



Florida Department of Environmental Protection

Bob Martinez Center
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Rick Scott
Governor

Carlos Lopez-Cantera
Lt. Governor

Jonathan P. Steversson
Secretary

VIA ELECTRONIC MAIL

Michael Rublaitus michael.rublaitus@cetco.com

Mr. Michael Rublaitus
CETCO
2870 Forbs Avenue
Hoffman Estates, IL 60192

Subject: Approval of the CETCO
Geosynthetic Clay Liners, Bentomat and Claymax Systems
File No. EQ-852

Dear Mr. Michael Rublaitus:

The Office of District and Business Support has concluded its review of the Equipment Approval request dated July 29, 2015, that was submitted by CETCO for its Geosynthetic Clay Liners (GCL), Bentomat and Claymax Systems, pursuant to Rules 62-762.501(1)(e)2., and 62-762.851(2), Florida Administrative Code (F.A.C.). The CETCO Geosynthetic Clay Liners, Bentomat and Claymax Systems meet the impervious material requirements for aboveground storage tanks. The applicant requests that condition (e) that bans installation beneath an aboveground storage tank be removed from Final Order EQ-287 that was approved on July 8, 1997.

Based on the information provided by CETCO, the Geosynthetic Clay Liners, Bentomat and Claymax Systems provides environmental protection that is equivalent to that provided by compliance with the requirements established in Rule 62-762.501(1)(e)2., F.A.C. The CETCO Geosynthetic Clay Liners, Bentomat and Claymax Systems may be used as an impervious liner for aboveground storage tank secondary containment systems in accordance with the requirements of Chapter 62-762, F.A.C.

Pursuant to Rule 62-762.851(2), F.A.C., the request for the use of the CETCO Geosynthetic Clay Liners, Bentomat and Claymax Systems are approved in the State of Florida as a synthetic liner in the State of Florida provided the following conditions are met:

- (a) A minimum of three random samples of the GCL shall be selected from the differing rolls as test specimens.
- (b) The test specimen shall be hydrated with groundwater from the site. The test specimens shall be hydrated in a laboratory for a minimum of 48 hours before testing.
- (c) After hydration of the test specimen, the specimen shall be tested for permeability using test method ASTM D-5084 as modified for GCL.
- (d) The result from each test shall be submitted to the District Office within 14 days of receipt along with a report demonstrating that no significant degradation of GCL has occurred as a result of this procedure.
- (e) The cover material shall be an inert material.
- (f) The GCL shall not be used in areas of the state that are subjected to high salinity or within 100 feet of a saltwater body.

(g) The GCL shall be hydrated at all times.

Please be advised that the above referenced DEP rules are subject to change. If the above rule standards are modified in the future, this order may be modified or rescinded for future upgrades and installations. Additionally, if the product(s) show a consistent pattern of failure(s), and therefore does not provide substantially equivalent environmental protection, the Department may rescind this order.

The Department's Order shall become final unless a timely petition for an administrative hearing is filed under sections 120.569 and 120.57, F.S., within **21** days of receipt of this Order. Persons who have filed such a petition may seek to mediate the dispute and choosing mediation will not adversely affect the right to a hearing if mediation does not result in a settlement. The procedures for petitioning a hearing and pursuing mediation are set forth below.

Persons affected by this Order have the following options:

- A. If you choose to accept the Department's decision regarding the Order, you do not have to do anything. This Order is final and effective as of the date it is clerked and filed (see page 4).
- B. If you choose to challenge the decision, you may do the following:
 - 1. File a request for an extension of time to file a petition for hearing with the Department's Agency Clerk in the Office of General Counsel within **21** days of receipt of this Order. This request should be made if you wish to meet with the Department in an attempt to resolve any disputes without first filing a petition for hearing or negotiate an agreement to mediate; or
 - 2. File a petition for administrative hearing with the Department's Agency Clerk in the Office of General Counsel within **21** days of receipt of this Order.

In addition to requesting an administrative hearing, any petitioner may elect to pursue mediation under Section 120.573, F.S., and must negotiate an agreement to mediate within **10** days after the deadline for filing a petition.

