September 1, 2021

Sent via email

Mr. Michael Regan, EPA Administrator
The United States Environmental Protection Agency
1200 Pennsylvania Avenue, NW
Mail Code 50304-P
Washington DC, 20460

RE: Alternate Liner Demonstration Extension Request Due to Analytical Limitations
DTE Electric Company Belle River Power Plant
Bottom Ash Basins Coal Combustion Residuals Unit
4505 King Road, China Township, Michigan

Dear Administrator Regan:

In accordance with 40 C.F.R. §257.71(d)(2)(ii)(A) the DTE Electric Company (DTE Electric) is submitting this extension request to the U.S. Environmental Protection Agency (EPA) for approval. Specifically, this request is to extend the November 30, 2021, deadline to submit an Alternate Liner Demonstration for the Belle River Power Plant Bottom Ash Basins due to analytical limitations.

The enclosed memorandum prepared by Geosyntec and Excel Geotechnical Testing laboratory provides the information requested by the rule, a date by which termination criteria are anticipated to be achieved, along with a discussion of results, and how the anticipated dates are estimated. The memorandum demonstrates how DTE Electric qualifies for and should be granted the requested extension to submit an Alternate Liner Demonstration after November 30, 2021.

Electronic files were submitted to Richard Huggins, Mary Jackson, Michelle Long, and Jason Mills via email. If you have any questions regarding this submittal, please contact me at 313.235.0153 or christopher.scieszka@dteenergy.com

Sincerely,

Christopher Scieszka
Project Manager, Environmental Management and Safety, DTE Energy

Enclosure

cc: Richard Huggins, Mary Jackson, Michelle Long, and Jason Mills

2100 Commonwealth Avenue, Suite 100
Ann Arbor, Michigan 48105
PH 734.332.8004
FAX 3734.332.8063
www.geosyntec.com

Memorandum

Date:	September 1, 2021
To:	Michael Regan (USEPA)
Copies to:	Richard Huggins, Mary Jackson, Michelle Long, and Jason Mills (USEPA), Christopher Scieszka (DTE Electric Company), John Seymour (Geosyntec Consultants)
From:	Omer Bozok, P.E. (Geosyntec Consultants), Nader Rad, P.E. (Excel Geotechnical Testing)
Subject:	Extension Request for Belle River Power Plant Bottom Ash Basins Alternative Liner Demonstration Geosyntec Project: GLP8017

This technical memorandum has been prepared to request an extension of the deadline to submit the Alternative Liner Demonstration (ALD) for the Belle River Power Plant Bottom Ash Basins (BABs) in accordance with 40 CFR Part 257 as amended on November 20, 2020 (CCR Rule). Specifically, this request is being made in accordance with 40 CFR Part 257.71(d)(2)(ii)(A) *Extension due to analytical limitations.* This memorandum provides the basis and information required by the CCR Rule for the extension request and serves as the written certification from the lab.

BACKGROUND

DTE Electric Company (DTE) submitted the BABs ALD application to the United States Environmental Protection Agency (USEPA) on November 30, 2020, in accordance with the CCR Rule. USEPA has not commented on the ALD application.

DTE took a proactive approach and initiated the field and laboratory investigation to support the ALD in December 2020. The field investigation was completed in December 2020. The laboratory study is still underway and expected to last for the foreseeable future until the requirements of the CCR Rule are met, as demonstrated in this extension request.

The CCR Rule requires that representative samples from the site are tested for hydraulic conductivity with site-specific contact water and that the tests last until chemical equilibrium is reached. If chemical equilibrium is not reached within a reasonable time to complete the ALD, it is considered an "analytical limitation" and the CCR Rule gives the ALD applicant the right to request an extension.

The CCR Rule [§257.71(d)(2)(ii)(A)] states:

"*Extension due to analytical limitations. If the owner or operator cannot meet the demonstration deadline due to analytical limitations related to the measurement of hydraulic conductivity, the owner or operator must submit a request for an extension no later than September 1, 2021, that includes a summary of the data that have been analyzed to date for the samples responsible for the delay and an alternate timeline for completion that has been certified by the laboratory. The extension request must include all of the following:*

(1) A timeline of fieldwork to confirm that samples were collected expeditiously;

(2) A chain of custody documenting when samples were sent to the laboratory;

(3) Written certification from the lab identifying how long it is projected for the tests to reach the relevant termination criteria related to solution chemistry, and

(4) Documentation of the progression towards all test termination metrics to date."

The remainder of this memorandum provides the information necessary to address the CCR Rule extension requirements. The following are provided:

- Field and laboratory investigation timeline and chain of custody;
- Termination criteria used for hydraulic conductivity testing;
- Summary of test results as of August 20, 2021, and projected timeline for reaching termination criteria; and
- Laboratory certification.

FIELD AND LABORATORY INVESTIGATION TIMELINE

DTE Electric Company retained Geosyntec to develop and implement a detailed field and laboratory investigation plan soon after the ALD application was submitted to USEPA. The field investigation portion of the study started on December 8, 2020, (only eight days after the ALD

application was submitted to the USEPA) and it was completed on December 15, 2020. Soil samples collected during the field investigation were sent to Excel Geotechnical Testing (EGT) on December 17, 2020. Samples were registered by EGT on December 8, 2020. The chain of custody (proof of shipping and delivery) is provided in Appendix A. Sample identification was provided to EGT at the time of shipment. Testing details for each sample were provided to EGT after Geosyntec reviewed the field investigation results in more detail. The testing program is provided in Appendix B.

TERMINATION CRITERIA FOR HYDRAULIC CONDUCTIVITY TESTING

Hydraulic conductivity testing is being conducted in general accordance with ASTM D7100 - Standard Test Method for Hydraulic Conductivity Compatibility Testing of Soils with Aqueous Solutions, using site-specific contact water. The use of ASTM D7100 is discussed in the preamble of the CCR Rule and deemed appropriate by USEPA.

ASTM D7100 termination criteria require the following conditions:

- The ratio of outflow to inflow is between 0.75 and 1.25. The hydraulic conductivity is considered steady if four or more consecutive hydraulic conductivity determinations fall within ±25 % or better of the mean value for hydraulic conductivity, $k \geq 3 \times 10\text{-}8$ cm/s or within ±50 % or better for $k < 1 \times 10\text{-}8$ cm/s, and a plot or tabulation of the hydraulic conductivity versus time shows no significant upward or downward trend;
- At least 2 pore volumes (PV) of flow has passed through the sample; and
- pH and electrical conductivity of effluent are within 10 % of that for the influent with no significant increasing or decreasing trends.

TEST RESULTS & PROJECTED TIMELINE FOR TERMINATION CRITERIA

Preliminary results are provided in **Appendix A** as of August 20, 2021, and summarized in **Table 1**. The table provides sample ID, the start date for testing, amount of flow passed through a sample for a given duration of time, hydraulic conductivity values, and projected date for completing 2 PV of flow.

In addition, a set of figures created for each sample provide insight into the progression of:

- PV of flow with time;
- hydraulic conductivity with time;
- hydraulic conductivity with PV;

- pH of inflow and outflow with time; and
- Electrical conductivity (EC) with time.

Overall, the hydraulic conductivity, *k* value of samples range between 8.2E-09 and 2.8E-08 (cm/s). The amount of PV of flow that has passed through the samples ranges from 0.82 to 2.28. As of August 20, 2021, two of the samples have reached the 2 PV criteria. The remaining samples are projected to reach 2 PV between the approximate dates of August 30, 2021, and March 23, 2022; this is based on linear extrapolation between the PV that has passed through the sample at known dates and assumes *k* stays essentially constant, which is the current case.

Table 2 provides figure numbers for quick access to the various plots listed above.

Overall, the PV of flow is progressing steadily towards the 2 PV criterion. Hydraulic conductivity values are generally flat and can be considered steady. pH values are provided in **Table 3.** In general, the average pH of inflow ranges from 8.2 to 8.4, and the average pH of outflow ranges from 8.1 to 8.4. The pH of outflow is within 10 percent of inflow.

EC values are provided in **Table 4.** In general, the average EC of inflow ranges from 609 to 680, and the average EC of outflow ranges from 778 to 2146. The EC values of outflow are not within the 10 percent of inflow. Consequently, a request for an extension is being made. Approximate dates for the EC termination criterion have been estimated based on linear interpolation of inflow and outflow data and summarized in **Table 4**. These dates range from September 1, 2021, and December 23, 2021.

Table 5 summarizes if the sample has reached the termination criterion for PV, pH, EC, and the approximate projected date for reaching the termination criteria. As summarized in the table, samples have not reached all the termination criteria; pH has received termination criterion, and two of the samples have reached the PV criterion; none of the samples have reached the EC criterion. Based on available data, Geosyntec and EGT expect the last sample to reach termination criteria by the end of March 23, 2022. Note that results do not include inflow vs outflow data. The main reason is that the project team had decided to keep the inflow constant, which provides a more stable hydraulic gradient across the sample, more accurate estimation of *k*, faster testing, and more control in the testing procedure. It is our opinion that the inflow/ outflow criterion would be reached by the time other criteria are reached.

CONCLUSION

Considering the data presented above, we are requesting an extension until March 23, 2022.

LABORATORY CERTIFICATION

The hydraulic conductivity compatibility testing for the Belle River Power Plant Bottom Ash Basins samples is projected to last through March 23, 2022, to meet termination criteria, based on results as of August 20, 2021. If the extension is granted, DTE will submit the completed demonstration within 45 days of March 23, 2022, in accordance with §257.71(d)(2)(ii)(B).

Nader S. Rad

Nader Rad, PhD., P.E. (LA)
President, Excel Geotechnical Testing

TABLES

Table 1. Hydraulic Conductivity Summary

ID	Date	Days After Injection	Hydraulic Conductivity (cm/s)	Pore Volumes Passed After Injection	Days to Target Pore Volume	Date of Target PV Reached
B1-ST-1 (7-9')	March 22, 2021	7	9.3E-09	0.04340		
	August 20, 2021	151	8.2E-09	0.82670	216	March 23, 2022
B2-ST-1 (1-3')	March 15, 2021	0	1.8E-08	0.00000		
	August 20, 2021	151	1.2E-08	1.50420	50	October 8, 2021
B2-ST-4 (47-49')	March 15, 2021	0	2.4E-08	0.00000		
	August 20, 2021	151	2.2E-08	1.86780	11	August 30, 2021
B3-ST-5 (77-79')	March 15, 2021	0	2.2E-08	0.00000		
	August 20, 2021	151	1.9E-08	2.23830	Complete	August 6, 2021
B4-ST-3 (47-49')	March 15, 2021	0	2.7E-08	0.00000		
	August 20, 2021	151	2.8E-08	2.28070	Complete	August 3, 2021
B5-ST-5 (87-89')	March 15, 2021	0	1.7E-08	0.00000		
	August 20, 2021	151	1.5E-08	1.86670	11	August 30, 2021

Table 2: Summary of Figures for Various Plots

ID	PV of flow with time	Hydraulic conductivity with time	Hydraulic conductivity with PV	pH of inflow and outflow with time	Electrical conductivity (EC) with time
B1-ST-1 (7-9')	Figure 1	Figure 2	Figure 3	Figure 4	Figure 5
B2-ST-1 (1-3')	Figure 6	Figure 7	Figure 8	Figure 9	Figure 10
B2-ST-4 (47-49')	Figure 11	Figure 12	Figure 13	Figure 14	Figure 15
B3-ST-5 (77-79')	Figure 16	Figure 17	Figure 18	Figure 19	Figure 20
B4-ST-3 (47-49')	Figure 21	Figure 22	Figure 23	Figure 24	Figure 25
B5-ST-5 (87-89')	Figure 26	Figure 27	Figure 28	Figure 29	Figure 30

