

# Containment Protection Design Guide & Catalog 2019



*Leprino Foods - CA*



6" Multi-Flow LDVS Part #06300

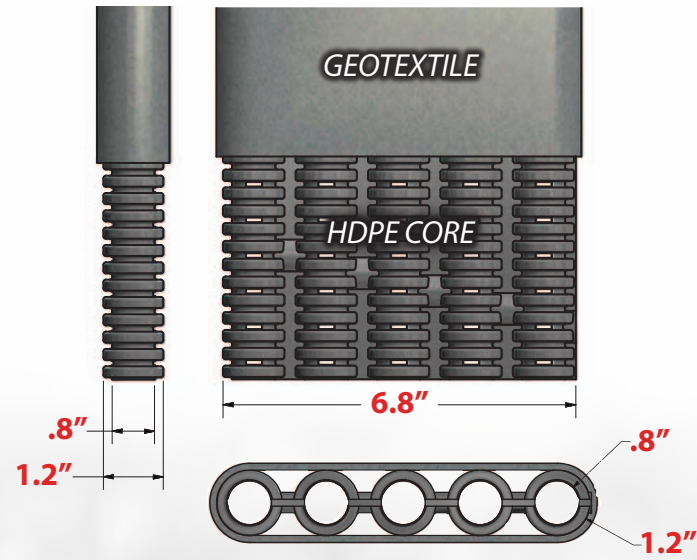
Multi-Flow LDVS Synthetic Liner Protection by Varicore Technologies is an innovative and cost effective system designed to protect synthetic liners from damage caused by gas and fluid accumulation. Providing gas venting, drainage and leak detection in one system is efficient and cost effective. The Liner Protection System utilizes components from the proven Multi-Flow drainage system. The documented strength, capacity and longevity of this system make it a logical choice for many different containment applications.

**MULTI-FLOW** LDVS  
Leak Detection  
Vent System™

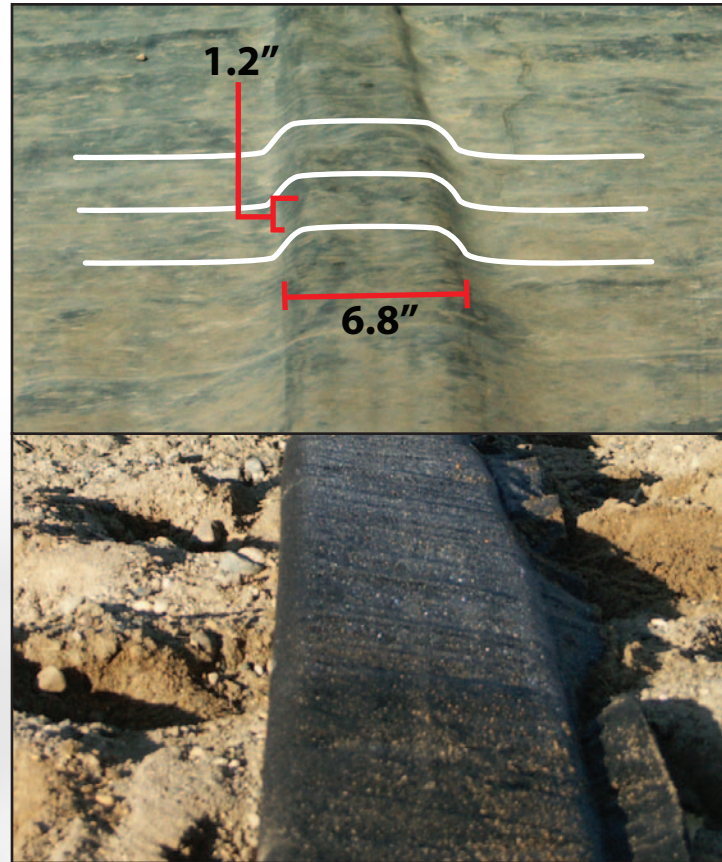
# Product

Multi-Flow LDVS is a collector system sold with a series of connectors, to be installed underneath containment applications. Made of High Density Polyethylene (HDPE), the product is durable, flexible and well-suited to collect and flow fluids/gases effectively and efficiently for many, many years.