How to Request an Extension of Time to File a Petition for Hearing

For good cause shown, pursuant to Rule 62-110.106(4), F.A.C., the Department may grant a request for an extension of time to file a petition for hearing. Such a request must be filed (received) by the Agency Clerk in the Office of General Counsel of the Department at 3900 Commonwealth Boulevard, Mail Station 35, Tallahassee, Florida, 32399-3000, within **21** days of receipt of this Order. Petitioner, if different from the applicant, shall mail a copy of the request to the applicant at the time of filing. Failure to file a petition within this time period shall waive the right of anyone who may request an administrative hearing under Sections 120.569 and 120.57, F.S.

How to File a Petition for Administrative Hearing

A person whose substantial interests are affected by this Order may petition for an administrative proceeding (hearing) under Sections 120.569 and 120.57, F.S. The petition must contain the information set forth below and must be filed (received) by the Agency Clerk in the Office of General Counsel of the Department at 3900 Commonwealth Boulevard, MS 35, Tallahassee, Florida, 32399-3000, within **21** days of receipt of this Order. Petitioner, if different from the applicant shall mail a copy of the petition to the applicant at the time of filing. Failure to file a petition within this time period shall waive the right of anyone who may request an administrative hearing under Sections 120.569 and 120.57, F.S. Pursuant to Subsection 120.569(2), F.S., and Rule 28-106.201, F.A.C., a petition for administrative hearing shall contain the following information.

- a) The name, address, and telephone number of each petitioner; the name, address, and telephone number of the petitioner's representative, if any, the site owner's name and address, if different from the petitioner, the DEP facility number, and the name and address of the facility;
- b) A statement of when and how the petitioner received notice of the Department's action or proposed action;
- c) An explanation of how each petitioner's substantial interests are or will be affected by the Department's action or proposed action;
- d) A statement of the disputed issues of material fact, or a statement that there are no disputed facts;
- e) A concise statement of the ultimate facts alleged, including a statement of the specific facts the petitioner contends warrant reversal or modification of the Department's action or proposed action;
- f) A statement of the specific rules or statutes the petitioner contends requires reversal or modification of the Department's action or proposed action; and
- g) A statement of the relief sought by the petitioner, stating precisely the action petitioner wishes the Department to take with respect to the Department's action or proposed action.

How to Pursue Mediation

In addition to requesting an administrative hearing, any petitioner may elect to pursue mediation. The election may be accomplished by filing with the Department a mediation agreement with all parties to the proceeding (i.e., the applicant, the Department, and any person who has filed a timely and sufficient petition for hearing). The agreement must contain all the information required by Rule 28-106.404, F.A.C. The agreement, signed by all parties, must be received by the Agency Clerk in the Office of General Counsel of the Department at 3900 Commonwealth Boulevard, Mail Station 35, Tallahassee, Florida, 32399-3000 within **10** days after the deadline for filing a petition, as set forth above. Choosing mediation will not adversely affect the right to a hearing if mediation does not result in a settlement.

Pursuant to Rule 28-106.404, F.A.C., an agreement to mediate must include the following.

- (i) The name, address, and telephone number of the persons who may attend the mediation, (also the DEP facility number, the name and address of the facility if applicable);
- (ii) The name, address, and telephone number of the mediator agreed to by the parties;
- (iii) How the costs and fees associated with the mediation will be allocated (the Department will not pay any of the costs of mediation);
- (iv) The agreement of the parties regarding the confidentiality of discussions and documents introduced during mediation to the extent authorized by law;
- (v) The date, time, and place of the first mediation session;
- (vi) The name of the party's representative who shall have authority to settle or recommend settlement; and
- (vii) The signature of the parties.

As provided in Section 120.573, F.S., the timely agreement of all parties to mediate will toll the time limitations imposed by Sections 120.569 and 120.57, F.S., for holding an administrative hearing and issuing a final order. Unless otherwise agreed by the parties, the mediation must be concluded within sixty days of the execution of the agreement. If mediation results in settlement of the administrative dispute, the Department must enter a final order incorporating the agreement of the parties. Persons seeking to protect their substantial interests that would be affected by such a modified final decision must file their petitions within **21** days of receipt of this notice, or they shall be deemed to have waived their right to a proceeding under Sections 120.569 and 120.57, F.S. If mediation terminates without settlement of the dispute, the Department shall notify all parties in writing that the administrative hearing processes under Sections 120.569 and 120.57, F.S., are resumed.