Table 3: Summary of pH Results

Sample ID	Parameter	pH Inflow	pH Outflow	Is pH of outflow within termination boundaries?
B1-ST-1 (7-9')	Min	8.2	8.1	Yes
	Max	8.6	8.6	
	Average	8.4	8.4	
B2-ST-1 (1-3')	Min	8.0	7.9	Yes
	Max	8.8	8.5	
	Average	8.4	8.2	
B2-ST-4 (47-49')	Min	8.0	8.0	Yes
	Max	8.6	8.4	
	Average	8.3	8.2	
B3-ST-5 (77-79')	Min	8.1	7.8	Yes
	Max	8.8	8.6	
	Average	8.3	8.1	
B4-ST-3 (47-49')	Min	7.7	7.8	Yes
	Max	8.7	8.7	
	Average	8.2	8.1	
B5-ST-5 (87-89')	Min	7.9	8.0	Yes
	Max	8.6	8.5	
	Average	8.4	8.2	

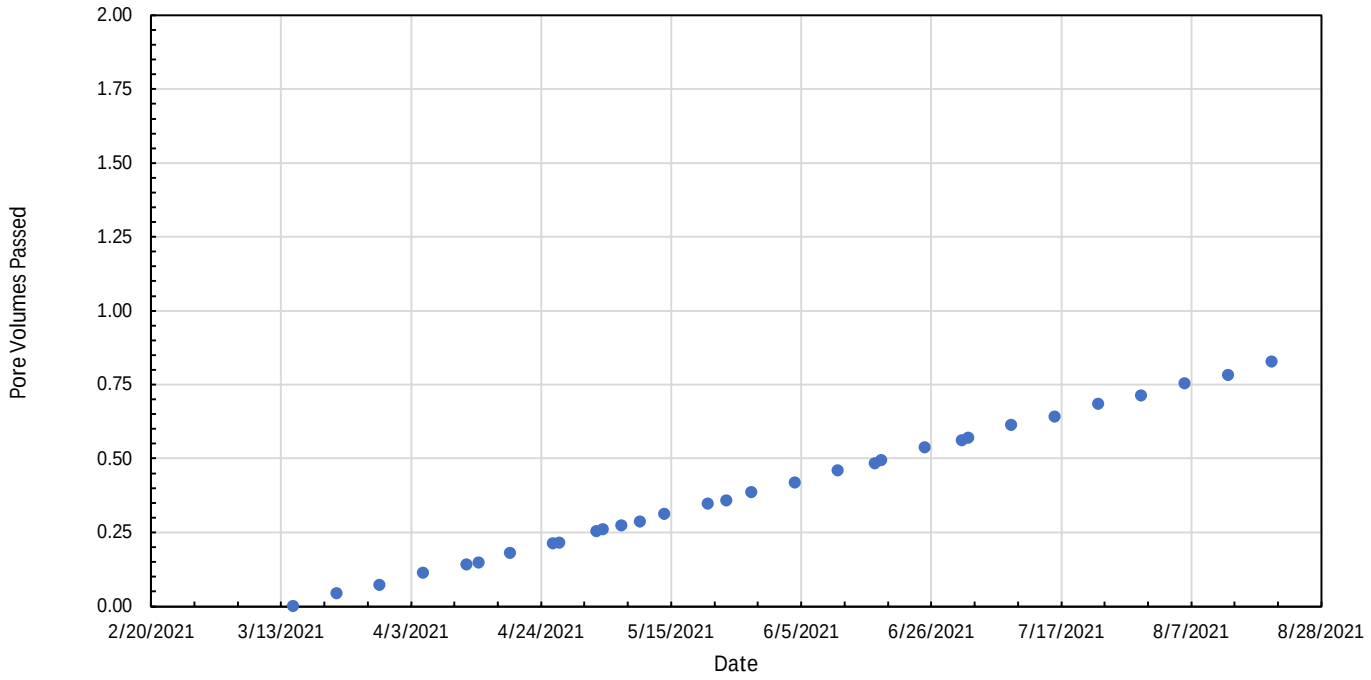
Table 4. Electrical Conductivity Results

Sample ID	Parameter	EC Inflow (µs/cm)	EC Outflow (µs/cm)	Is EC of outflow within termination boundaries?	Approximate Projected Termination Date
B1-ST-1 (7-9')	Min	656	1230	No	November 12, 2021
	Max	660	1614		
	Average	657	1418		
B2-ST-1 (1-3')	Min	560	1764	No	December 23, 2021
	Max	782	3050		
	Average	645	2146		
B2-ST-4 (47-49')	Min	523	933	No	October 12, 2021
	Max	666	1313		
	Average	609	1087		
B3-ST-5 (77-79')	Min	611	816	No	September 12, 2021
	Max	735	1118		
	Average	680	946		
B4-ST-3 (47-49')	Min	518	597	No	September 1, 2021
	Max	730	930		
	Average	625	778		
B5-ST-5 (87-89')	Min	598	1040	No	September 5, 2021
	Max	760	2010		
	Average	678	1341		

Table 5. Summary of Termination Criteria

	Termination Criterion Reached				
Sample ID	Pore Volumes Passed, PV	pH	Electrical Conductivity, EC	Approximate Projected Termination Date	Date Based On
B1-ST-1 (7-9')	No	Yes	No	March 23, 2022	PV
B2-ST-1 (1-3')	No	Yes	No	December 23, 2021	EC
B2-ST-4 (47-49')	No	Yes	No	October 12, 2021	EC
B3-ST-5 (77-79')	Yes	Yes	No	September 12, 2021	EC
B4-ST-3 (47-49')	Yes	Yes	No	September 1, 2021	EC
B5-ST-5 (87-89')	No	Yes	No	September 5, 2021	EC

FIGURES



B1-ST-1 (7-9') PV of Flow with Time

BELLE RIVER POWER PLANT
EAST CHINA TOWNSHIP, MICHIGAN

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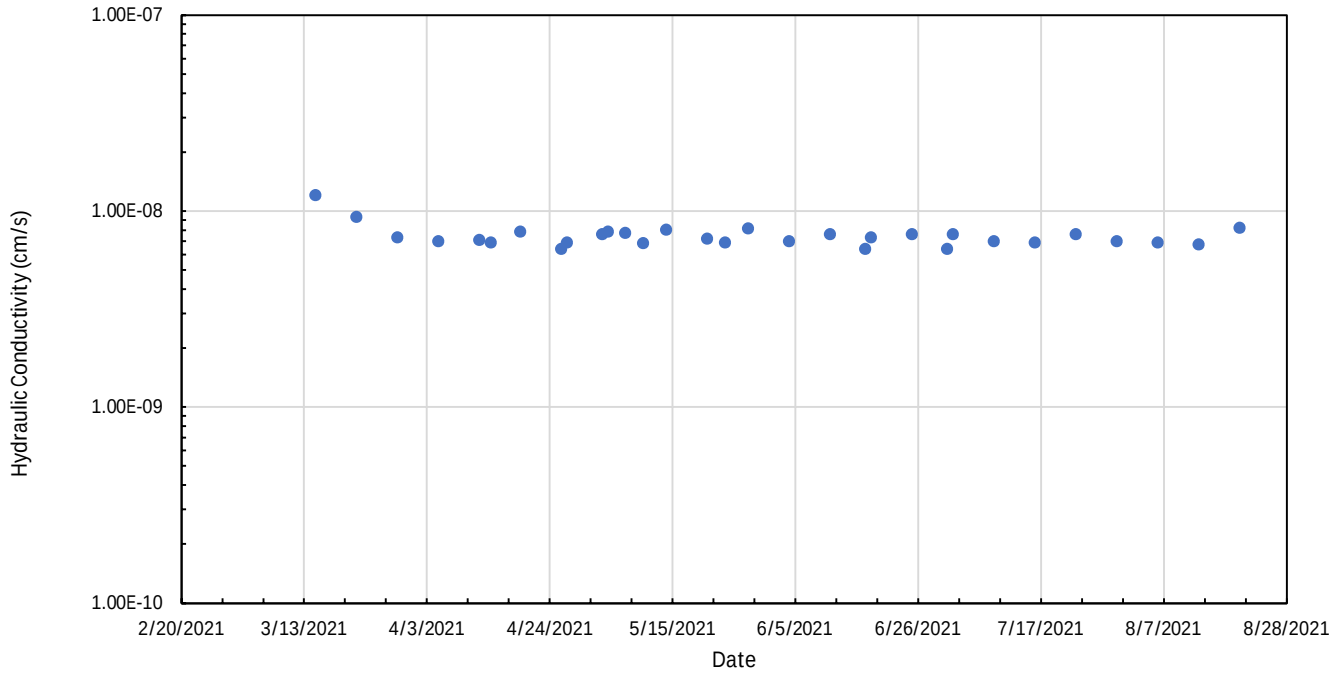
Figure 1



B1-ST-1 (7-9') Hydraulic Conductivity with Time

BELLE RIVER POWER PLANT
EAST CHINA TOWNSHIP, MICHIGAN

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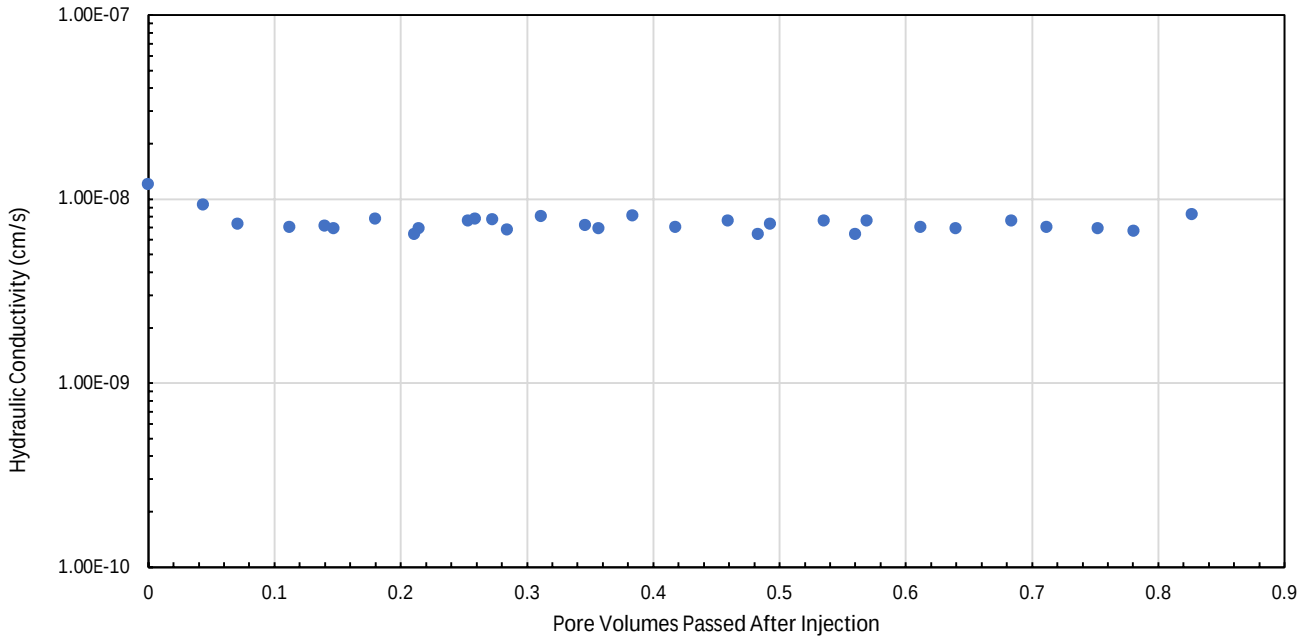
Figure 2



