

Tri-Planar Geonet to Replace Gravel Drain in Gypsum Stacking Lining System

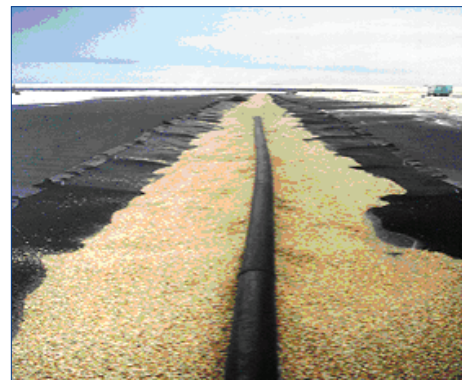
PROJECT NAME: Drainage for Gypsum Stacking Liner

LOCATION: Louisiana

PRODUCTS: Tri-Planar Geonet Composite

DATE: July 2001

ENGINEER: Ardaman & Associates



The current state of practice for lateral drainage layer in gypsum stacking lining systems is 1.5 feet of gravel wrapped within a 10 oz/sy geotextile. Gravel drainage layer is expensive considering material cost, transportation, and

installation. Geonet drain alternative can save cost, air space, especially when conforming gravel material is not readily available. To evaluate the feasibility of replacing 1.5-feet of gravel with tri-planar geonet as drainage medium in gypsum stacking lining systems,



a testing section is proposed in a nitrogen fertilizer company located in Louisiana. A cross-section of the geonet drain alternative is attached. Due to high normal stresses and high flow rate requirement, tri-planar geonet is used in this test section in the area of 12.5' * 500'. This geonet drain alternative is compared, in terms of measured flow rate, side by side, with a standard design section.

The high flow geonet is deployed atop the geotextile with its primary flow direction perpendicular to the centerline of the slotted pipe. Silica gravel is then placed in the drain to form the bedding on which the slotted HDPE pipe invert rests. Cares are exercised during placement so as not to damage or displace the geonet. The slotted HDPE pipe is then installed atop the gravel bedding; silica gravel is then placed on both sides of the pipe. Placement of the silica gravel is controlled such that the gravel completely surrounds the pipe. After placing the tri-planar geonet, gravel, and the geotextile is wrapped all around the sides and top of the geonet, gravel. Gypsum backfill above the drain is then placed over the geotextile in one lift and compacted lightly.

Initial flow monitoring indicates favorably with the tri-planar geonet alternative. This test section will be monitored for seven years. Further investigation with field pore pressure measurement over the liner system will be conducted to verify the reduction in seepage pressure due to the presence of the geonet drain system and the effectiveness of the alternative design.