This Order is final and effective as of the date it is clerked and filed (see this page). Timely filing a petition for administrative hearing postpones the date this Order takes effect until the Department issues either a final order pursuant to an administrative hearing or mediation settlement.

Judicial Review

Any party to this Order has the right to seek judicial review of it under Section 120.68, F.S., by filing a notice of appeal under Rule 9.110 of the Florida Rules of Appellate Procedure with the Agency Clerk of the Department in the Office of General Counsel, Mail Station 35, 3900 Commonwealth Boulevard, Tallahassee, Florida 32399-3000, and by filing a copy of the notice of appeal accompanied by the applicable filing fees with the appropriate district court of appeal. The notice of appeal must be filed within thirty days after this order is filed with the clerk of the Department (see below).

Questions

Any questions regarding the Department's review of your equipment approval should be directed to John Svec at (850)245-8845. Questions regarding legal issues should be referred to Betsy Hewett, Office of General Counsel, at (850)245-2267. Contact with any of the above does not constitute a petition for administrative hearing, a request for a time extension to file a petition for hearing or an agreement to mediate.

Sincerely,



John A. Coates, PE, Assistant Division Director
Division of Waste Management

JAC/js

FILING AND ACKNOWLEDGMENT FILED,
on this date, pursuant to §120.52 Florida Statutes,
with the designated Department Clerk, receipt of
which is hereby acknowledged.

10/23/2015


X

Judith Pennington

Signed by: Penningto_JA

Clerk
(or Deputy Clerk)

Date

COMPATIBILITY TESTING OF BENTOMAT® (GASOLINE, DIESEL AND JET FUEL)

Three specimens of Bentomat were permeated with water to determine their initial hydraulic conductivity. After being permeated with water for approximately 1 month, the specimens were permeated with gasoline, diesel fuel and jet fuel respectively. The hydraulic conductivity of the Bentomat was then measured with these fluids as permeants.

Test results indicate that Bentomat is compatible with and will provide an effective hydraulic barrier when permeated with gasoline, diesel fuel and jet fuel. The hydraulic conductivity of Bentomat is shown in graphical form for each permeant described above.

Note: Bentomat® SS as shown in the test report was renamed Bentomat ST®. The products are identical.

TR-103 Revised 12/00

North America: 847.851.1800 | 800.527.9948 | www.CETCO.com

© 2014 CETCO. IMPORTANT: The information contained herein supersedes all previous printed versions, and is believed to be accurate and reliable. For the most up-to-date information, please visit www.CETCO.com. CETCO accepts no responsibility for the results obtained through application of this product. CETCO reserves the right to update information without notice.

TR_103_AM_EN_201402_v1



**GEOTECHNICAL LABORATORY TEST RESULTS
COMPATIBILITY TESTING
BENTOMAT SS**

PREPARED FOR:

American Colloid
1500 W. Shure Drive
Arlington Heights, IL 60004

PREPARED BY:

J&L Testing Company, Inc.
938 S. Central Avenue
Canonsburg, PA 15317

ENGINEER ROBERT TROGER
DATE ASSIGNED _____
DATE DUE _____

JOB NO. 9231260
JOB NAME AMERICAN COLLOID
BENTOMAT SS
COMPATIBILITY TESTING

DATE REC. _____
DATE CMP. _____
REC. BY DAG
PAGE NO. 1 of 1

SUMMARY OF LABORATORY TEST RESULTS

[illegible]

SUMMARY OF COMPATIBILITY TEST RESULTS

Client Name:	CETCO	JOB NO.:	92S1260
Sample Identification:	SAMPLE 1	Prepared By :	DEF
	BENTOMAT "SS"		
Initial Height (in):	0.258		
Initial Diameter (in):	2.800		
Initial Dry Density (pcf):		Gradient :	856.00