## LDVS Cross-Section

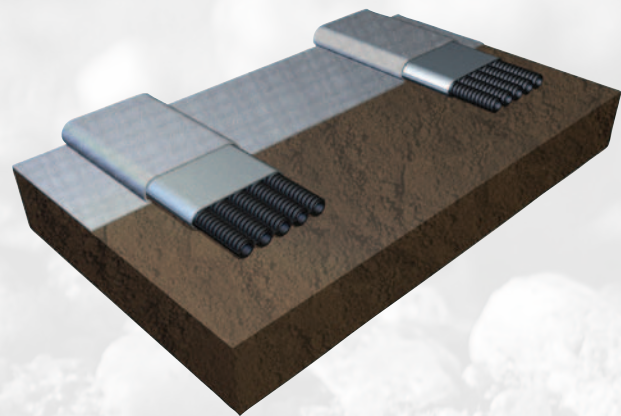


## Product On-Site



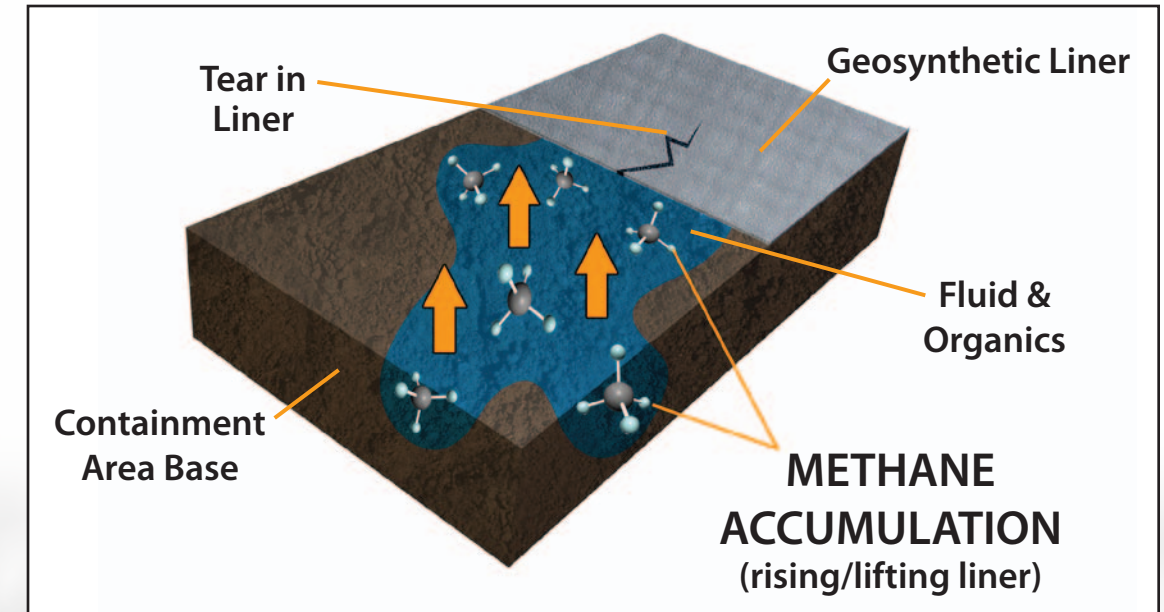
Profile of a Multi-Flow LDVS collector, as installed on the base of containment area, creating minimal footprint.

## Collector Isometric



# Problems with No Mitigation

Despite a myriad of Quality Control measures taken during installation, problems with geosynthetic liners can still occur. Whether it's groundwater, punctures, improper seaming, etc. there exists the possibility for fluids to accumulate under the liner. Microbial action naturally takes place and the result is accumulations of methane gas.



## Resulting in Gas Under the Membrane



Bubbles, or "Whalebacks", Hippos", etc. are becoming a common occurrence in the containment industry. Many times the problem begins and grows for years before being noticed, as the inflated pocket/pockets must reach a certain height before breaching the surface. With no mitigation in place and with either leakage, groundwater intrusion or soil organics, it can take only a few years for bubbles to form and even more years to know the problem even exists.