B1-ST-1 (7-9') Hydraulic Conductivity with PV

BELLE RIVER POWER PLANT
EAST CHINA TOWNSHIP, MICHIGAN

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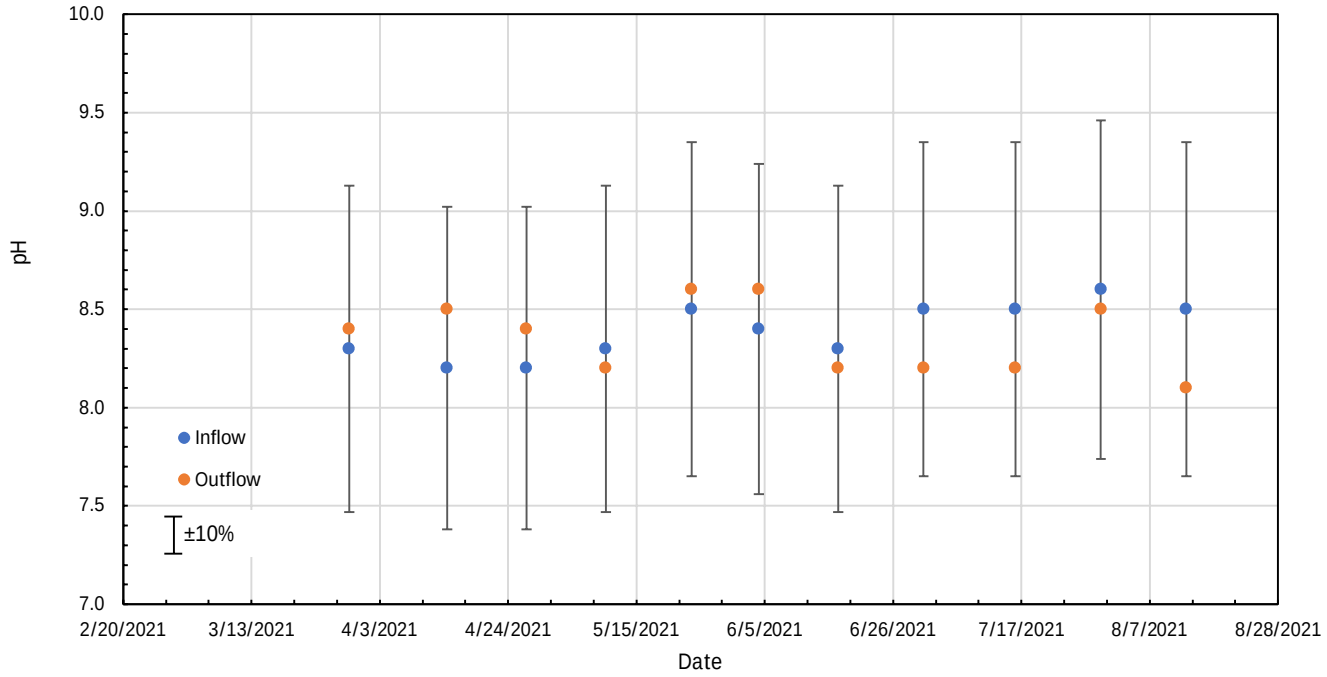
Figure 3



B1-ST-1 (7-9') pH of Inflow and Outflow with Time

BELLE RIVER POWER PLANT
EAST CHINA TOWNSHIP, MICHIGAN

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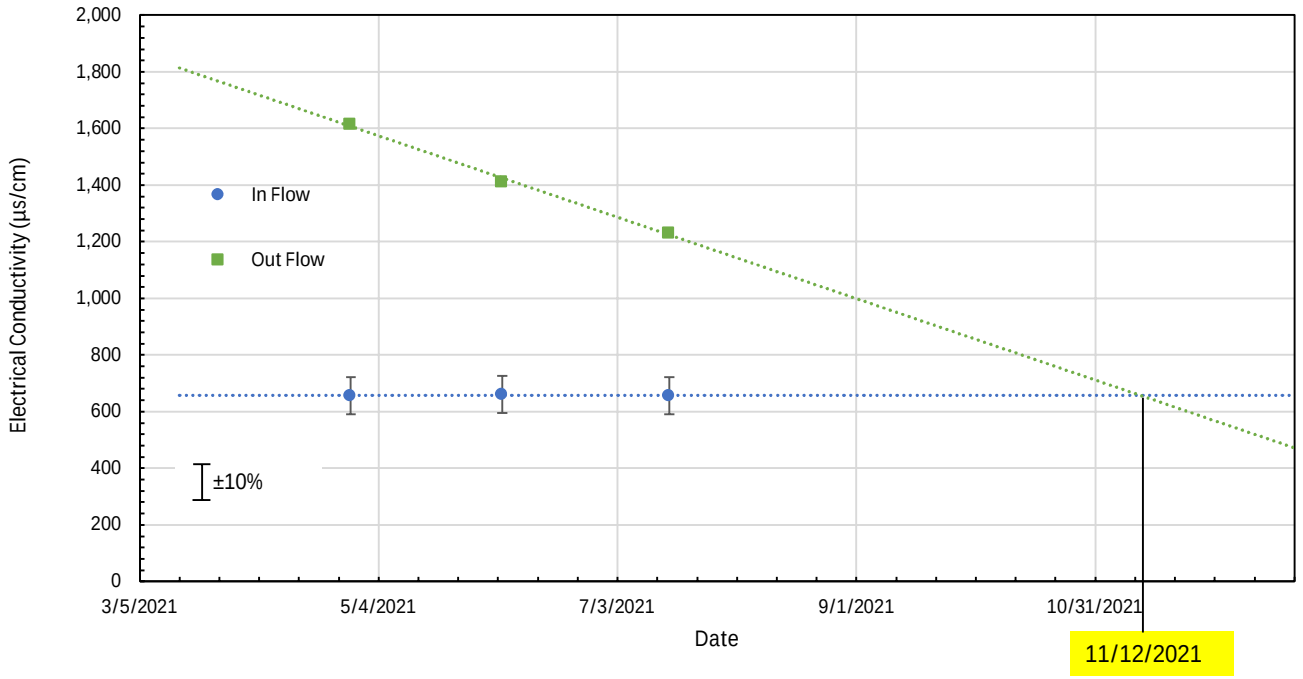
Figure 4



B1-ST-1 (7-9') Electrical Conductivity (EC) with Time

BELLE RIVER POWER PLANT
EAST CHINA TOWNSHIP, MICHIGAN

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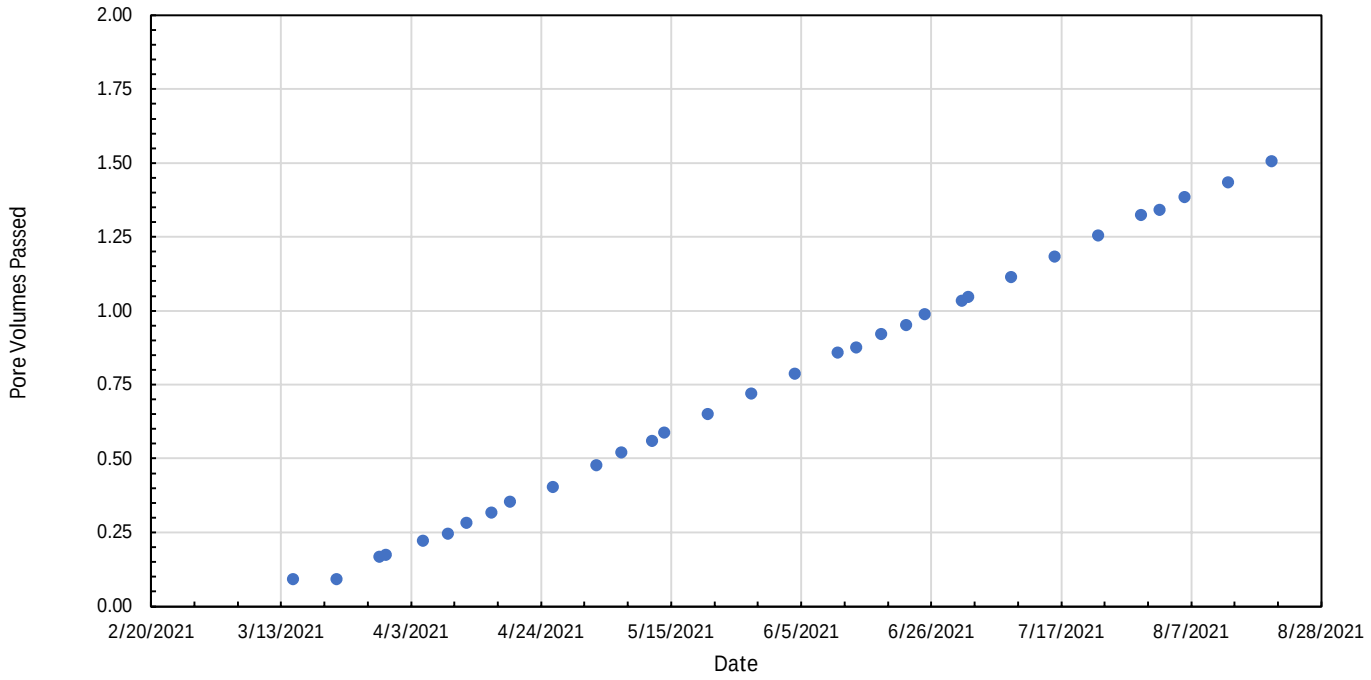
Figure 5



B2-ST-1 (1-3') PV of Flow with Time

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EAST CHINA TOWNSHIP, MICHIGAN

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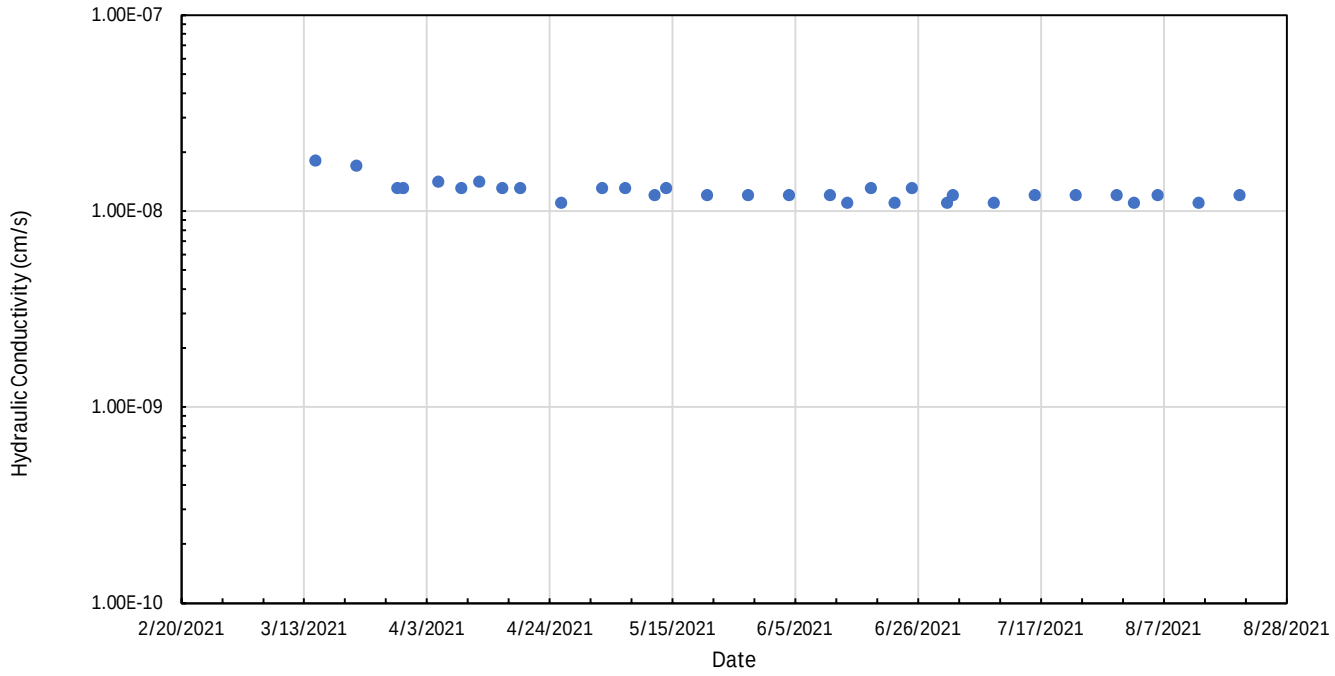
Figure 6