Pore Fluid : GASOLINE

E.T. days	DATE	TIME	E.T. min	TOTAL FLOW, cc	K cm/sec
0.0	09/08/92	08:25	0	0.0	--
1.3	09/09/92	16:30	1925	3.6	9.2E-10
3.0	09/11/92	08:10	4305	5.3	6.0E-10
7.3	09/15/92	15:30	10505	17.0	7.9E-10
8.1	09/16/92	10:55	11670	19.0	8.0E-10
10.3	09/18/92	15:20	14815	22.7	7.5E-10
13.1	09/21/92	11:25	18900	30.0	7.8E-10
17.1	09/25/92	11:50	24685	38.3	7.6E-10
22.3	09/30/92	16:20	32155	44.1	6.7E-10
24.1	10/02/92	11:45	34760	47.6	6.7E-10
27.3	10/05/92	15:10	39285	56.7	7.1E-10
28.3	10/06/92	16:05	40780	59.2	7.1E-10
30.2	10/08/92	13:45	43520	64.2	7.2E-10
34.3	10/12/92	16:05	49420	74.6	7.4E-10
37.3	10/15/92	16:05	53740	81.5	7.4E-10
38.3	10/16/92	14:35	55090	83.9	7.5E-10
41.1	10/19/92	11:20	59215	90.4	7.5E-10
43.2	10/21/92	14:15	62270	95.1	7.5E-10
45.3	10/23/92	16:36	65291	99.8	7.5E-10
49.0	10/27/92	09:32	70627	108.6	7.5E-10
55.0	11/02/92	09:30	79265	122.0	7.5E-10
57.3	11/04/92	16:10	82545	127.5	7.6E-10
59.0	11/06/92	08:35	84970	131.4	7.6E-10
63.0	11/10/92	08:23	90718	140.5	7.6E-10
71.3	11/18/92	15:08	102643	155.3	7.4E-10
73.3	11/20/92	16:15	105590	159.6	7.4E-10

GASOLINE
INTRODUCED

SUMMARY OF COMPATIBILITY TEST RESULTS

Client Name: CETCO

JOB NO.: 92S1260

Sample Identification:

SAMPLE 1
BENTOMAT "SS"

Prepared By : DEF

Initial Height (in): 0.258

Initial Diameter (in): 2.800

Initial Dry Density (pcf):

Gradient : 856.00

Pore Fluid : GASOLINE

E.T. days	DATE	TIME	E.T. min	TOTAL FLOW, cc	K cm/sec	
0.0	09/08/92	08:25	0	0.0	--	
1.3	09/09/92	16:30	1925	3.6	9.2E-10	
3.0	09/11/92	08:10	4305	5.3	6.0E-10	
7.3	09/15/92	15:30	10505	17.0	7.9E-10	
8.1	09/16/92	10:55	11670	19.0	8.0E-10	
10.3	09/18/92	15:20	14815	22.7	7.5E-10	
13.1	09/21/92	11:25	18900	30.0	7.8E-10	
17.1	09/25/92	11:50	24685	38.3	7.6E-10	
22.3	09/30/92	16:20	32155	44.1	6.7E-10	
24.1	10/02/92	11:45	34760	47.6	6.7E-10	
27.3	10/05/92	15:10	39285	56.7	7.1E-10	
28.3	10/06/92	16:05	40780	59.2	7.1E-10	
30.2	10/08/92	13:45	43520	64.2	7.2E-10	GASOLINE INTRODUCED
34.3	10/12/92	16:05	49420	74.6	7.4E-10	
37.3	10/15/92	16:05	53740	81.5	7.4E-10	
38.3	10/16/92	14:35	55090	83.9	7.5E-10	
41.1	10/19/92	11:20	59215	90.4	7.5E-10	
43.2	10/21/92	14:15	62270	95.1	7.5E-10	
45.3	10/23/92	16:36	65291	99.8	7.5E-10	
49.0	10/27/92	09:32	70627	108.6	7.5E-10	
55.0	11/02/92	09:30	79265	122.0	7.5E-10	
57.3	11/04/92	16:10	82545	127.5	7.6E-10	
59.0	11/06/92	08:35	84970	131.4	7.6E-10	
63.0	11/10/92	08:23	90718	140.5	7.6E-10	
71.3	11/18/92	15:08	102643	155.3	7.4E-10	
73.3	11/20/92	16:15	105590	159.6	7.4E-10	

SUMMARY OF COMPATIBILITY TEST RESULTS

Client Name: CETCO

JOB NO.: 92S1260

Sample Identification: SAMPLE 2
BENTOMAT "SS"

Prepared By: DEF

Initial Height (in): 0.285

Initial Diameter (in): 2.800

Initial Dry Density (pcf):

