MTBE Ground Spill Remediation

Below is an email [reproduced as sent to Verde personnel with editing only for formatting onto paper and viewer readability]. The Environmental Compliance department manager requested that we not print his name and his facility name. The original is on file at Verde Environmental, Inc. headquarters in Houston, Texas:

>From: " ----- ---------"
>To: "'bscogin@micro-blaze.com'"; "'Fellers, Wayne (Verde)'" waf16@hotmail.com

>Subject: FW: MTBE Spill
>Date: Fri, 15 Jun 2001 15:19:31 -0500
>
> > *Re: Final Response Actions, Reportable Spill: "XXX Facility - Company X", Houston Texas*
> >
> > Company X, Houston facility, has completed the final response actions as provided under 30 T.A.C. Chapter §327, Spill Prevention and Control, covering a reportable release to the environment. As required under section §327.5, Company X submitted a written description of the response actions including efforts made to control the spill; to minimize the impact to the public health and the environment; and to manage the generated waste. The remedial investigation was conducted in accordance with project guidance provided by TNRCC Region 12.
> >
> > **BACKGROUND**
> >
> > Initial notifications concerning the release were provided as follows:
> >
> > Approximately 1800 gallons of an off-specification Methyl Tertiary Butyl Ether (MTBE) product was released above grade to the environment during transfer to a facility storage tank. The tank was overfilled through a unit run-down line, spilling the hydrocarbon product to an earthen bermed containment area (Figure 1) *[Not available-Verde.]*.
> >

To help manage the release, a bioremediation agent (MicroBlaze) and water were immediately applied by emergency response personnel using a 750 GPM fixed monitor and foam eductor. One 55 gallon drum of MicroBlaze was used on the initial emergency response effort. The recoverable product was returned by a vacuum truck for reprocessing to the MTBE manufacturing unit. The contaminated process water was collected and routed to the plant biological treatment unit and discharged to a permitted outfall. Where necessary, soils discolored with hydrocarbon and cleanup materials, were removed and drummed for disposal.

> > Following the initial response actions, the affected soils were tested and treated for the presence of residual hydrocarbon using MicroBlaze. The composite sampling tests indicated a nominal presence of hydrocarbons to a depth of 3 to 5 inches. Elevated MTBE levels were also found at the furthest extent of the spill, sample location TX-1 (Figure 1). First approved by TNRCC Region 12, the remedial methods included application of a bioremediation agent (MicroBlaze) with a soil aeration system to enhance hydrocarbon extraction.

Plant air was supplied through a perforated piping (PVC) grid installed at a depth of 6 to 10 inches in the affected area. The system was operated continually over a two month period with intermittent re-application of the bioremediation agent. The soil was also kept moist using an above ground sprinkler system. A third party contractor was secured to perform the instillation of the aeration system and the tilling of the soil.

> >

> >

> >**SUMMARY**

> >

> > Company X has completed the final spill response actions for this event as provided under 30 T.A.C. Chapter §327, Spill Prevention and Control. The spill occurred above grade into an earthen containment area provided for in-plant storage tanks. As required under section §327.5, the site specific actions were conducted in accordance with project guidance provided by TNRCC Region 12. Company X submitted an initial written description of the response actions including efforts made to minimize the impact to the public health and the environment. The results of the subsequent remedial investigation confirm that the proposed site specific treatment was effective at reducing elevated MTBE levels in the soil.

> >

> >The sampling results are contained in the attached table (Table 1). A copy of the initial notification letter, final soils analysis for sample point TX-1 . *[Not available – Verde]* and MSDS for the bioremediation agent are included as attachments.

> >

> > Thank you for your assistance with the closure of this project.

> >

> >

> >

> **> TABLE 1:**

> > **SAMPLE I.D**

> >

> > DATE (sample)	TXPET-1 MTBE [ppm]	TXPET-2 MTBE [ppm]	TXPET-3* TPH[ppm]
> > 09/21/00	177	0.104	5,500
> > 11/02/00	27.6	N/A	N/A
> > 02/01/01	18.4	N/A	N/A
> > 03/26/01	< 0.5	N/A	N/A

> >

> > * Composite sampling

> >

MTBE Tank Cleanup Procedures

Below is a letter copied to us by the author in regards to an inquiry concerning the cleaning of MTBE tanks at his Gulf Coast area refining facility. [Editing was done only for reader clarification and formatting.] The original email is on file with Verde Environmental, Inc., Houston, Texas.:

John,
> >
> > The following are good practices to follow when cleaning up equipment/tanks.
> >
> > 1. Get process equipment below 130 deg. F before starting Micro-*Blaze [meaning Micro-Blaze® Emergency Liquid Spill Control – Verde]*. Hot temp's will kill the microorganisms.
> >
> > 2. Pump out any residual material before making an application. If you can steam out the hydrocarbon please do so before making an application of Micro-Blaze.
> >
> > 3. Get as much Oxygen into the system as you can. The more of the residual material that you can get out initially the better you will be down the road. Open a top manway or high point bleed while making your application - the more O2 the bugs get the more they reproduce and the more they eat.
> >
> > 4. Circulate the Micro-Blaze solution as much as you can. The more agitation you have, the better it works. If you have access to a portable drum and circulation pump, use it. You can premix your 1-6% Micro-Blaze solution in that drum or use an in-line eductor (1-3% works well for us).
> >
> > 5. More is not always better - We started cleaning up units with a 6% Micro-Blaze solution. We now use a 1% solution. If the can circulate and get Oxygen to the solution, the 1% solution will triple its population in about 1 hour.
> >
> > Some of the calculations that we ran for you tank were as follows:
> >
> > 100' diameter X 30' tall
> > Legs set down on pad at 6' 4"
> > This would give you 7850 cu ft. or 1,800 barrels of material per foot.

> > 3" of Micro-Blaze Spill control in your tank = 450 barrels of solution or 18,900 gallons @ 1% concentration of Micro-Blaze = 189 gallons or 4.5 barrels.

> > 6" of Micro-Blaze Spill control in your tank = 900 barrels of solution or 37,800 gallons @ 1% concentration of Micro-Blaze = 378 gallons or 9 barrels.

> > 12" of Micro-Blaze Spill control in your tank = 1800 barrels of solution or 75,600 gallons @ 1% concentration of Micro-Blaze = 756 gallons or 18 barrels
> >
> > You will need to take into account your vapor space. The only way to get rid of it is by vapor/liquid contact with your Micro-Blaze solution.

> > We have not tried this idea, but we were thinking about renting a compressor and sucking the vapor space down in the tank thus reducing the time it would take to rid our tank of the VOCs - just an idea!
> >
> > In the past we have found:

> > * **Equipment cleaning** - Micro-Blaze has been used to decontaminate towers prior to entry by circulating a Micro-Blaze solution through the towers. Cleanup time was reduced by 24-hours during one turnaround, and by 36-hours in another. The second turnaround was on a Butadiene extractive distillation tower section. Micro-Blaze cleaned the equipment to below the .1 ppm Butadiene action level.
We also use Micro-Blaze to decontaminate tanks (both spheres and atmospheric tanks) prior to entry. Exchangers and pumps are also decontaminated prior to pulling using Micro-Blaze. In each case, Micro-Blaze works better if you are able to circulate the material through the equipment with a high point bleed open to maintain the oxygen content in the vessel.
Micro-Blaze works particularly well on the aromatic solvents used in our various processes.

> > * **Spill Control** - we have several spill control ponds located around our facility. A 600 gallon MTBE spill was routed to our south spill pond. **In just over 2 hours, 25 gallons of Micro-Blaze applied at a 6% concentration eliminated the MTBE.** [Bold lettering ours. – V.]
Our west pond is approximately 100' X 100'. It was completely covered by a layer of oil. A 1% solution of Micro-Blaze was applied to the surface of the pond using the deck gun on our fire engine. In less than 2 hours the oil was gone.
In another spill event, a flange gasket failed spilling 1400 pounds of MTBE on the soil in our tank farm. Micro-Blaze was applied to both suppress the vapors and mitigate the spilled MTBE. Soil testing by an outside cleanup firm showed the soil to be free of MTBE, with no further cleanup actions required to meet regulatory cleanup levels (TNRCC).

> > * **Emergency Response** - on two separate occasions, oil containing hydrocarbons (fat oil) was improperly routed to our API drain system. Once the oil entered the drains, the hydrocarbons were liberated resulting in flammable gases exiting API drain hubs throughout the plant. The Emergency Response Team began applying Micro-Blaze at various "hot spots" throughout the drain system. *Not only did the Micro-Blaze help suppress the vapors, it also eliminated both the oil and hydrocarbon trapped within the drain system. [Italics ours. –V.]*
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