B2-ST-1 (1-3') Hydraulic Conductivity with Time

BELLE RIVER POWER PLANT
EAST CHINA TOWNSHIP, MICHIGAN

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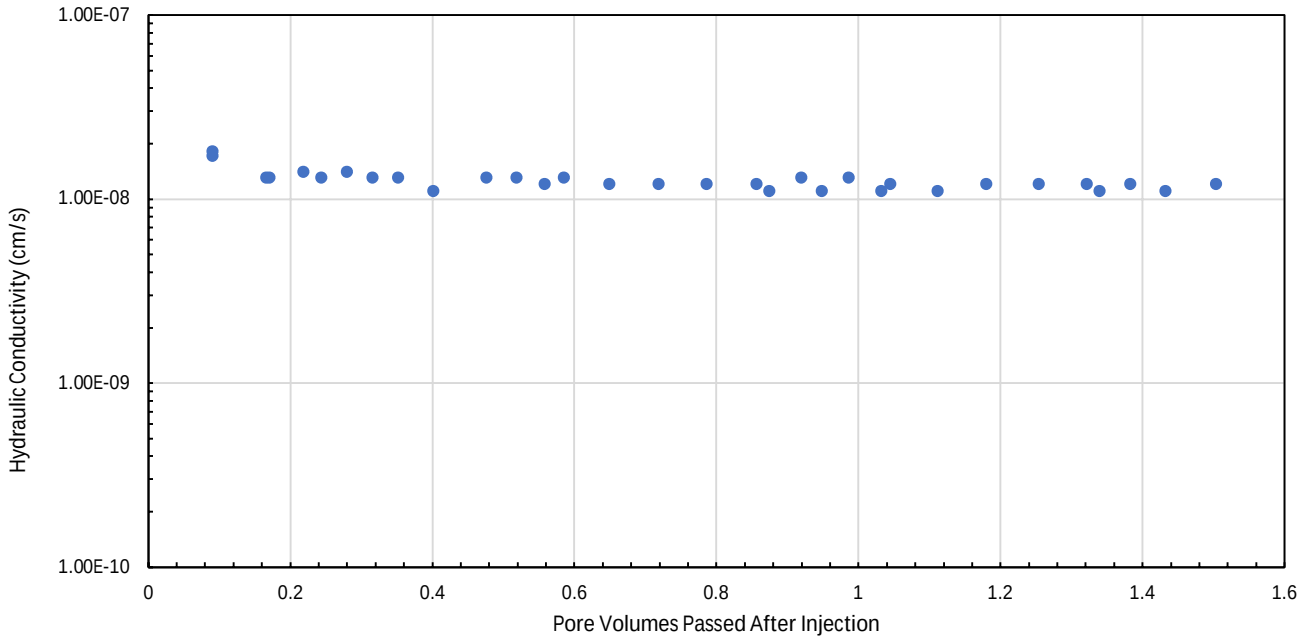
Figure 7



B2-ST-1 (1-3') Hydraulic Conductivity with PV

BELLE RIVER POWER PLANT
EAST CHINA TOWNSHIP, MICHIGAN

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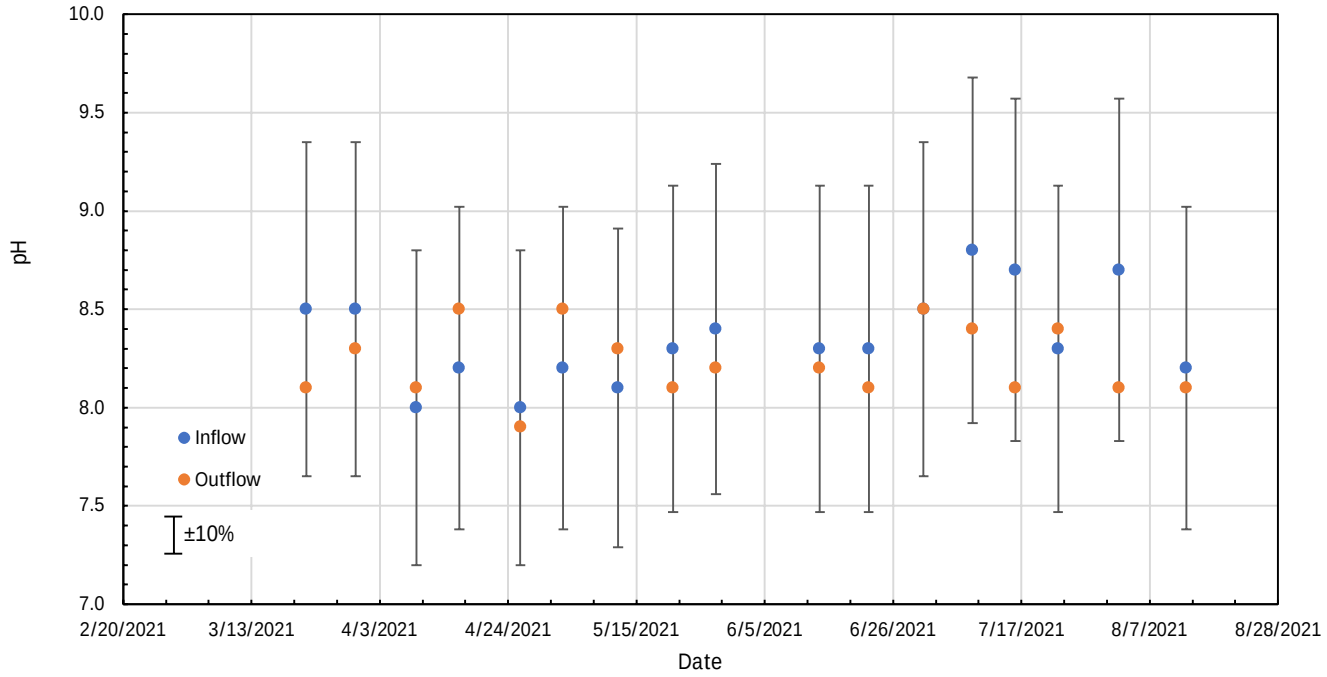
Figure 8



B2-ST-1 (1-3') pH of Inflow and Outflow with Time

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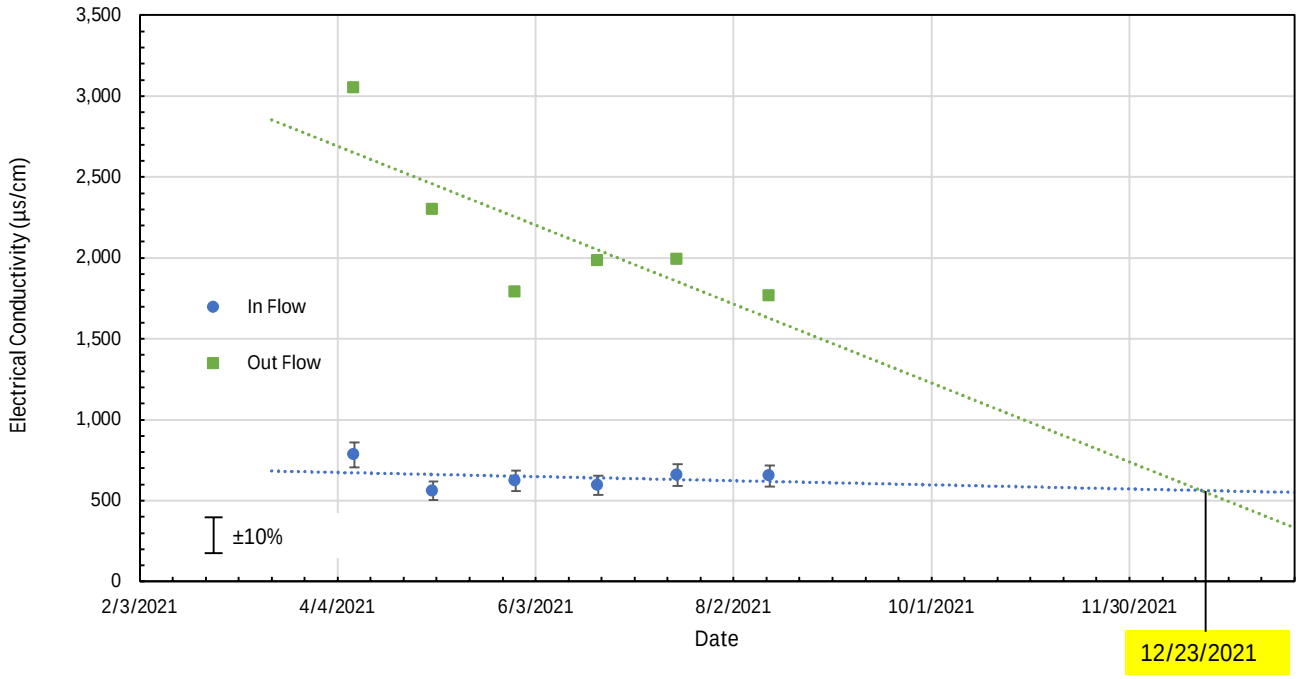
Figure 9



B2-ST-1 (1-3') Electrical Conductivity (EC) with Time

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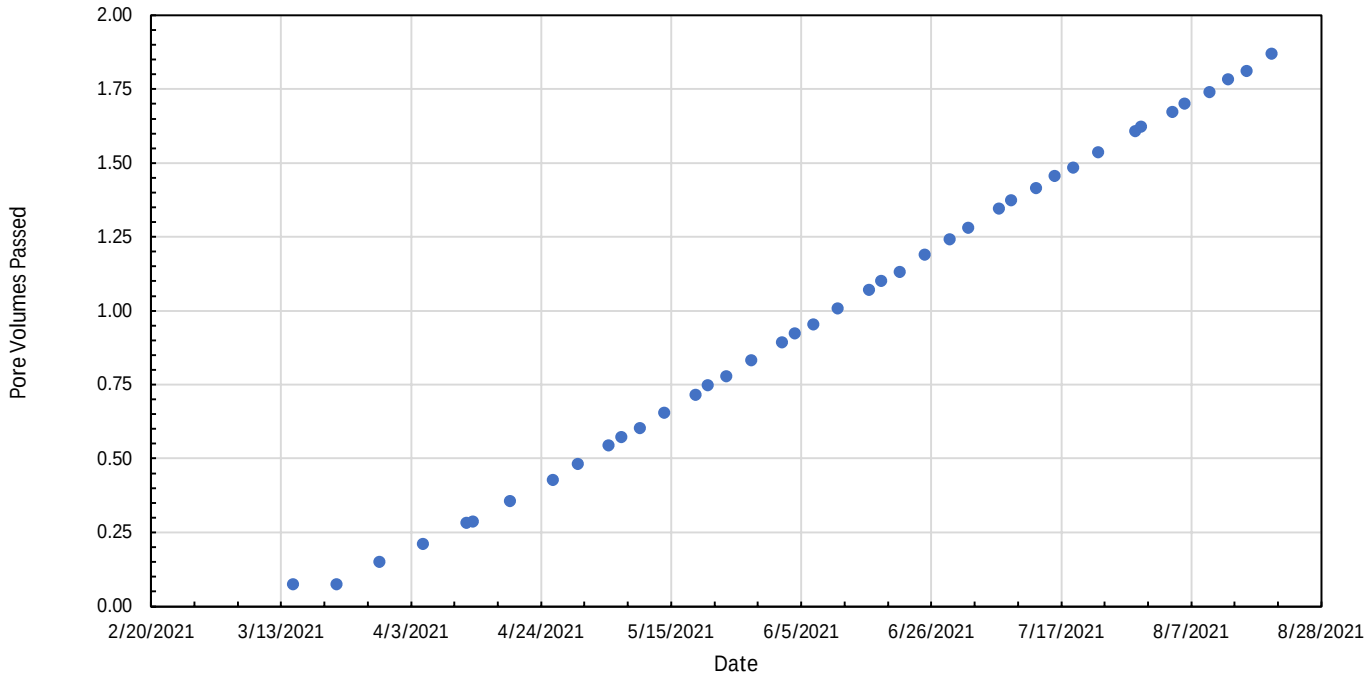
Figure 10