Gradient: 775.00

Pore Fluid: DIESEL

E.T. days	DATE	TIME	E.T. min	TOTAL FLOW, cc	K cm/sec
0.0	09/08/92	08:30	0	0.0	--
1.3	09/09/92	16:30	1920	2.0	5.6E-10
3.0	09/11/92	08:10	4300	4.2	5.3E-10
7.3	09/15/92	15:30	10500	9.7	5.0E-10
8.0	09/16/92	08:25	11515	10.6	5.0E-10
10.3	09/18/92	15:20	14810	13.3	4.9E-10
13.1	09/21/92	11:25	18895	16.6	4.8E-10
17.1	09/25/92	11:50	24680	21.1	4.6E-10
22.3	09/30/92	16:20	32150	23.9	4.0E-10
24.1	10/02/92	11:45	34755	26.2	4.1E-10
27.3	10/05/92	15:10	39280	30.2	4.2E-10
28.3	10/06/92	16:00	40770	31.5	4.2E-10
30.2	10/08/92	13:45	43515	33.9	4.2E-10
34.3	10/12/92	16:05	49415	39.0	4.3E-10
37.3	10/15/92	16:00	53730	42.6	4.3E-10
38.3	10/16/92	14:35	55085	43.8	4.3E-10
41.1	10/19/92	11:20	59210	47.3	4.3E-10
43.2	10/21/92	14:10	62260	50.5	4.4E-10
45.3	10/23/92	15:05	65195	53.8	4.5E-10
49.0	10/27/92	09:30	70620	58.8	4.5E-10
55.0	11/02/92	09:30	79260	62.4	4.3E-10
57.3	11/04/92	16:15	82545	64.9	4.3E-10
59.0	11/06/92	08:35	84965	65.1	4.1E-10
63.0	11/10/92	08:23	90713	75.2	4.5E-10
71.3	11/18/92	15:08	102638	80.3	4.2E-10
73.3	11/20/92	16:15	105585	90.7	4.7E-10

DIESEL
INTRODUCED

SUMMARY OF COMPATIBILITY TEST RESULTS

Client Name: CETCO

Sample Identification:

SAMPLE 2

BENTOMAT "SS"