## Not All Products Created Equal

### Other Product

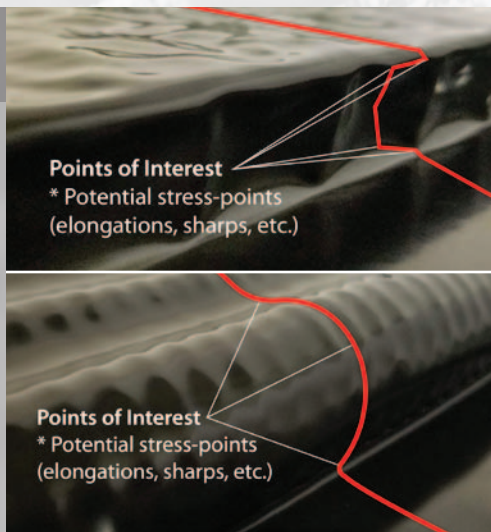
- Potential "Sharps"
- No Flow Channels
- Poor Angular Strength

There have been other products available that might now be marketed for the same use as Multi-Flow LDVS. However, they are not the same.

### Multi-Flow LDVS

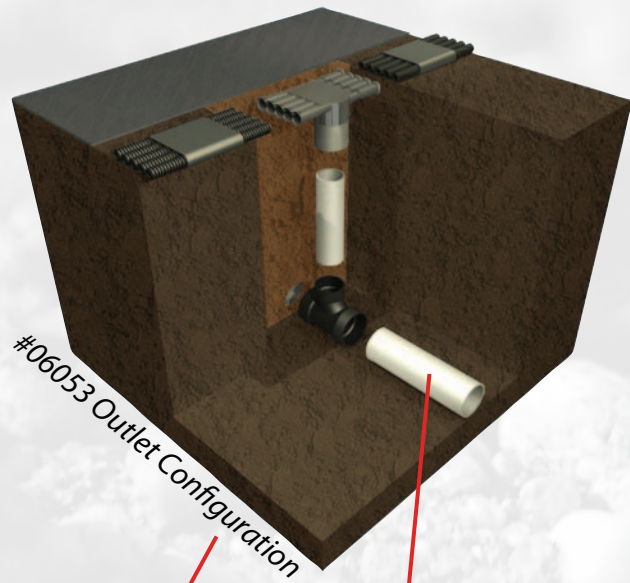
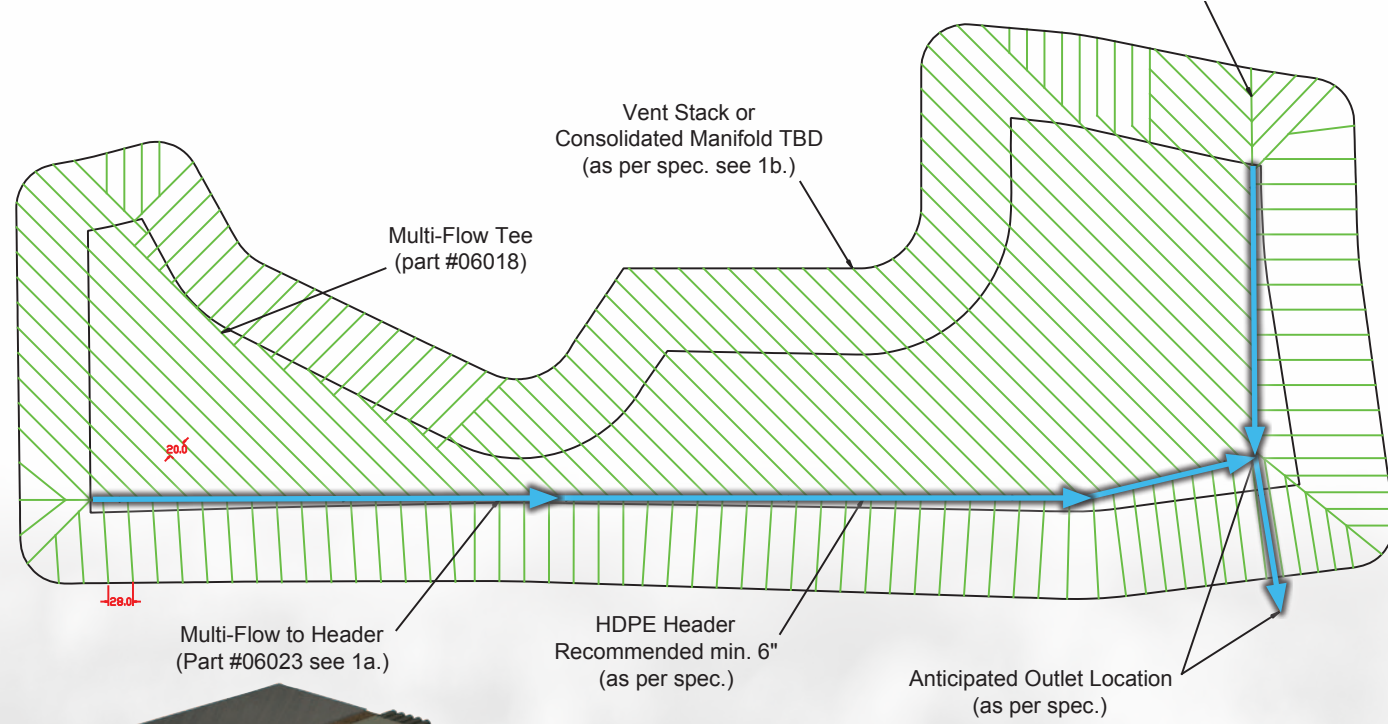
- Smooth Contour
- Zero "Sharps"
- Dedicated Flow Paths
- High Loading Ability
- Dedicated Connectors