B2-ST-4 (47-49') PV of Flow With Time

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EAST CHINA TOWNSHIP, MICHIGAN

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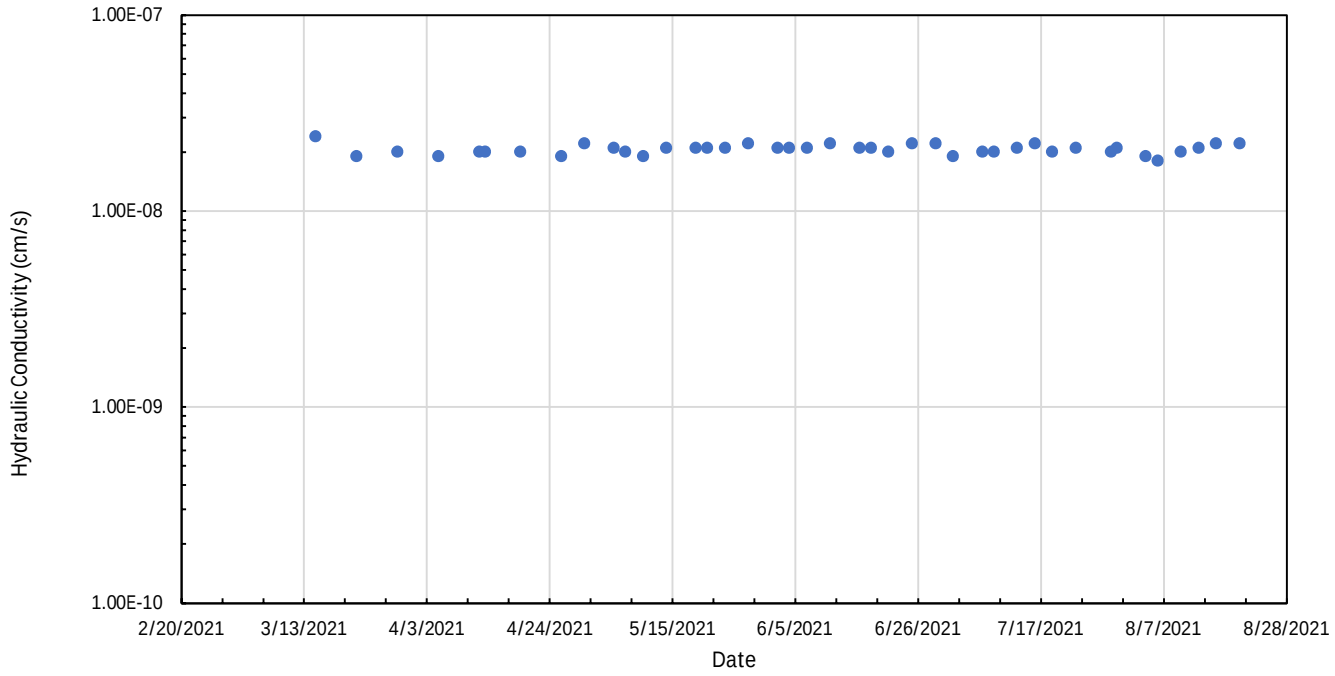
Figure 11



B2-ST-4 (47-49') Hydraulic Conductivity with Time

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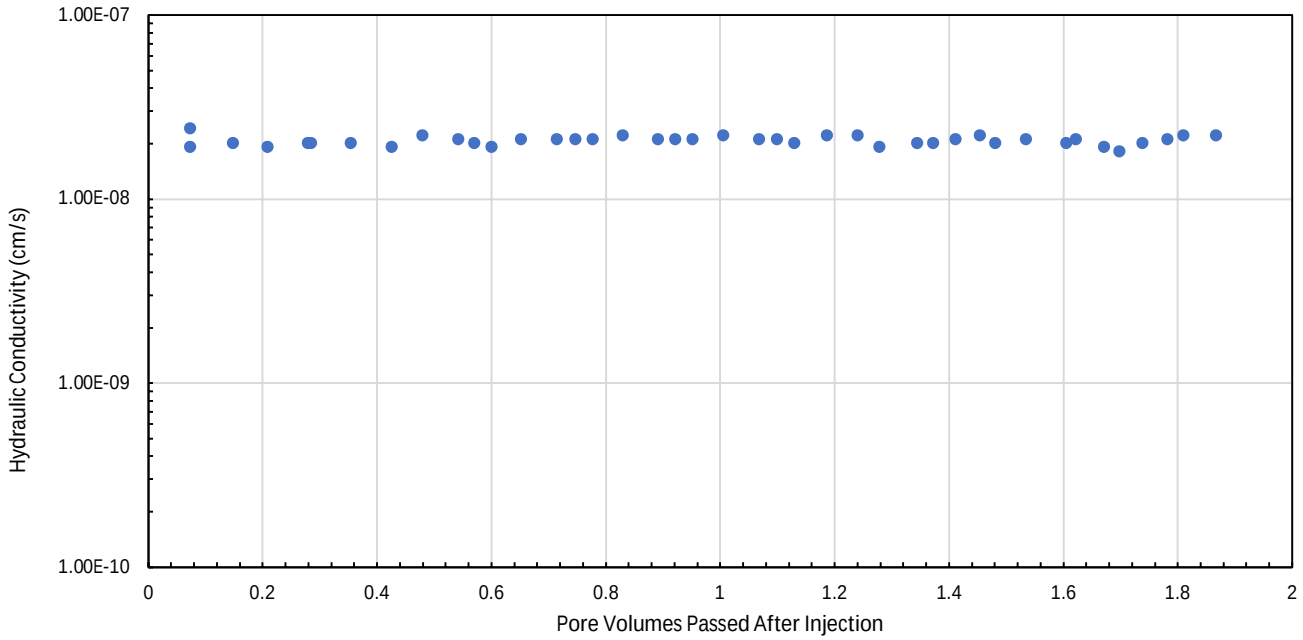
Figure 12



B2-ST-4 (47-49') Hydraulic Conductivity with PV

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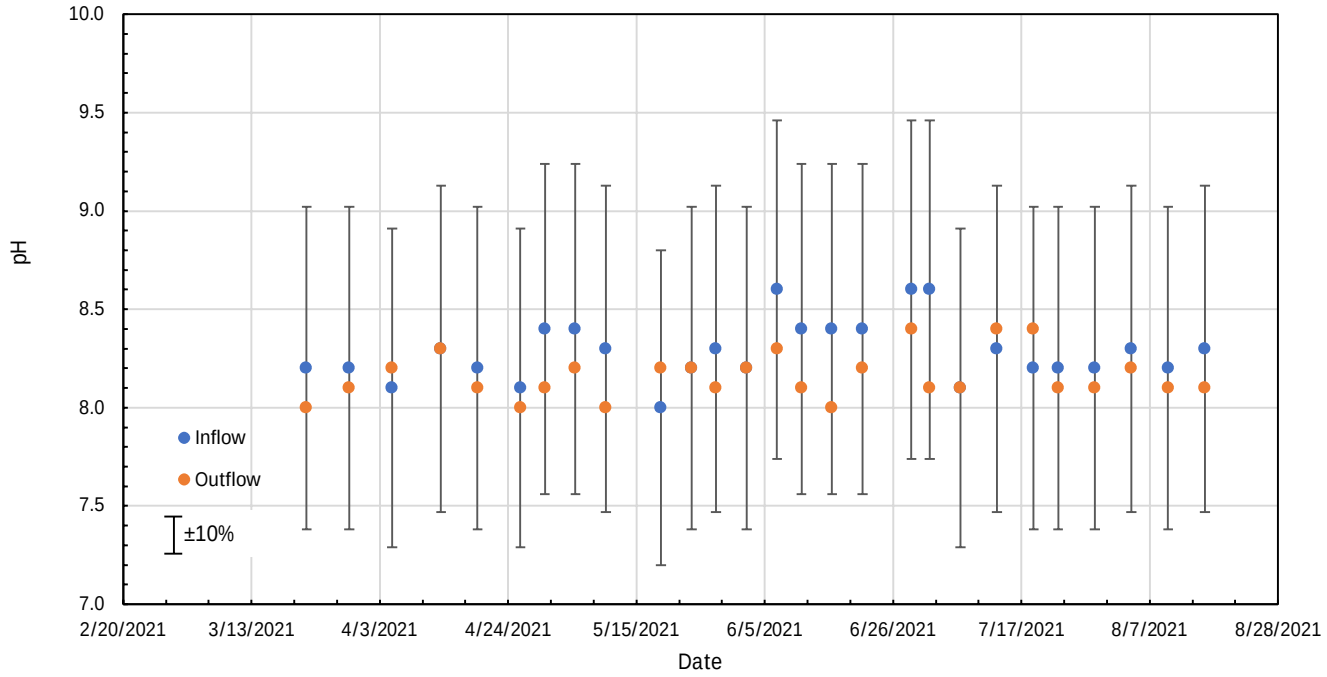
Figure 13



