



The Pioneer Of Geosynthetics  
S I N C E 1 9 7 2

## Golf Courses

Ponds and irrigation reservoirs on golf courses provide both practical and aesthetic benefits. GSE high density polyethylene (HDPE) and linear low density polyethylene (LLDPE) geomembranes provide a cost-effective and quality method of waterproofing these earthen water impoundments. Geomembranes are also used increasingly to remediate leaking clay lined ponds and lakes. GSE is the world's largest manufacturer and installer of geomembrane lining systems. We have extensive experience supplying and installing liners in golf course facilities.



GSE geosynthetic products.

### QUALITY GSE GEOMEMBRANE LINING SYSTEMS

GSE geomembrane products provide a wide range of water containment requirements found on all golf courses around the world, such as decorative ponds and irrigation reservoirs. Our geomembranes provide secure water containment and long-term performance derived from their exceptional material properties.



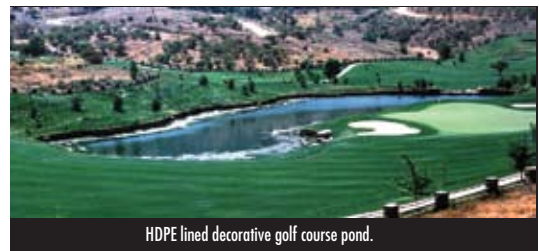
Exposed HDPE lined golf course pond during filling by natural rainwater and surface runoff.

### ECONOMICAL ALTERNATIVE TO CONVENTIONAL SOIL LINERS

Up until the mid 1980s, the most common liner was a conventional soil liner, typically clay, varying in thickness and constructed by heavy mobile equipment. Geomembranes provide an alternative lining system to clay liners that is more economical, quicker to install, and will out-perform clay liners that desiccate and crack over time.

### GSE QUALITY HDPE AND LLDPE GEOMEMBRANES

Polyethylene geomembranes are commercially available in a range of resin densities. GSE uses only high quality polyethylene resins specially formulated to exhibit excellent chemical resistance, UV-resistance, strength, durability, and resistance to stress cracking. These properties are critical to containment in golf course pond lining applications. GSE HDPE geomembranes are best suited for high wear,



HDPE lined decorative golf course pond.

exposure to harsh liquid conditions, and exposed applications. GSE LLDPE geomembranes offer higher flexibility to withstand large differential settlement conditions.

GSE HDPE and LLDPE geomembranes are used extensively in pond lining applications due to their proven performance as a cost efficient replacement to conventional clay and concrete lining systems. And compared to other geomembranes, such as flexible PVC, GSE geomembranes contain no plasticizers or fillers that may cause premature geomembrane cracking and reduced service life.

GSE geomembranes are:

- Rugged and durable
- Resistant to harsh liquids
- Certified for potable water containment
- UV-resistant for exposed liner applications
- Flexible for ease of installation



Construction of an HDPE lined golf course irrigation lake.

- Installed quickly when compared to clay and concrete

### **GSE GEOSYNTHETIC CLAY LINERS PROVIDE AN ECONOMICAL ALTERNATIVE TO CONVENTIONAL COMPACTED CLAY LINERS**

For those golf course pond lining applications that require compacted clay liners (CCLs), in addition to geomembranes GSE also offers two types of geosynthetic clay liners (GCLs), GSE BentoLiner fabric encased GCLs and GSE GundSeal geomembrane supported GCLs. GCLs are commonly used to replace conventional compacted clay layers with a thin low permeability sealing layer of sodium bentonite. The GSE BentoLiner GCL is ideally suited as a replacement for thick layers of compacted clay by simply rolling out a fabric encased bentonite layer on flat or sloping areas.

The GSE GundSeal GCL is used as a replacement for a composite liner (geomembrane/clay), replacing both a low permeability clay layer along with an impermeable and chemically resistant geomembrane. Its one product installation saves installation time as well as improves composite liner hydraulic performance.

Whether the choice is GSE BentoLiner or GSE GundSeal to provide an economical alternative to a compacted clay golf course pond liner, GSE provides the widest range, most versatile, and highest quality GCLs in the world.



GSE BentoLiner & GSE GundSeal geosynthetic clay liners.

### **SKILLED LINER SYSTEM INSTALLATION**

GSE HDPE and LLDPE geomembranes are installed very rapidly, much quicker than constructing a compacted clay pond liner. GSE provides turn-key installation services through our Installation Services Division. We also have an extensive dealer network of approved GSE installers throughout the world. With GSE Installation you can be assured of a quality and cost-effective geomembrane lining system installation.

### **PREFABRICATED LINING SYSTEMS**

For smaller projects, such as a small decorative pond or waterway, GSE provides prefabricated HDPE or

LLDPE geomembrane panels for the client's own installation. GSE Plastic Fabrications is available to fabricate liners to the specified size and dimensions to custom-fit your pond or canal.

### **COVERED OR EXPOSED POND LINERS**

Geomembrane golf ponds and reservoir liners may be left exposed or may be protected with a cover of soil or concrete. GSE's UV-stabilized geomembranes can remain exposed for an extended period of time with no decline in their level of performance. However, most golf pond liner systems should be protected against damage from rocks, metal golf shoe spikes, debris, equipment, and vandalism.

### **REPAIR OF EXISTING PONDS AND LAKES**

GSE geomembranes are suitable for lining over existing pond liners, such as weathered soils and concrete. The liners are simply un-rolled over the prepared surface by our skilled installation technicians or approved GSE Installers.

### **ENGINEERING SUPPORT**

The GSE Engineering Support Staff is comprised of multidisciplinary product professionals to support you across a range of project requirements. This includes knowledge in geomembrane, geosynthetic clay liners, geonet, geocomposite, nonwoven geotextile and concrete protection products and application solutions. Rely on our technical staff to help you solve your project issues.

### **CUSTOM FABRICATION**

The GSE Custom Fabrication Group builds products to your exact specifications. We have extensive experience in prefabricated polyethylene products and components. A few examples of our custom fabricated products are Aqua Tanks, Quick Containment, concrete protection liners, boots, sumps, pads, pipes, daily covers, temporary containment, containment boom and other products to fulfill your fabrication needs.

### **INSTALLER NETWORK**

The GSE Installer Network leads the industry with the most experienced, large, and flexible crews available around the world to meet your installation requirements. Each installer is equipped with state-of-the-art welding and testing equipment to ensure a successful installation. Selecting a qualified installer with the right product knowledge is critical to your success. Let GSE connect you to the right installer to handle your installation project of any size from start to finish.