Some, termed "waffle drains", "drain boards" or others can work for drainage, but because of poor design quality, they simply don't allow for the performance, safety and strength of an enclosed core...and will put your liner at risk.



# Drainage

Multi-Flow LDVS is a collector system sold with a series of connectors, to be installed underneath liners in containment applications. Made of High Density Polyethylene (HDPE), the product is durable, flexible and well-suited to collect and flow fluids/gases effectively and efficiently for many, many years.

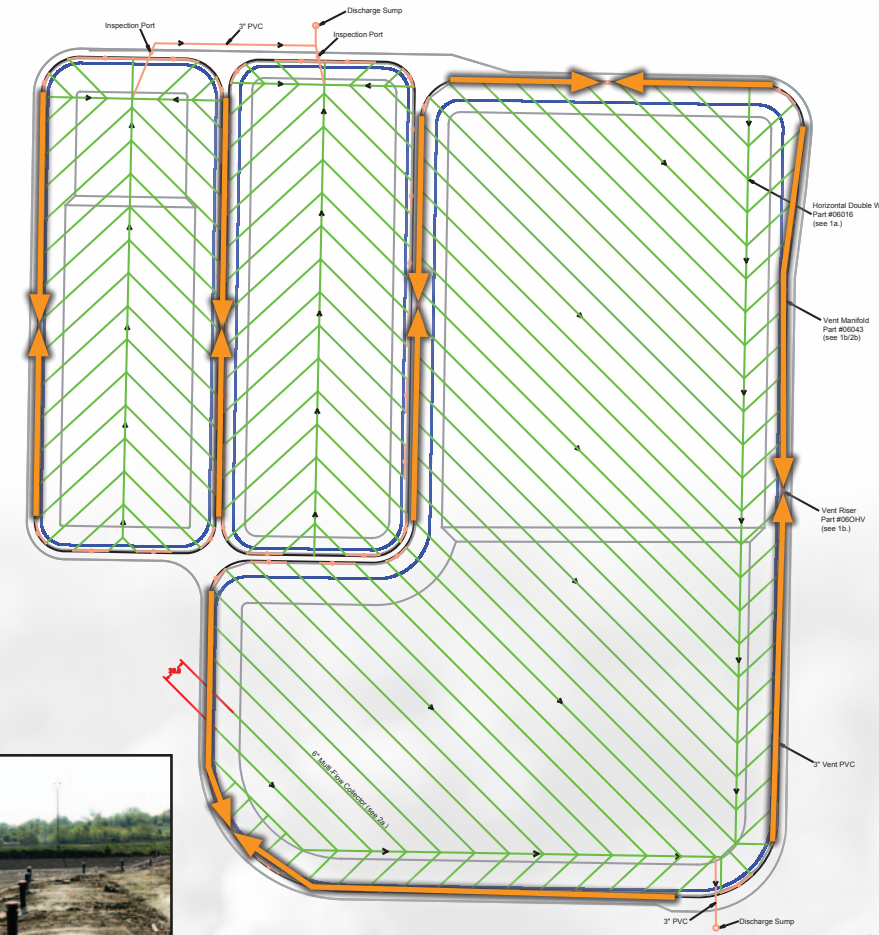


The low point of the Multi-Flow system is typically connected to piping which leads to a pumping/monitoring pit or discharge location. This pit, located outside of the containment area allows groundwater OR leaked fluids to be removed from under the liner with a variety of piping/pumping options. Most importantly, it offers a leak detection inspection point for the system.



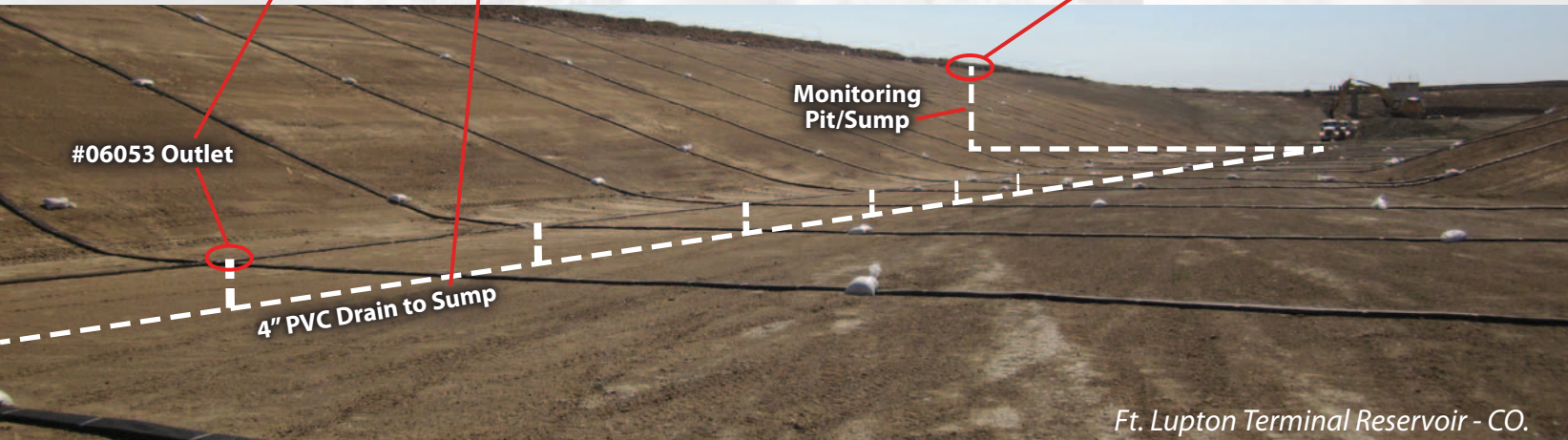
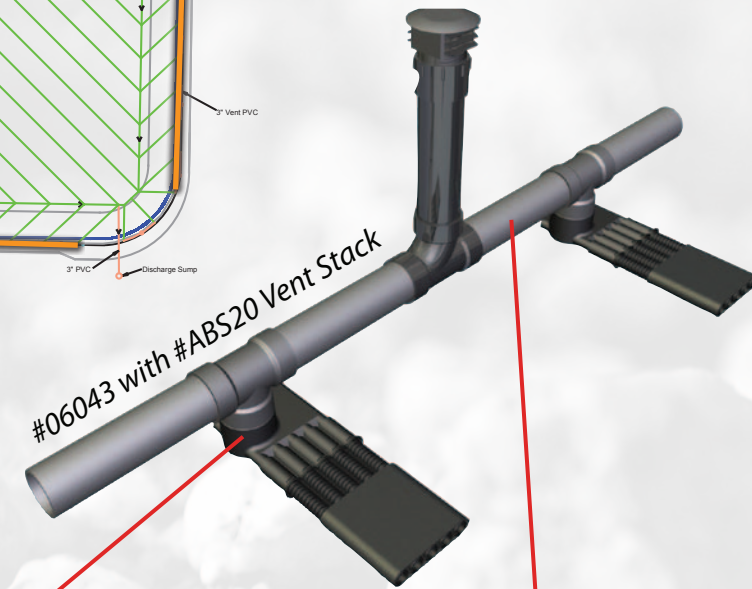
# Venting