B2-ST-4 (47-49') pH of Inflow and Outflow with Time

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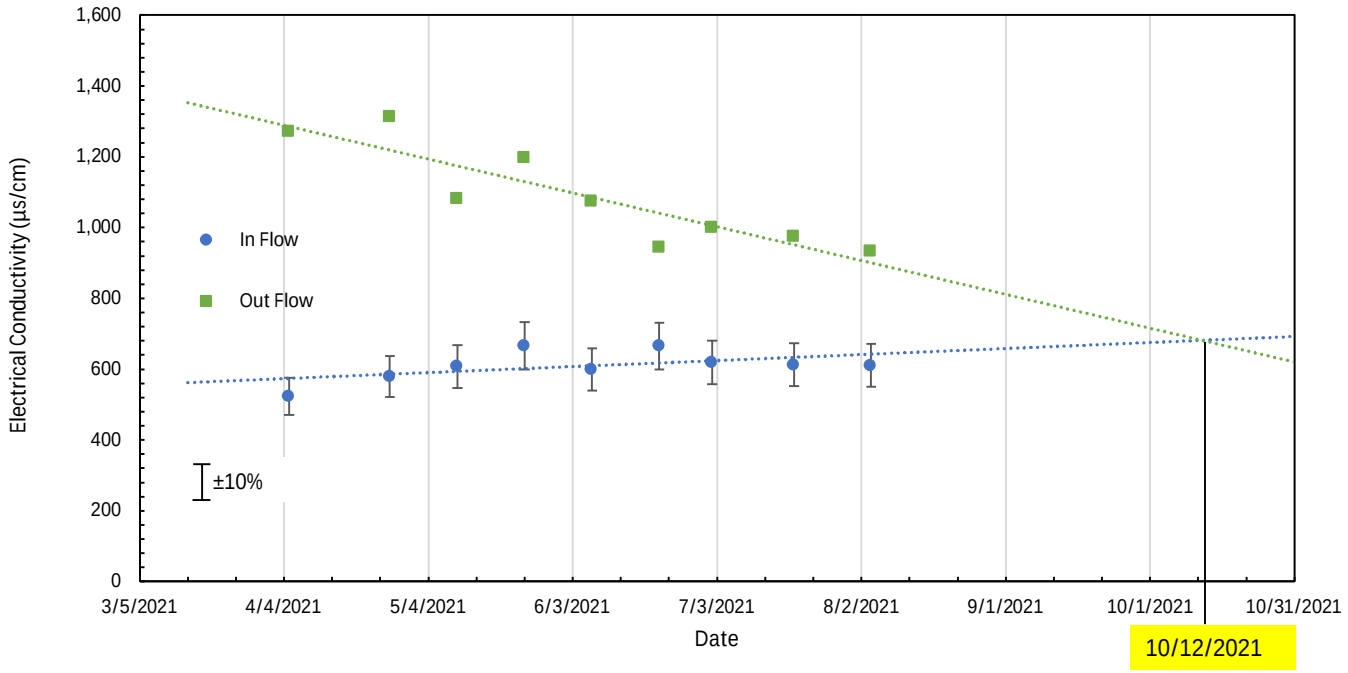
Figure 14



B2-ST-4 (47-49') Electrical Conductivity (EC) with Time

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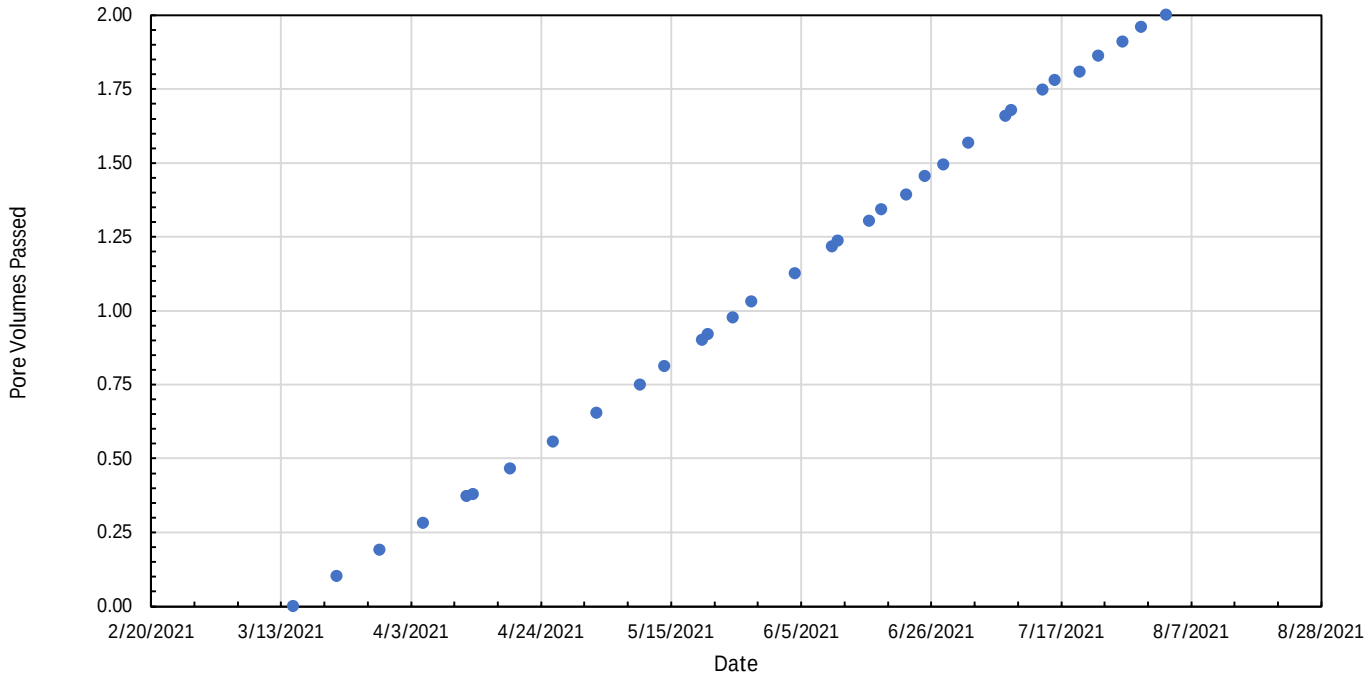
Figure 15



B3-ST-5 (77-79') PV of Flow with Time

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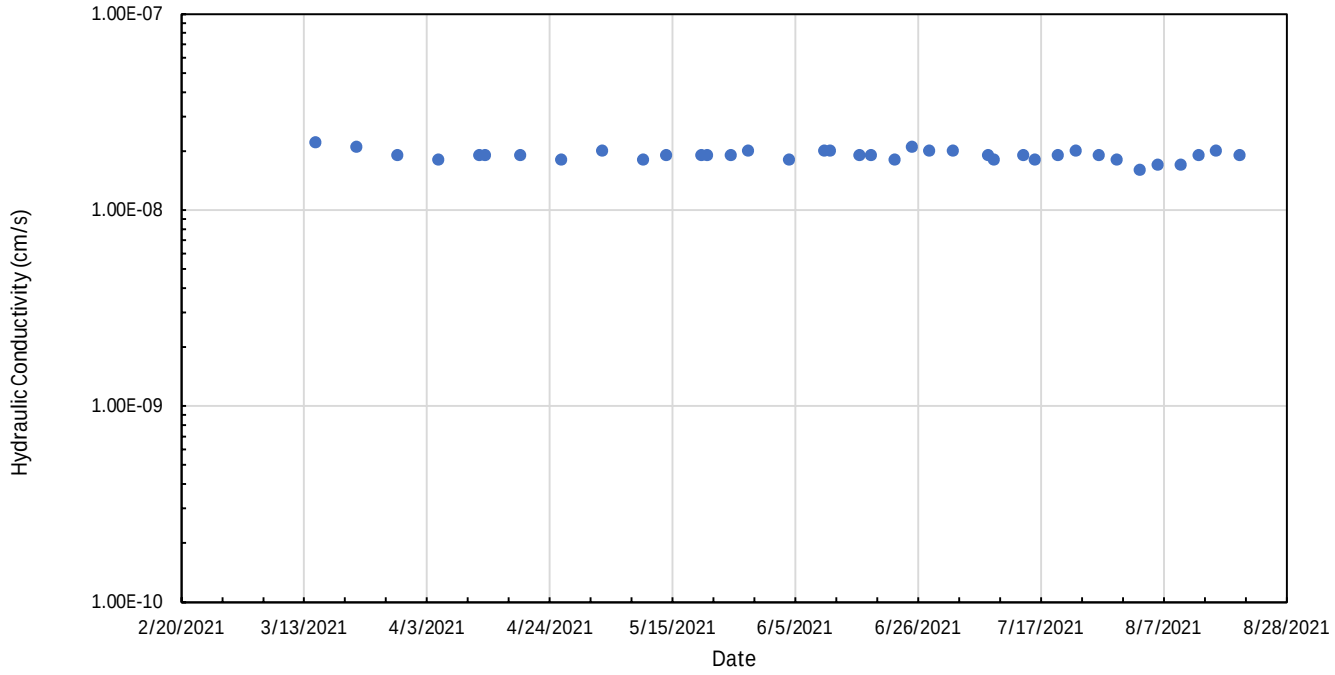
Figure 16



B3-ST-5 (77-79') Hydraulic Conductivity with Time

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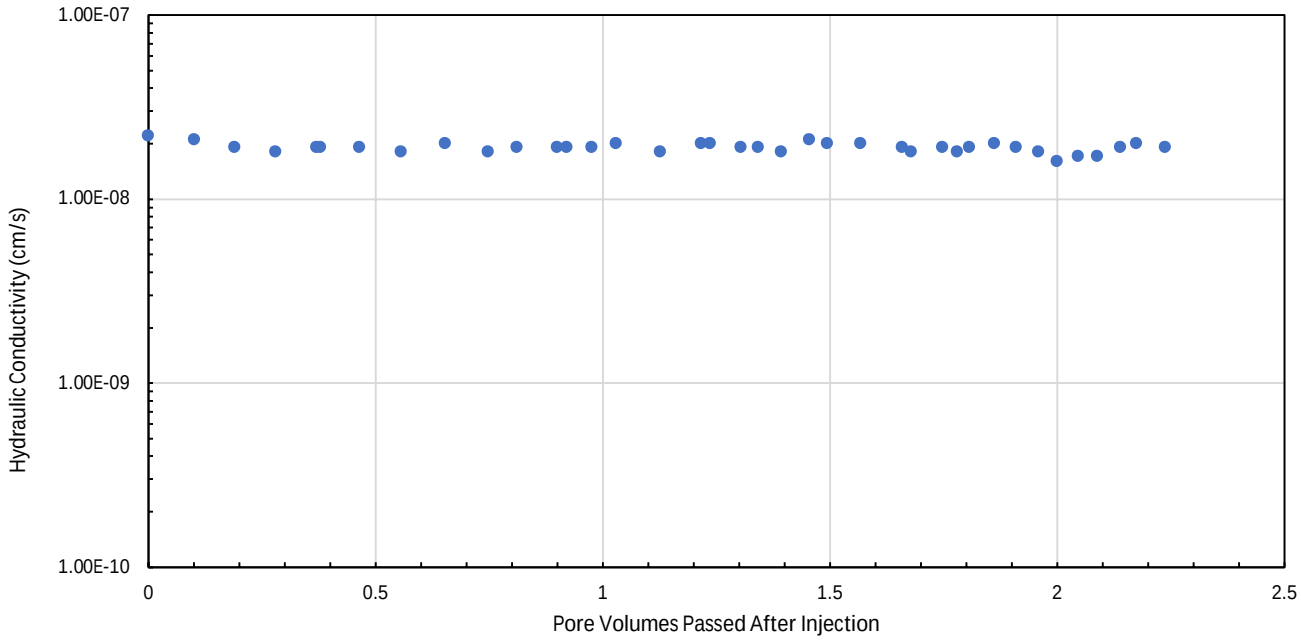
Figure 17