JOB NO.: 92S1260

Prepared By : DEF

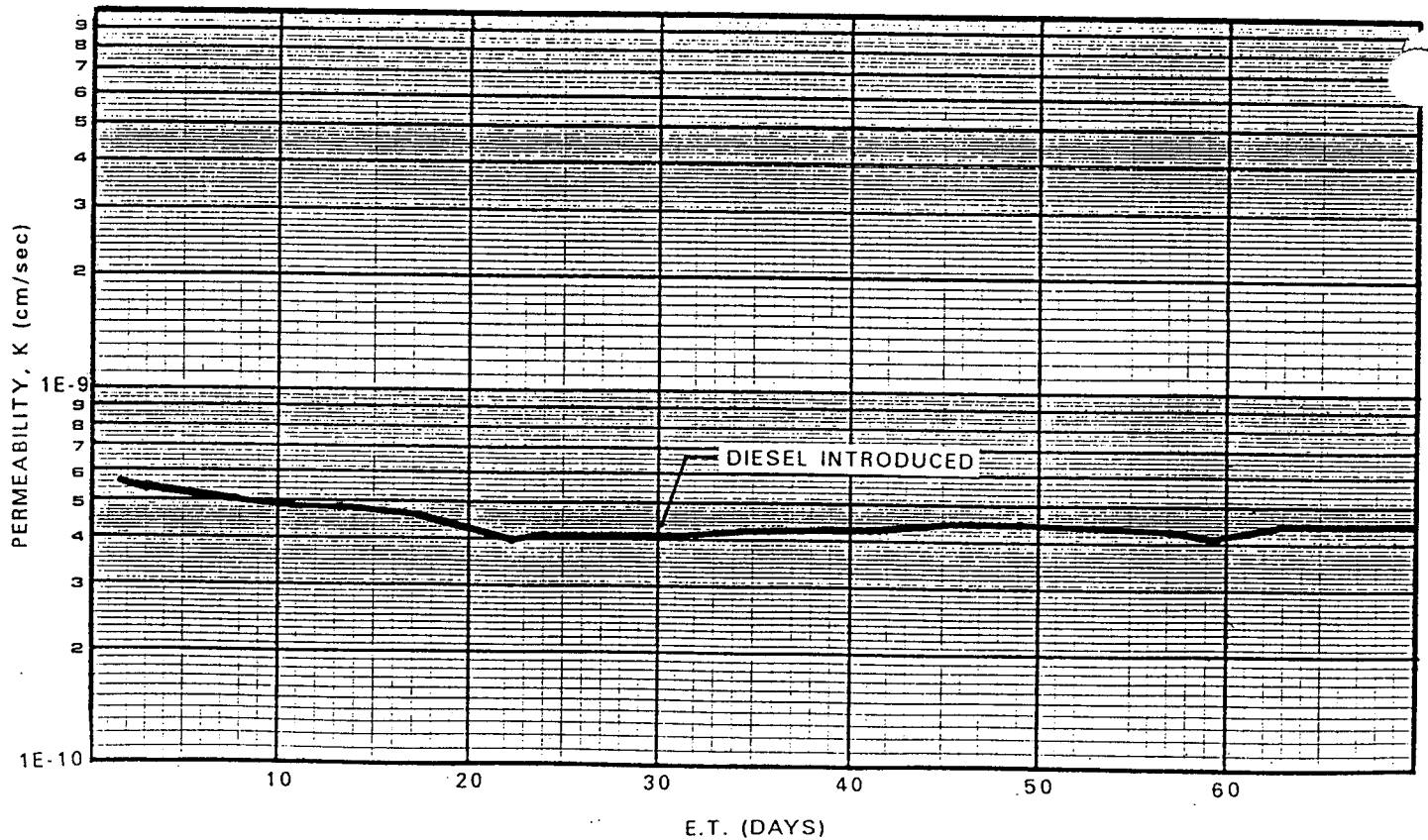
Initial Height (in): 0.285

Initial Diameter (in): 2.800

Initial Dry Density (pcf):

Gradient : 775.00

Pore Fluid : DIESEL



SUMMARY OF COMPATIBILITY TEST RESULTS

Client Name: CETCO
 Sample Identification: SAMPLE 3
 BENTOMAT "SS"
 Initial Height (in): 0.270
 Initial Diameter (in): 2.800
 Initial Dry Density (pcf):

JOB NO.: 92S1260
 Prepared By: DEF

Gradient: 818.00

Pore Fluid: JET FUEL

E.T. days	DATE	TIME	E.T. min	TOTAL FLOW, cc	K cm/sec
0.0	09/08/92	08:32	0	0.0	--
1.3	09/09/92	16:30	1918	19.7	5.3E-09
3.0	09/11/92	08:10	4298	25.3	3.0E-09
7.3	09/15/92	15:30	10498	36.9	1.8E-09
8.0	09/16/92	08:25	11513	38.7	1.7E-09
10.3	09/18/92	15:20	14808	42.5	1.5E-09
13.1	09/21/92	11:25	18893	44.5	1.2E-09
17.1	09/25/92	11:50	24678	55.5	1.2E-09
22.3	09/30/92	16:20	32148	61.2	9.8E-10
24.1	10/02/92	11:45	34753	66.0	9.7E-10
27.3	10/05/92	15:10	39278	74.5	9.7E-10
28.3	10/06/92	16:00	40768	78.2	9.8E-10
30.2	10/08/92	13:45	43513	83.3	9.8E-10
34.3	10/12/92	16:05	49413	94.1	9.8E-10
37.1	10/15/92	11:55	53483	101.7	9.8E-10
38.3	10/16/92	14:35	55083	102.4	9.5E-10
41.1	10/19/92	11:20	59208	109.2	9.5E-10
43.2	10/21/92	14:10	62258	123.2	1.0E-09
45.3	10/23/92	15:05	65193	130.2	1.0E-09
49.0	10/27/92	09:31	70619	150.2	1.1E-09
55.0	11/02/92	09:30	79258	158.6	1.0E-09
57.3	11/04/92	16:10	82538	169.7	1.1E-09
59.0	11/06/92	08:35	84963	175.3	1.1E-09
63.0	11/10/92	08:23	90711	180.0	1.0E-09
71.3	11/18/92	15:08	102636	195.9	9.8E-10
73.3	11/20/92	16:15	105583	205.2	1.0E-09

JET FUEL
INTRODUCED

SUMMARY OF COMPATIBILITY TEST RESULTS

Client Name: CETCO

Sample Identification:

SAMPLE 3

BENTOMAT "SS"

JOB NO.:

92S1260

Prepared By :

DEF

Initial Height (in):

0.270

Initial Diameter (in):

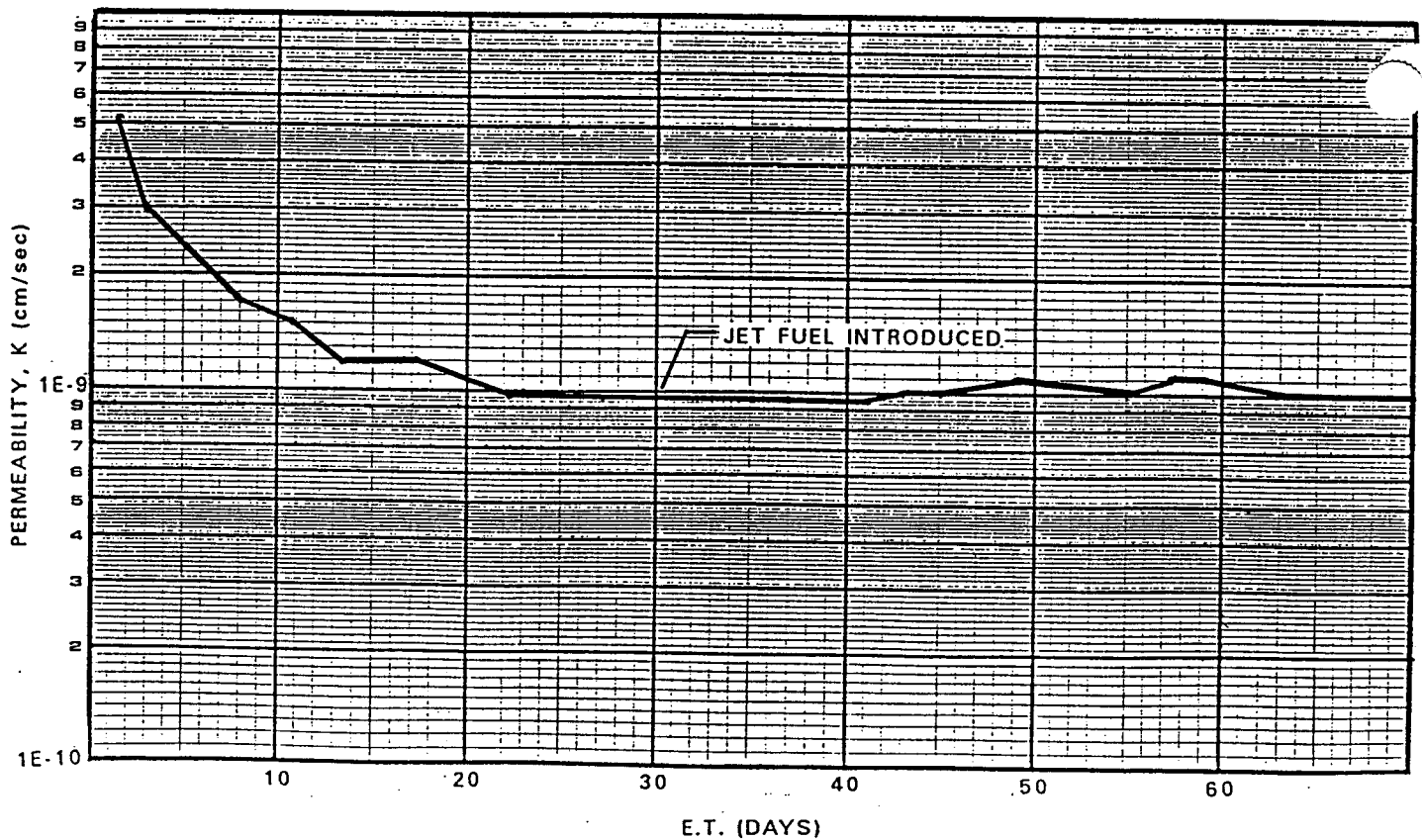
2.800

Initial Dry Density (pcf):

Gradient :

818.00

Pore Fluid : JET FUEL



GCL PERFORMANCE IN A CONCENTRATED CALCIUM SOLUTION **Permeability vs. Confining Stress**

The following test data was developed by Daniel in 2000 and published in the reference listed below. However, unpublished details about the testing, including this graph, were provided to CETCO in separate correspondences from Daniel. The purpose of this summary is to present all the data and information about the test program in one document.

