

gPRO[®] HP

Pump & Treat Optimization



inVentures
Technologies
incorporated

www.gasinfusion.com



Tired of Pump & Pump & Pump & Treat?

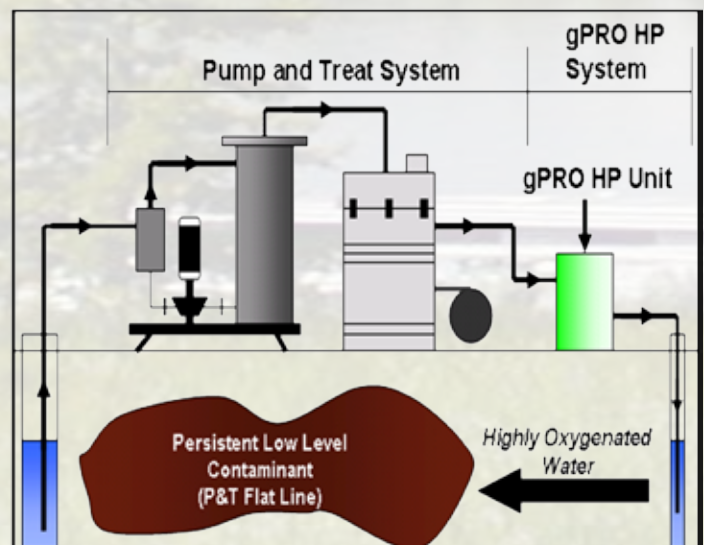
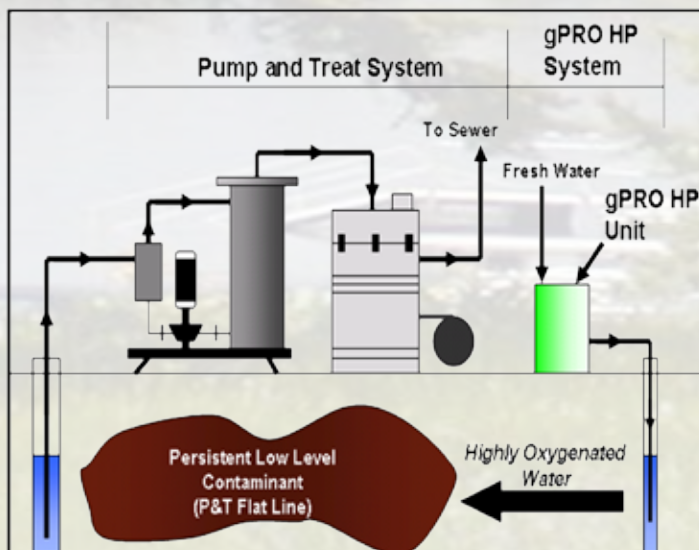
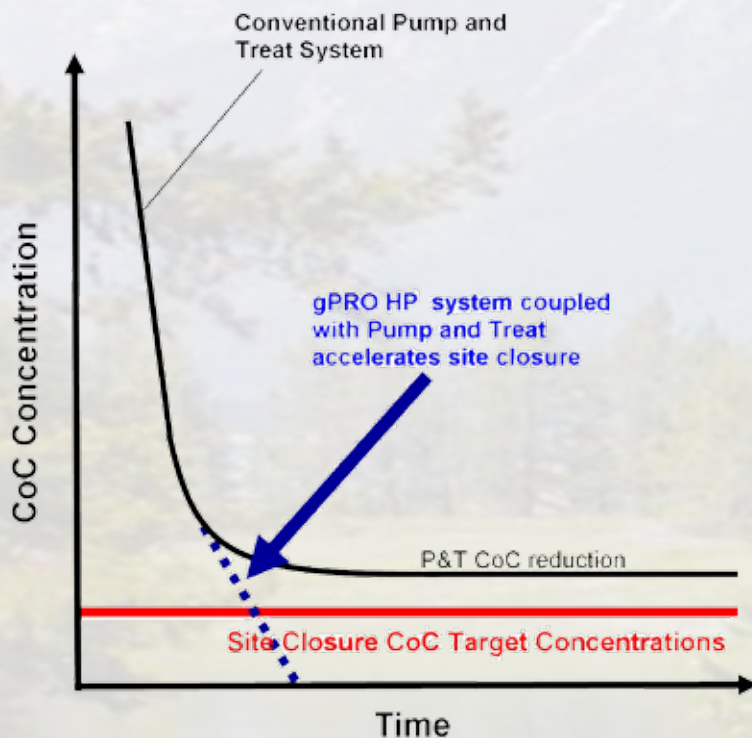
Let's face it, there are thousands of Pump and Treat sites out there that after months and years of operation are not reducing ground water contamination but are asymptotic (flat-lining) which means that the Pump and Treat system has reached its limit of effectiveness. The remaining stubborn groundwater contaminants keep the site above Site Closure Standards. Eliminate the tough low level contaminants in situ using the groundwater Pressurized Remediation Optimizer (gPRO®) High Pressure (HP) System to optimize your remediation systems and your close sites permanently.

gPRO® HP Adds the In Situ Bio-Component to Pump and Treat Systems

Pump and Treat systems stagnate because contaminants are slow to desorb from the soil matrix and are slow to diffuse from low permeability zones.

gPRO® HP combats these contaminants by adding massive amounts of dissolved gas that:

- Stimulate the growth of naturally occurring microorganisms to consume the contaminants
- Activates naturally occurring bio-surfactants that increase solubility and dispersion of contaminants