B3-ST-5 (77-79') Hydraulic Conductivity with PV

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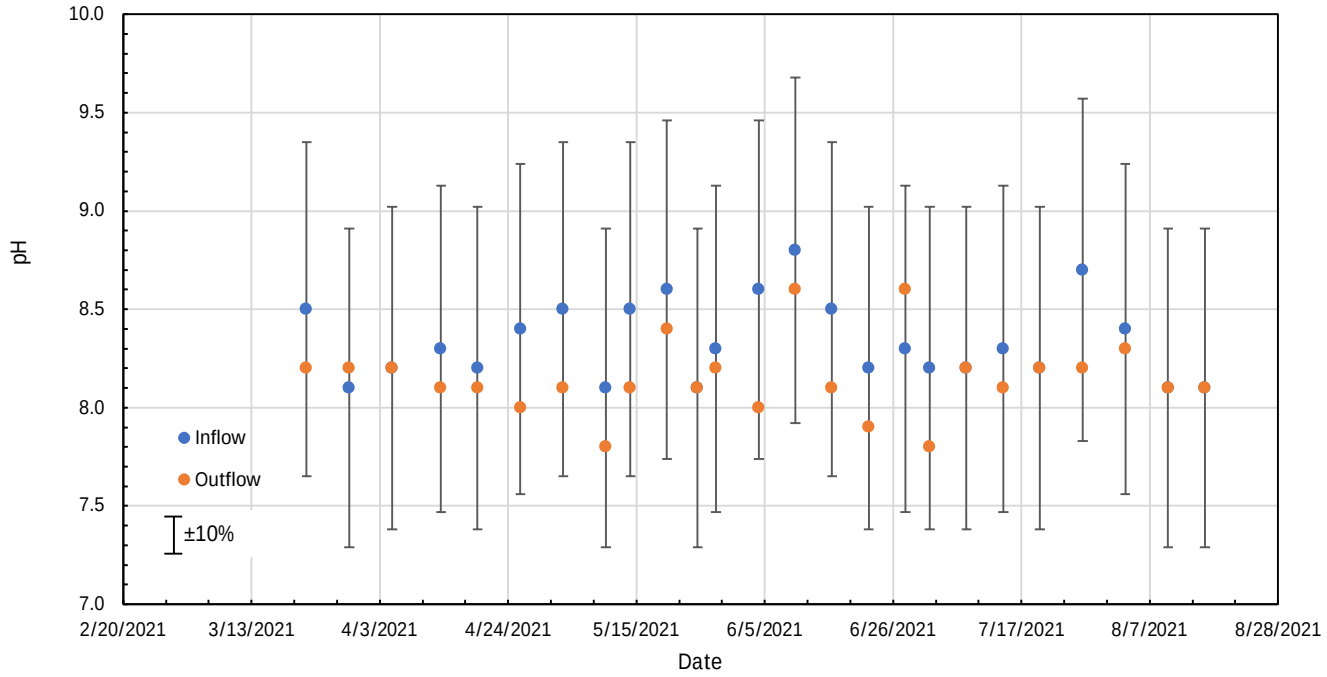
Figure 18



B3-ST-5 (77-79') pH of Inflow and Outflow with Time

BELLE RIVER POWER PLANT
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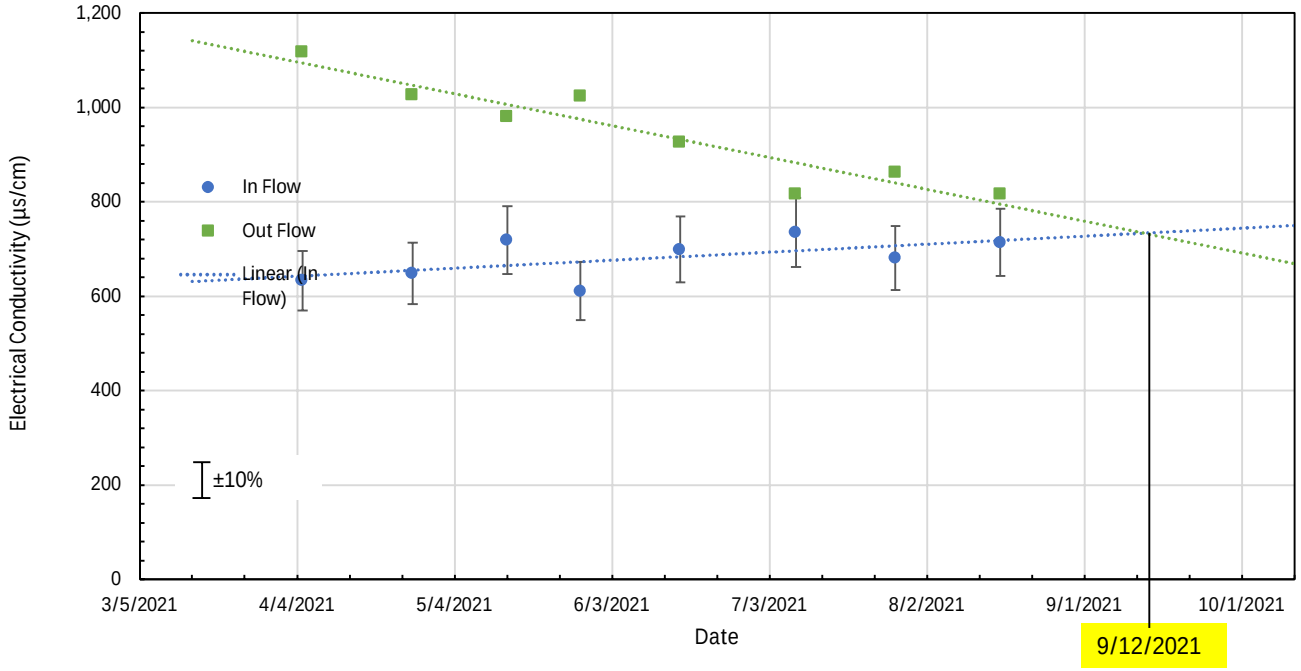
Figure 19



B3-ST-5 (77-79') Electrical Conductivity (EC) with Time

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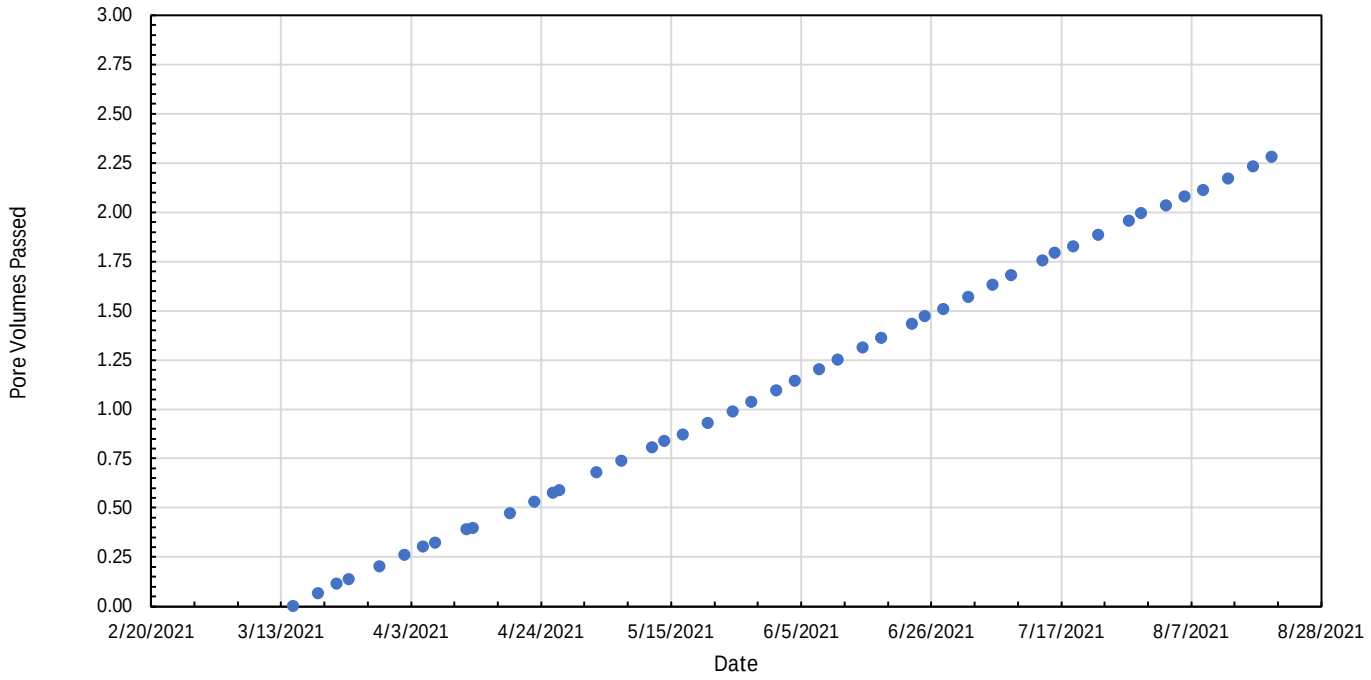
Figure 20



B4-ST-3 (47-49') PV of Flow With Time

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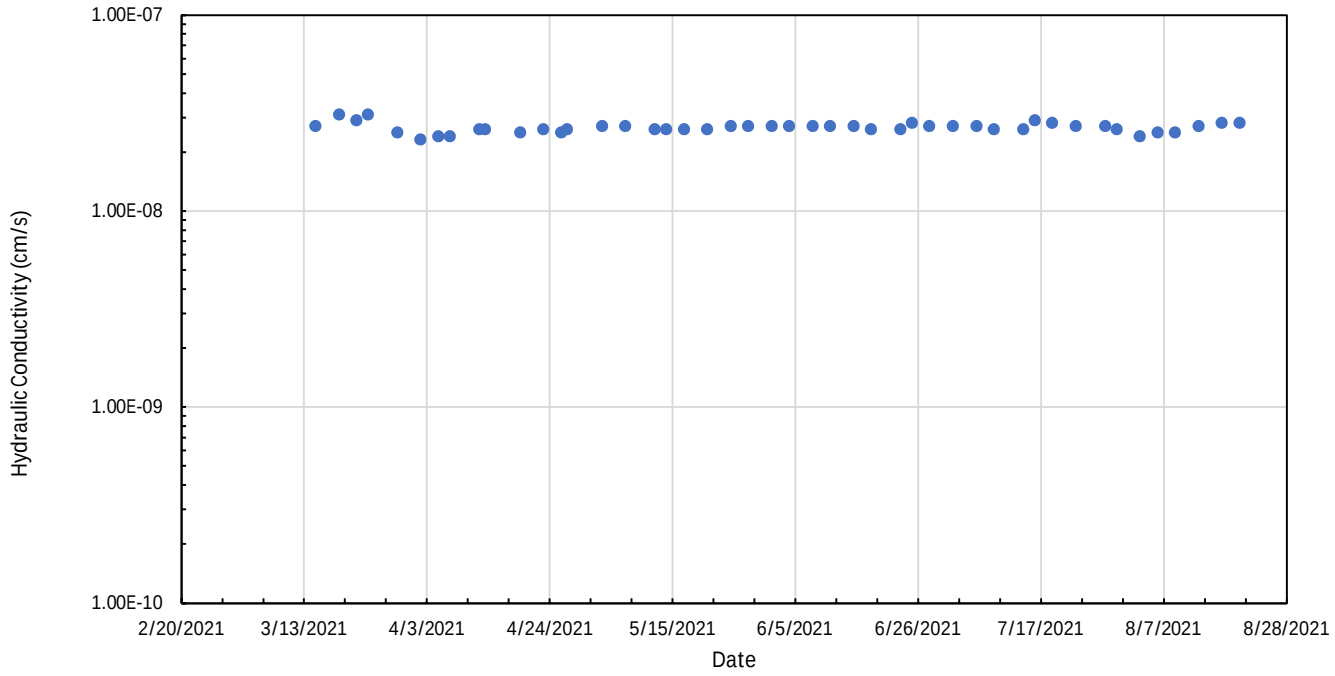
Figure 21