Venting options are plentiful with Multi-Flow LDVS. Individual vents or easy-to-assemble manifolds work with industry standard pipe sizes. Whatever your containment requirements, there is a venting option that will save time and money compared to any other method of mitigation.



The high points of the LDVS system are the vents. With a wide variety of venting options, designs to fit almost any application is possible. From individual vent stacks to a series of manifolds, vents can be few or many and spaced in a manner that fits.

Vents may be located inside or outside the containment area...even in the anchor trench. This allows for fewer liner penetrations and an efficient installation with less excavation.



Ft. Lupton Terminal Reservoir - CO.



Hiawatha Brine Lagoons - KS.

# Product

Introduction to our selection of most-frequently used LDVS fittings and Connectors

## Horizontal



**Part #0601N**  
Horizontal 90



**Part #06017**  
Horizontal Tee



**Part #06018**  
Horizontal Cross



**Part #06016**  
Horizontal Double Wye

## Drain/Vent Outlets & Adapters



**Part #06024**  
End Outlet to  
4" Corrugated



**Part #06044**  
End Outlet to  
3" Rigid



**Part #06023**  
Side Outlet to  
4" Corrugated



**Part #06043**  
Side Outlet to  
3" Rigid



**Part #06033**  
Inline Side Outlet to  
4" Corrugated



**Part #06053**  
Inline Side Outlet to  
3" Rigid



Multi-Flow LDVS has a wide variety of fittings and adapters that are simple and purpose-built. With a simple snap-and-lock design, connections may also be secured with PVC tape, for an extra measure of security.

## Common Connectors



**Part #06001**  
6" Endcap



**Part #06002**  
6" Coupler



**Part #ABS20**  
3" Vent, Riser  
w/ threaded cap

# Assemblies

Simple and affordable ways to assemble the drains and vents within the LDVS system

## Drain Connections

A variety of manifolds exist to allow the LDVS system to connect to various pipe types and sizes, from different directions. This allows flexibility in layout and design.



**Part #06033**  
Inline Outlet to  
Standard 4" Corrugated  
Drain Assembly



**Part #06043**  
Outlet to 3" Rigid  
Standard Drain Assembly



**Part #06053**  
Inline Outlet to 3" Rigid  
Standard Drain Assembly

## Vent Connections

With many different options for venting the LDVS, Multi-Flow is incredibly versatile in both design and installation aspects. From individual vents to perimeter piping, the system connects and installs efficiently.



**Horizontal Tee  
w/ inline Vent Riser**  
Parts #06017, #06053  
& #ABS20



**Vent Riser Assembly**  
Part #OHV



**Manifold for Shallow  
Perimeter 3" Rigid**  
Part #0600M



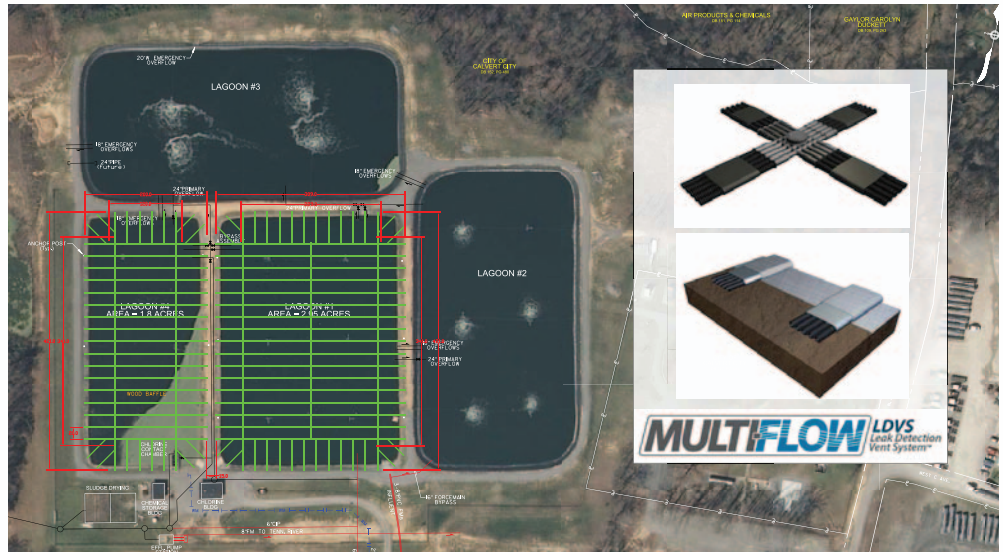
**Manifold to 3" Rigid  
w/ Inline Vent Riser**  
Parts #06043, #ABS20

