

## BENTOMAT® DN SUPERGROOVE SEAM TEST DATA

Pursuant to the methods introduced in TR-327, testing of the effectiveness of the SuperGroove™ has been completed for Bentomat DN. The data, summarized in Table 1 below and represented graphically on the following page, indicates that the Supergroove effectively self-seals the overlapped seams of Bentomat DN with no preferential flow.

Table 1. Comparative performance of Bentomat DN with traditional bentonite-enhanced seam and with new SuperGroove.

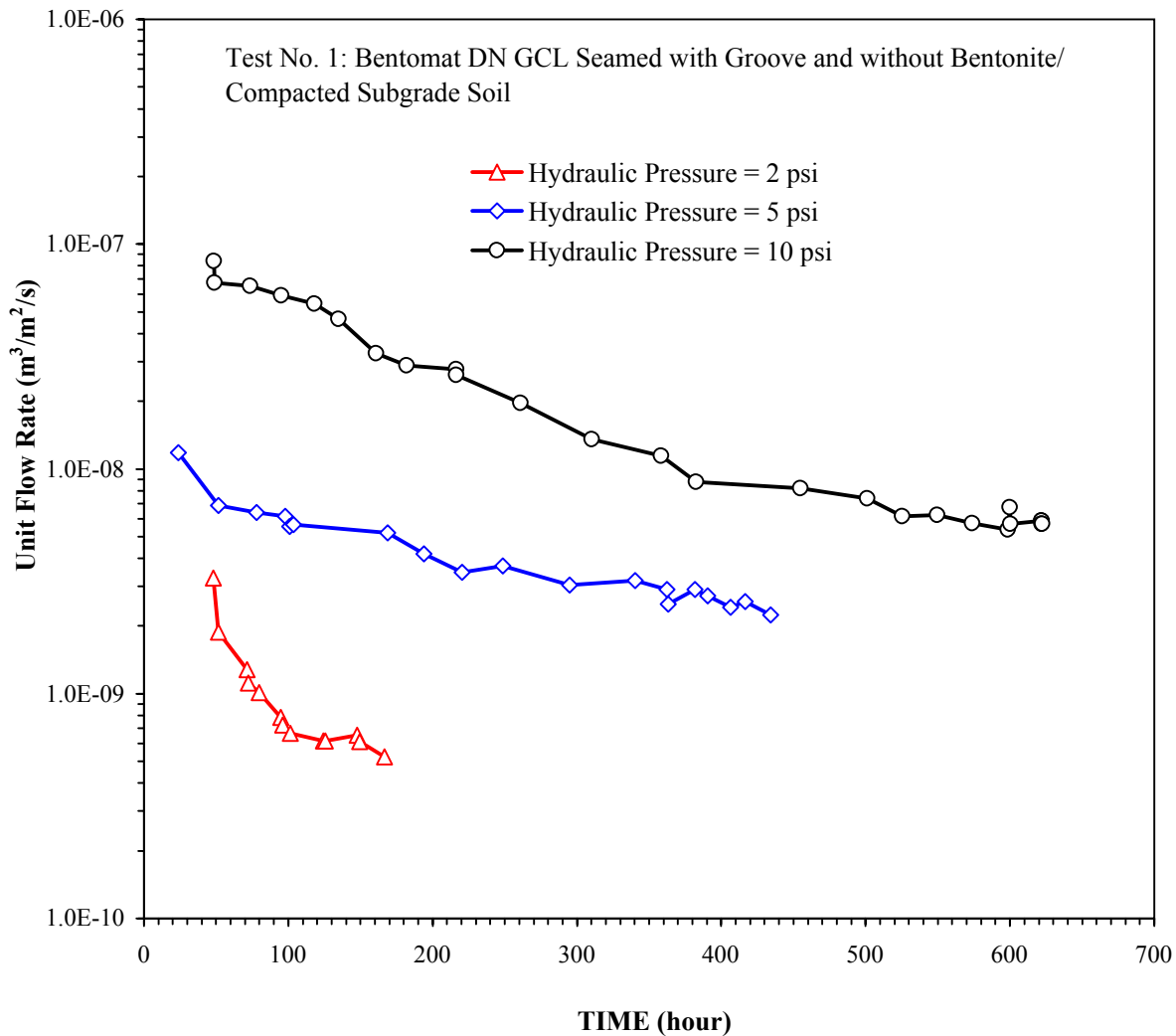
Hydraulic Pressure (psi)	Unseamed Flow (m <sup>3</sup> /m <sup>2</sup> /s)	Seamed Flow (m <sup>3</sup> /m <sup>2</sup> /s)	Flow difference (m <sup>3</sup> /m <sup>2</sup> /s)	Seam correction factor*	Seam flow (m <sup>3</sup> /m <sup>2</sup> /s)**
2	4.4 x 10 <sup>-10</sup>	5.24 x 10 <sup>-10</sup>	8.4 x 10 <sup>-11</sup>	3.4207	2.45 x 10 <sup>-11</sup>
5	1.37 x 10 <sup>-9</sup>	2.25 x 10 <sup>-9</sup>	8.8 x 10 <sup>-10</sup>	3.4207	2.57 x 10 <sup>-10</sup>
10	3.4 x 10 <sup>-9</sup>	5.70 x 10 <sup>-9</sup>	2.29 x 10 <sup>-9</sup>	3.4207	6.69 x 10 <sup>-10</sup>

\*Laboratory tests are performed with 3.4207 times more seam length (per unit area of GCL) than in field seams.

\*\*Flow difference divided by seam correction factor results in estimated preferential flow per unit area through field seam.

The data shows that the seam flow is actually less than the baseline unseamed flow and thus does not represent a preferential flow pathway for leakage. Please refer to TR-327 for additional discussion of the testing and its interpretation.

**COLLOID ENVIRONMENTAL TECHNOLOGIES COMPANY**  
**LARGE-SCALE FLOW RATE TESTING**  
**BENTOMAT DN GCL SEAMED WITH GROOVE AND WITHOUT BENTONITE**



Test No.	Diameter of Test Specimen (in.)	Total Normal Stress <sup>(1)</sup> (psf)	Hydraulic Pressure (psi)	Equivalent Hydraulic Head (ft)	Test Duration (hours)	Flow Rate at Completion of Testing ( $\text{m}^3/\text{m}^2/\text{s}$ )
1	23.5	132	2.0	4.6	167	5.24E-10
2	23.5	132	5.0	11.5	434	2.25E-09
3	23.5	191	10.0	23.1	622	5.70E-09

NOTES:

(1) total normal stress = surcharge load (steel plates and sand layer) above the seamed GCL specimen divided by the entire test specimen area.

DATE TESTED: 18 April to 22 July 2002



**SGI TESTING SERVICES, LLC**

FIGURE NO.	A-2
PROJECT NO.	SGI1029
DOCUMENT NO.	SGI02054
FILE NO.	