The graph compares the effects of confining stress on the permeability of GCLs permeated with both water and a concentrated calcium chloride (CaCl_2) solution. The graph demonstrates that even when a highly contaminated liquid is permeated through a GCL, it still maintains an acceptable permeability of $\leq 5 \times 10^{-9}$ cm/sec when the confining stress exceeds 40 psi or 275 kPa. Based on this data, Daniel concluded that, “chemical attack is of much less concern for a landfill liner than for a landfill cover.” In other words, the high confining stress environment of a landfill bottom liner protects the GCL from permeability increases observed in low confining stress environments such as landfill final covers.

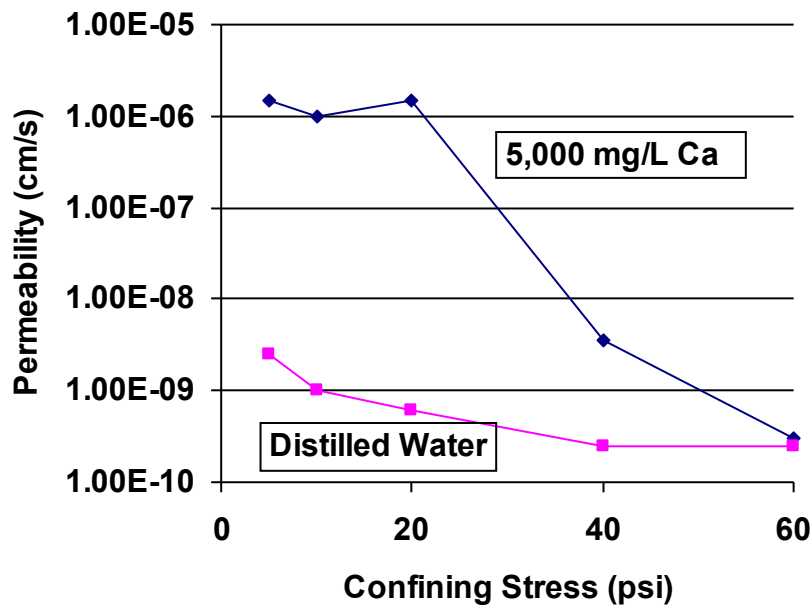
Test specimens were set up in flexible-wall permeameters, subjected to the final confining pressure, and then hydrated and subsequently permeated with either distilled water or a calcium chloride solution. For the calcium chloride tests, both the hydration liquid and the permeation liquid were the same calcium chloride solution. This solution was 13,700 mg/L CaCl_2 , which is equal to 5,000 mg/L Ca^{++} . This liquid is believed to represent worst-case conditions in that the concentration was very high, and no fresh water permeation was allowed as would typically occur in real-world applications when the GCL is placed on a soil subgrade. Specimens were permeated for 10 pore volumes of flow, which was more than enough to achieve full ion exchange and equilibrium conditions.

TR-321 Revised 05/02

North America: 847.851.1800 | 800.527.9948 | www.CETCO.com

© 2014 CETCO. IMPORTANT: The information contained herein supersedes all previous printed versions, and is believed to be accurate and reliable. For the most up-to-date information, please visit www.CETCO.com. CETCO accepts no responsibility for the results obtained through application of this product. CETCO reserves the right to update information without notice.

TR_321_AM_EN_201401_v1



The data shows that the decrease in permeability with increasing confining stress is even more dramatic than when fresh water is used as the permeant. Even in a highly contaminated liquid such as this, however, the GCL still functioned effectively when the confining stress reached approximately 40 psi (275 kPa).

References:

Daniel, D.E. (2000), "Hydraulic Durability of Geosynthetic Clay Liners," *Proceedings of the GRI-14 Conference on 'Hot Topics in Geosynthetics – I'*, R.M. Koerner, Y.G. Hsuan, and M.V. Ashley (Eds.), Gil Publications, Folsom, P.A. , pp. 116-135.

Daniel, D.E., Correspondence to J. Olsta, 19 March 2001 and 22 November 2000.