- Capable of remaining completely buoyant even after being saturated with hydrocarbons
- Oils will not leach or leak