Oil and Gas Containment Systems
FACING THE CHALLENGE

Oil and natural gas production is one of the most complex industries in the world. In addition to typical day-to-day business challenges, Oil & Gas companies face growing and often changing pressures from the political, economical, and environmental fronts. On one hand, there is the increasing demand for energy brought about by global population growth and emerging economies. On the other hand, there are concerned citizens questioning the safety and environmental impact of oil and gas recovery methods. Still, everyone wants an abundant supply of cheap energy, leaving the industry to figure out how to provide sustainable and affordable options, while ensuring the health and safety of its workforce, the economic success of the business, and the protection of the surrounding environment.

GSE Environmental can make water and soil contamination one less thing to worry about. We understand the challenges unique to Oil & Gas exploration and production. For over forty years, our geosynthetics have been used to protect soils, ground water and surface water against the harshest contaminants, in the most extreme conditions. We go to the greatest lengths possible to guard the interests of those we serve, so our products are designed to meet or exceed the most stringent regulations that governments develop. In addition to offering a durable product that lasts for years, GSE can respond quickly to tight construction and delivery schedules, ensuring your project stays on time and on budget.
HDPE and LLDPE Geomembranes

GSE High Density Polyethylene (HDPE) and Linear Low Density Polyethylene (LLDPE) Geomembranes have a long history of proven durability and performance in both exposed and covered applications that require resistance to harsh chemicals, UV exposure, and hazardous waste. GSE geomembranes are available in white, green, gray or black, and one or both surfaces can be textured for increased foot traffic stability and frictional resistance on slopes. Standard-sized rolls measure 22.5 or 34.5 feet wide and can be M-folded to less than 6 feet for easy transportation, handling, and field installation.

Leak Location Liner

A revolution in leak detection, GSE Leak Location Liner is an HDPE or LLDPE geomembrane with a fully-integrated electrically conductive bottom surface. This allows quality teams to conduct a spark test immediately following installation and a dipole survey after the liner is covered, for the fastest, most comprehensive leak detection available on the market. While other conductive liners exist, only GSE Leak Location Liner, installed using GSE’s IsoWedge technology, facilitates dipole testing after cover material is placed. Studies have shown that using both spark and dipole survey methods significantly reduce the probability of leaks. Like all GSE geomembranes, Leak Location Liners are available in a variety of colors and surface textures.

High Temperature Liners

GSE High Temperature Liners are high-density polyethylene (HDPE) geomembranes specifically designed to withstand temperatures up to 100°C. At elevated temperatures, standard liners will break down, accelerating stress cracking and oxidation, which leads to leakage. GSE High Temperature liners retain their mechanical properties, even in the elevated temperatures reached during Coal Seam Gas extraction.
GSE BentoLiner GCL
An alternative to traditional compacted clay liners, GSE BentoLiner GCL is a needle-punched composite geosynthetic clay liner, consisting of a layer of high swell, self-sealing sodium bentonite between geotextiles. GSE offers several BentoLiner GCL products designed to accommodate different load and slope requirements, as well as brine-resistant GCL and other products that address the specific challenges associated with oil and gas recovery.

GSE ContainMat
GSE ContainMat is the first composite liner system designed specifically for oil and gas secondary containment solutions. A uniform layer of sodium bentonite is distributed between a woven and a non-woven geotextile. The self-seaming characteristics of the bentonite clay combined with an extra durable polypropylene barrier provide superior leak protection under rigorous oil field conditions. When removal of overlaying contaminated soils becomes necessary, the upward-facing, orange-colored polymer coating acts as a warning layer to crews removing the cover soil, which helps prevent damage. GSE ContainMat is a practical alternative to a compacted clay liner.

Geogrids, Geonets, and Geocomposites
GSE Geogrids, Geonets, and Geocomposites are synthetic drainage and site stabilization products. Manufactured from the highest quality HDPE resin, they are extremely resistant to chemicals commonly used in oil and gas production. They prevent erosion, improve drainage in flood-prone areas, and increase stability under non-improved roads and under worksites that contain soft soils unsuitable for construction. GSE Geogrids, Geonets, and Geocomposites can reduce or replace the required thickness of natural materials by as much as 50%, and they do not require specialized equipment or crews to install. They are also used to create a leak detection zone in double-lined systems.

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Geosynthetic Solutions

GSE Leak Location Geomembranes
An electrically conductive bottom layer allows spark and dipole testing to be performed quickly to detect and repair damage.

GSE High Temperature Geomembranes
A polyethylene geomembrane specially engineered to retain its mechanical and physical properties when exposed to sustained temperatures up to 100°C.

GSE Geocomposite
Made of the highest quality high-density polyethylene (HDPE) resin and non-woven geotextile to transmit fluids and gases uniformly under many field conditions.

GSE BentoLiner GCL
A needle-punched composite geosynthetic clay liner comprised of a uniform layer of sodium bentonite encapsulated between a woven and a non-woven geotextile.

Nonwoven Geotextile
These staple fiber, needle-punched geotextiles are engineered for filtration, soil stabilization, separation, drainage and gas transmission, and liner protection.

Containmat
A composite liner system designed specifically for oil and gas secondary containment. The bright orange color makes it easily distinguishable from cover soils.

UXS Geogrid
A uniaxial HDPE geogrid used to stabilize soils. They resist elongation when subjected to high loads for long periods of time.

SBX Geogrid
A biaxial geogrid used in road reinforcement to add strength and stability and to reduce maintenance costs.