# Design Assistance

Let us help you save time and energy by proposing a plan

Every containment application is slightly different. Cookie Cutter solutions don't always work. That's why Multi-Flow LDVS is the choice for fluid/gas mitigation systems.

Modular and scalable, the system can be configured in a multitude of ways. We can take your project and propose different solutions that fit your budget and performance requirements.



## Multi-Flow Product Data Sheet - 6" Multi-Flow (#06000)

### Drainage Core

Property	Test Method	Value
Thickness, inches.....	ASTM D-1777.....	1.0
Flow Rate, gpm/ft *.....	ASTM D-4716.....	29
Compressive Strength, psf.....	ASTM D-1621 (sand method)	6000
Perforations / sq. ft.....		125
Standard Roll Length, ft.....		150

### Geo-Textile Filter

Property	Test Method	Value
Weight (oz/sq <sup>2</sup> ).....	ASTM D-3776.....	4
Tensile Strength, lb.....	ASTM D-4632.....	100
Elongation, %.....	ASTM D-4632.....	50
Puncture, lb.....	ASTM D-4833.....	50
Mullen Burst, psi.....	ASTM D-3786.....	200
Trapezoidal Tear, lb.....	ASTM D-4533.....	42
Coefficient of Perm, cm/sec.....	ASTM D-4491.....	0.1
Flow Rate, gpm/ft.....	ASTM D-4491.....	100
Permittivity, 1/sec.....	ASTM D-4491.....	1.8
A.O.S. Max US Std Sieve.....	ASTM D-4751.....	70
UV Stability, 500 hrs., %.....	ASTM D-4355.....	70
Seam Strength, lb./ft.....	ASTM D-4595.....	100
Fungus.....	ASTM G-21.....	No Growth

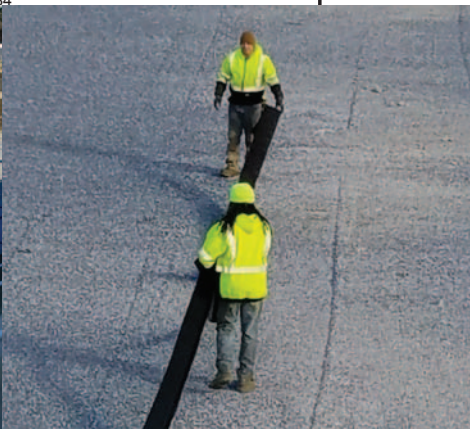


Manufactured by Varicore Technologies, Inc. - Prinsburg, MN 56281 - 800.978.8007

The Multi-Flow logo is Copyright protected, all rights reserved.  
US Patent Protect - 9483745856834

All values given represent minimum average roll values

\* Horizontal Installation, gradient = 0.1, pressure = 10 psi for 100 hours



Energy | Agriculture | Leachate | Industrial | Wastewater Treatment | Mining | Aquaculture

Varicore Technologies, Inc. is the manufacturer of Multi-Flow LDVS. We provide design assistance to meet the needs of specific applications around the globe. Proper planning saves time, money and dramatically extends the quality and longevity of the containment system.

Let us know how we can help with your project!

[ldvs.multi-flow.com](http://ldvs.multi-flow.com)



For Supply Contact: Titan Environmental Containment 1-866-327-1957 | [info@titanenviro.com](mailto:info@titanenviro.com)