



PANACEA / FLORIDA

Working with Advanced Environmental Technologies (AET), GBI personnel installed a *Butane Biostimulation Technologies*[™] treatment system at a Site located in Panacea, Wakulla County, Florida on March 31, 2004. The Site is a former BP gasoline station. During groundwater monitoring, several contaminants of concern were detected above the Florida Groundwater Cleanup Target Levels (GCTLs). The highest concentration of BTEX constituents and MTBE were noted in a compliance well. In addition, previous groundwater analytical data collected at the Site demonstrated lead concentrations which exceeded the GCTL of 15 µg/l.

Based on a Supplemental Site Assessment (SSA) Report prepared by AET and submitted to the Florida DEP, AET recommended that remedial actions outlined in a Remedial Action Plan (RAP) be implemented as soon as possible. The use of *Butane Biostimulation Technologies*[™] was proposed to and accepted by the Florida DEP in a RAP prepared by AET on January 10, 2003. The *Butane Biosparging*[™] system is designed to treat groundwater by employing an engineered system to enhance biological destruction of contaminants *in-situ* by promoting the growth of naturally-occurring butane-utilizing bacteria. Butane and air are injected below the water table, promoting growth of the bacteria, and the butane-utilizing bacteria then degrade contaminants by direct metabolism and cometabolism. Contaminated soil in the unsaturated zone and capillary fringe is also treated *in-situ* by promoting the growth of butane-utilizing bacteria. A conventional soil vapor extraction system was installed at the Site concurrently with the *Butane Biosparging*[™] system to control VOC emissions.

BUTANE BIOSTIMULATION TECHNOLOGIES[™]
Site Photos



**Summary of Groundwater Quality Data
Panacea, Florida
System Startup in April 2004**

Sample Location	Sample Date	Analytical Method	Benzene	Toluene	Ethylbenzene	Xylenes	MTBE	Naphthalene
MW-3	1/7/2004	8260 VOCs	4.3	<1.0	2.8	<1.0	4.0	NS
	6/23/2004	8260 VOCs	<1.0	<1.0	<1.0	<1.0	<1.0	NS
MW-5	1/7/2004	8260 VOCs	5.7	<1.0	3.4	<1.0	1,400	NS
	6/23/2004	8260 VOCs	15	<1.0	<1.0	<1.0	31	NS
CW-1R	1/7/2004	8260 VOCs	18	<1.0	1.1	3.4	709	NS
	6/23/2004	8260 VOCs	2.5	<1.0	<1.0	<1.0	60	NS
CW-3R	5/5/2003	8260 VOCs	12	<1.0	<1.0	<1.0	14.1	NS
	6/23/2004	8260 VOCs	<1.0	<1.0	<1.0	<1.0	1.4	NS
CW-4R	5/5/2003	8260 VOCs	226	8.2	58.6	54.5	241	NS
	6/23/2004	8260 VOCs	300	<1.0	<1.0	<1.0	1,600	NS
Florida Drinking Water Standard			1.0	40	30	20	50	20

NOTES: All concentrations expressed in µg/l (ppb)
 NS = Not sampled / reported
Bold values exceed Groundwater Cleanup Target Level
Yellow shading indicates pre-treatment concentrations

REFERENCES

Advanced Environmental Technologies
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