Close Asymptotic Sites



gPRO® HP 4 System

gPRO® HP for P&T

Increased In Situ Bioactivity

- Drastically reduces Pump and Treat times
- Higher dissolved gas levels at ambient pressure
- Increased biological degradation rates

Flexibility

- Lower power consumption and installation unit costs
- Use of 1/2 inch or larger diameter injection wells
- Inject discharge water or fresh water
- Simple controls
- Easily retrofitted, small, mobile supersaturating gas unit

No Sparging Issues

- No gas loss
- No risk of vapor intrusion
- No preferential pathways
- No off gassing
- No gas entrapment leading to mounding

How gPRO® HP Works

Consists of two parts; gPRO® HP production and gPRO® HP delivery:

gPRO® HP Production

- Delivered gas fills the hollow fibers
- Pressurized water flows past the hollow fibers
- Mass transfer occurs transferring gas into the high pressured water
- For a gas such as oxygen 25-150 mg/l of dissolved oxygen can be produced
- Dissolved gas levels can be adjusted to suit specific conditions

gPRO® HP Delivery

- The gPRO® HP distribution header and any number of lines are deployed to groundwater inFusion wells
- Pressure is regulated to guarantee bubble-less injection
- gPRO® HP delivery process ensures dissolved gas is not lost to the atmosphere

gPRO® HP4 Unit Oxygen Transfer

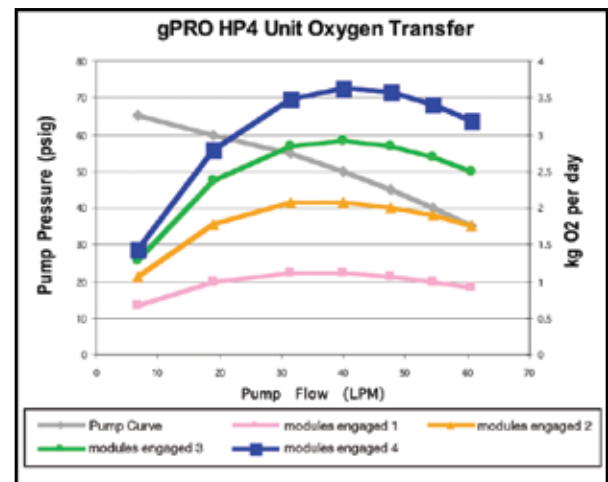
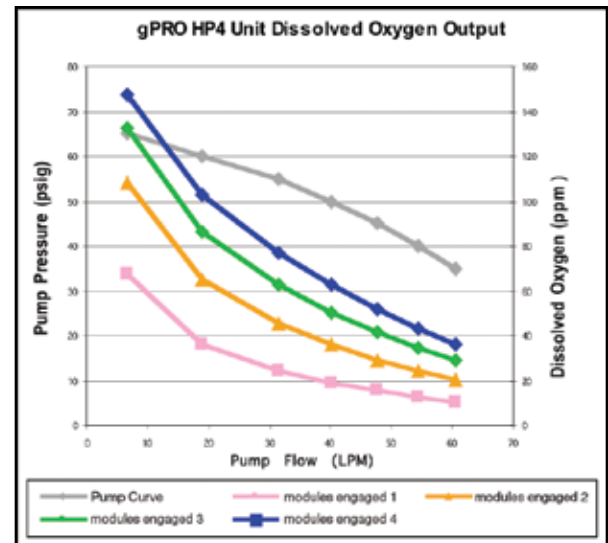
GPM	LPM	psig	1 Unit Engaged		2 Units Engaged		3 Units Engaged		4 Units Engaged	
			DO (ppm)	Kg/Day	DO (ppm)	Kg/Day	DO (ppm)	Kg/Day	DO (ppm)	Kg/Day
16	61	35	11	0.9	20	1.8	29	2.5	36	3.2
15	55	40	13	1.0	24	1.9	34	2.7	43	3.4
13	48	45	16	1.1	29	2.0	41	2.8	52	3.6
11	40	50	19	1.1	36	2.1	50	2.9	63	3.6
8	31	55	25	1.1	46	2.1	63	2.9	77	3.5
5	19	60	36	1.0	65	1.8	87	2.4	103	2.8
2	7	65	68	0.7	109	1.1	132	1.3	147	1.4

gPRO® HP4 Specification

Heavy-duty rigid steel frame	NEMA 4 control panel
Powder coated paint	Water Inlet 1-¼ inch
Length: 36 inches (92 cm)	Water Outlet 1 inch
Width : 24 inches (60 cm)	Gas Inlet ½ inch
Height: 32 inches (82 cm)	Water Pump ¾ hp – 0.55 k
Weight 110 lb (50 kg)	Integrated oxygen generators optional
Power 120 V - 11 A – single phase	

Note:

1. The gPRO® HP groundwater system supersaturates water exceedingly quick and ultra efficiently.
2. gPRO® 8 HP and gPRO®12 HP units with much larger gas transfer and fluid flow ratings are available.
3. Custom gPRO® HP units can be designed and provided to integrate with the most complex water handling systems and remediation equipment.
4. The remediation specialist should take the aquifer capacity into consideration when choosing the size of gPRO® HP unit for the application.
5. gPRO® HP units can be easily controlled through module engagement and cycling to provide the best remediation solution for given aquifer conditions.
6. inVentures has qualified staff to advise the remediation specialist in the most effective implementation of the gPRO® HP system.



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- Proven Technology — inVentures patented gas inFusion delivery system has been successfully demonstrated at hundreds of installations worldwide
- Quality — All inVentures' products are manufactured with the highest quality components from our dedicated suppliers
- Customer Service — Our experienced, friendly and courteous sales team will rapidly assist you with any concerns

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