GSE is responsive and service-oriented, helping us provide our customers with a great product in a timely fashion.
Despite the many benefits of fracking, energy companies face some tough challenges:

- Concerned communities question the potential impact on the environment.
- Governments are implementing increasingly stringent regulations to address environmental concerns.
- Fracking requires large amounts of fresh water.
- Companies must responsibly dispose or store flow-back water.
- Chemicals used in the fracking process must be stored responsibly.
- Production sites often are built in remote locations on unstable soils that cannot bear the load of heavy truck traffic.

Fresh Water Holding Ponds
The process of hydraulic fracturing uses up to 1 million gallons of water per well; therefore, having a readily available source of fresh water is crucial to maintaining production schedules and ensuring overall project success. When a well is constructed in a region where water is scarce, energy companies can install large holding ponds to capture and store water for future needs. For over forty years, GSE HDPE and LLDPE geomembranes have been used to line or cover storage ponds and reservoirs, protecting valuable water resources from contamination, evaporation, and leakage.

Flow-Back and Production Water Ponds
During the fracking process, up to 90% of the water used flows back to the surface. These high brine content fluids must be captured and contained in an environmentally responsible manner prior to treatment or re-use. These highly critical applications often are subject to stringent government regulations, and only the most reliable products will do.

GSE Leak Location Liner is the only geomembrane on the market that allows you to conduct leak surveys on both covered and exposed applications, and it is specifically intended for applications where you can’t afford a leak.

GSE Bentoliner Brine-Resistant GCL was engineered to stand up to flow-back waters that contain high brine content. This needle-punched reinforced GCL is comprised of a uniform layer of specially formulated polymer enhanced granular sodium bentonite between two nonwoven geotextiles, and it provides secure containment of the most chemically laden solutions.

Pit Liners
Drill cuttings and spoils extracted from the well hole must be captured and stored in a responsible manner prior to disposal. GSE lining systems are used to line the storage pits and protect groundwater against potential impact.

Well Pad Liners
Well Pad liners cover the active working surface surrounding the well, protecting the soil from potential spills and providing a safe, slip-resistant surface for workers. GSE Geomembranes are chemically inert, highly resistant to UV degradation and can withstand the harsh conditions of a fracking job site. The textured surface increases traction for a safe working environment.
AN EXTRA LAYER
OF SECURITY
Secondary Containment
Various chemicals are blended together and used during the fracking process. These substances must be stored responsibly, but if a leak or spill does occur, it must be immediately contained. GSE BentoLiner GCLs, ContainMat and GSE geomembranes are used under and around tanks, vessels and other storage units to quickly contain spills and leaks, eliminating the threat of contamination. In addition, drainage geocomposites can be placed directly on top of the geomembranes to facilitate rapid drainage of any leaked materials.

For jobsites that require a customized approach, the GSE Fabrication Group can build secondary containment products to meet a project’s exact specifications. Our designers are dedicated to providing the highest quality products by using the latest technologies in our 12,000 square-foot fabrication shop. Our extensive customized-fit experience includes tank liners, oil containment booms, boots, pipes, fabricated pads and temporary containment solutions.

A RELIABLE
FOUNDATION
OF SUPPORT
Road And Worksite Improvement Solutions
Access roads, work platforms, and containment structures often are built on soft or unstable soils that are not naturally suited for construction. Traditional soil stabilization methods are expensive, time-consuming processes that are affected by the weather and require specialized equipment and skilled labor, resulting in excessive production downtime. In addition, the chemicals used in traditional methods can leach out over time, posing a threat to groundwater.

Syntec SBx Biaxial Geogrids provide a quick, long-term, low-cost solution to stabilizing and strengthening roads and worksites and reducing the thickness of aggregate base layers. SBx geogrids are stiff, net-like structures that confine stone and soil particles, preventing lateral shear when a vertical load is applied. Compared to chemical methods of stabilization, SBx geogrids install in any weather, offer immediate, permanent stabilization and typically cost about 20%-50% less.

Syntec UX Series Uniaxial Geogrids are designed to carry high tensile loads over a sustained period of time. These types of loads are common to reinforced soil slopes and mechanically stabilized earth (MSE) walls or berms, which often are critical to operations in areas of diverse topography. Syntec UX Series uniaxial geogrids are well suited for use on oil and gas production sites by leveling the site and maximizing usable production space.

If your site is prone to flooding, GSE offers a complete line of geonets and geocomposites designed to improve drainage. GSE HyperNet and GSE PermaNet are premier synthetic drainage products used to transmit fluids uniformly under a wide variety of field conditions. RoadDrain provides compressive stiffness to support traffic and rapid fluid transmission. These materials are durable under rigorous environmental conditions and ideal for extremely demanding applications.

When drainage filtration is required to keep silt and soil particles from clogging the flow, choose from a variety of GSE Geocomposites, geonets heat-bonded with a non-woven needle-punched geotextile. In addition to supporting platforms and roads, GSE geocomposites can provide added support under pipelines, rigs, cranes and containment berms.
DURABILITY RUNS DEEP

“GSE delivers on our promises to our clients.”

Lance Hill
Hill & Associates
Worldwide Locations

Our business is global because our customers are global. Headquartered in the U.S. and with manufacturing facilities in Chile, China, Germany, Thailand and Egypt, as well as engineering and sales professionals in numerous countries, GSE can provide local service to our worldwide customers.