B4-ST-3 (47-49') Hydraulic Conductivity with Time

BELLE RIVER POWER PLANT
EAST CHINA TOWNSHIP, MICHIGAN

Geosyntec consultants

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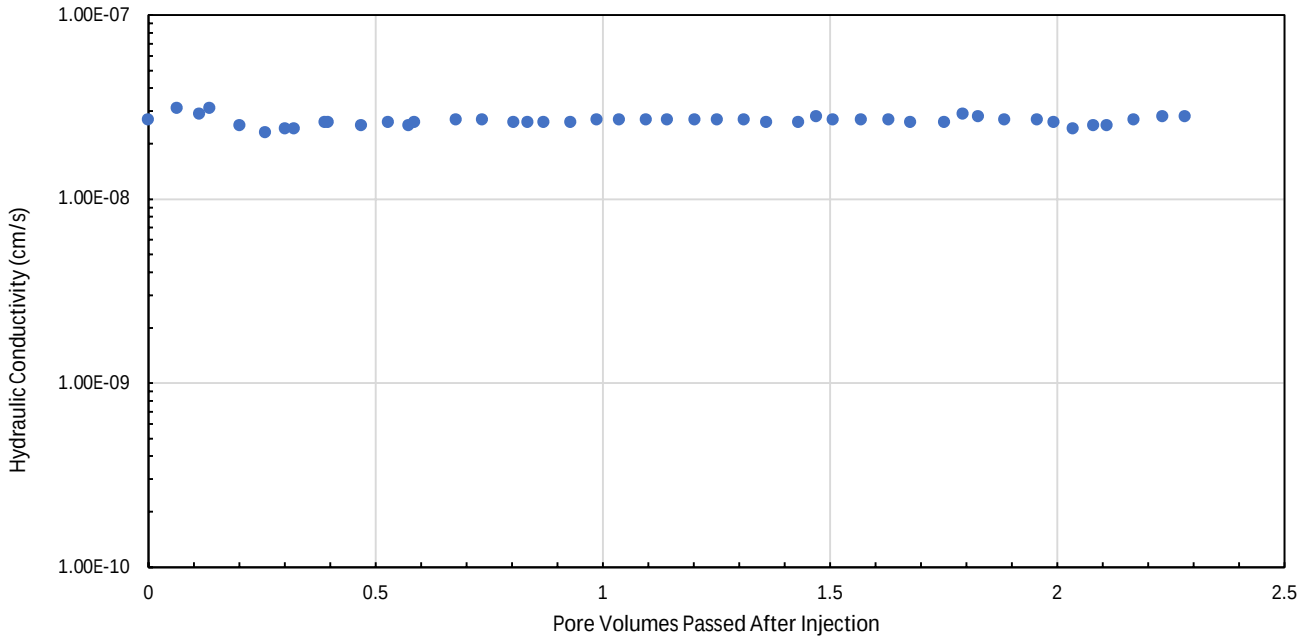
Figure 22



B4-ST-3 (47-49') Hydraulic Conductivity with PV

BELLE RIVER POWER PLANT
EAST CHINA TOWNSHIP, MICHIGAN

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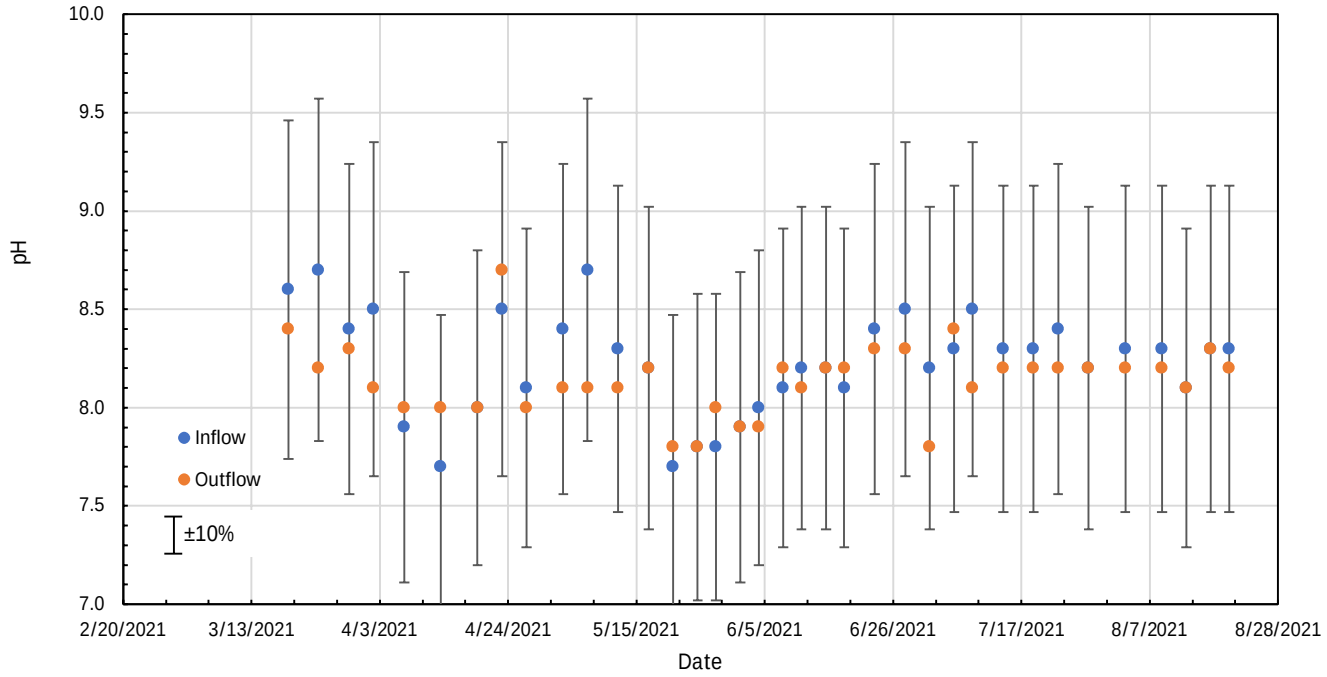
Figure 23



B4-ST-3 (47-49') pH of Inflow and Outflow with Time

BELLE RIVER POWER PLANT
EAST CHINA TOWNSHIP, MICHIGAN

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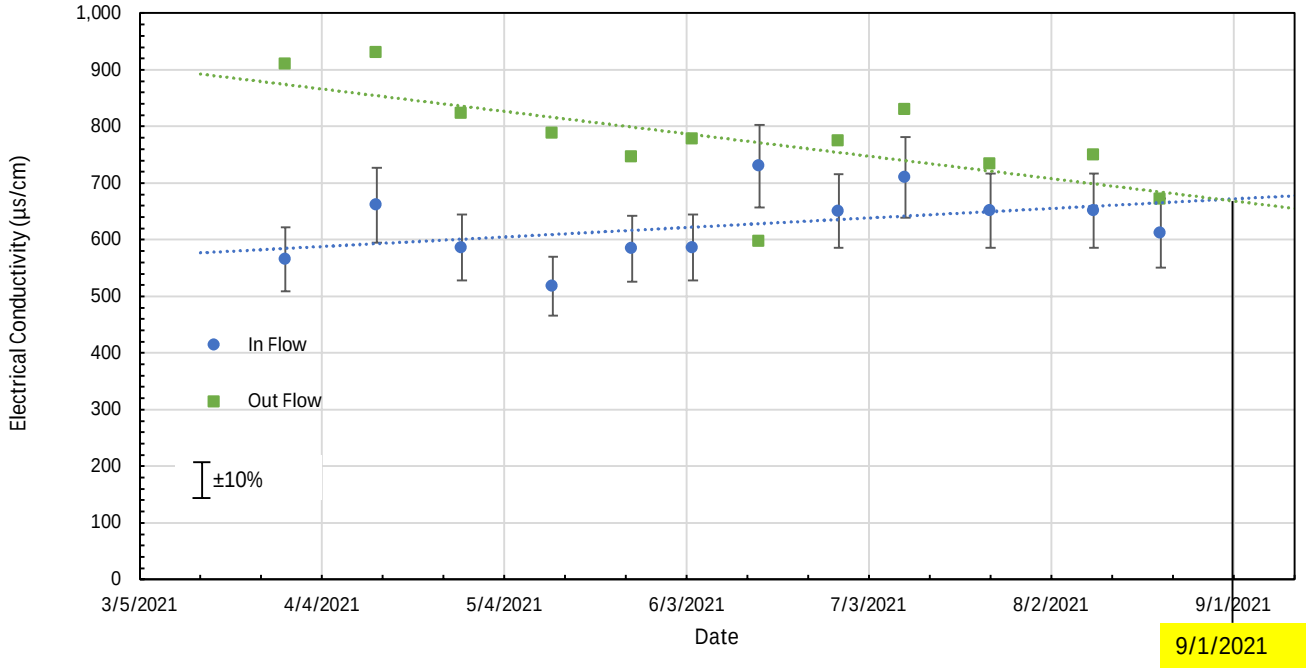
Figure 24



B4-ST-3 (47-49') Electrical Conductivity (EC) with Time

BELLE RIVER POWER PLANT
EAST CHINA TOWNSHIP, MICHIGAN

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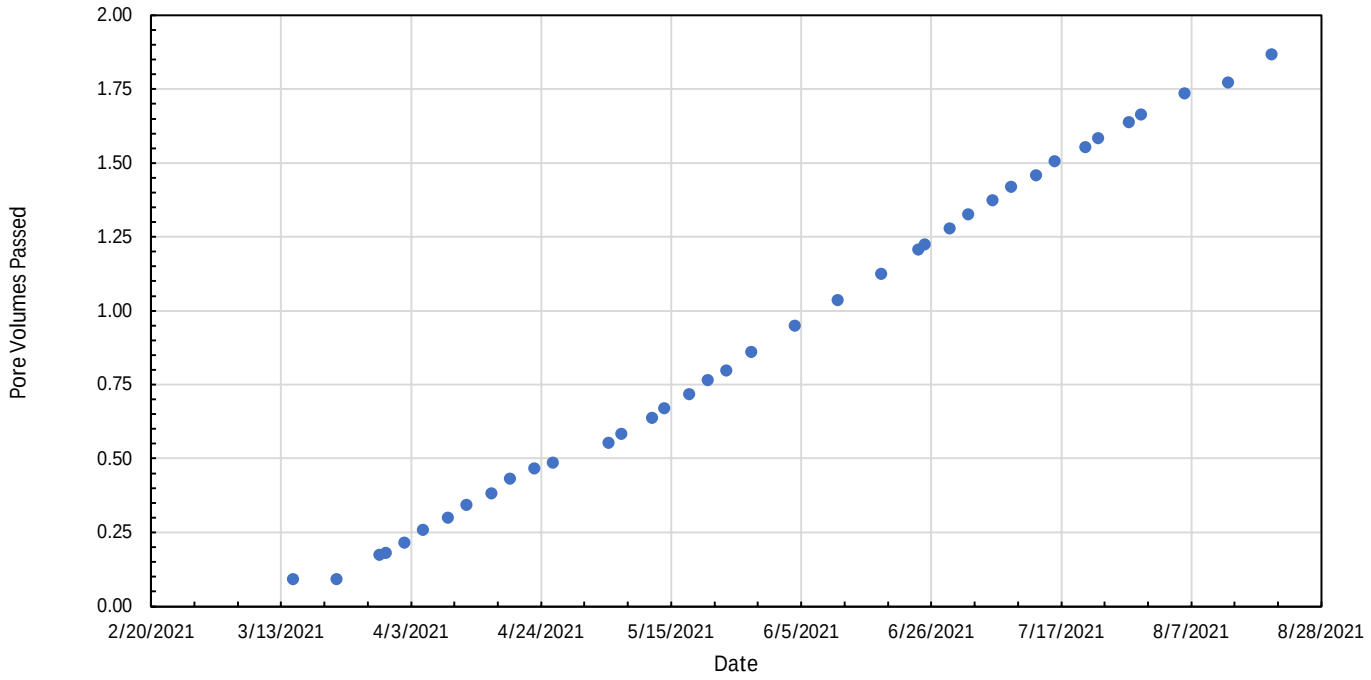
Figure 25



B5-ST-5 (87-89') PV of Flow with Time

BELLE RIVER POWER PLANT
EAST CHINA TOWNSHIP, MICHIGAN

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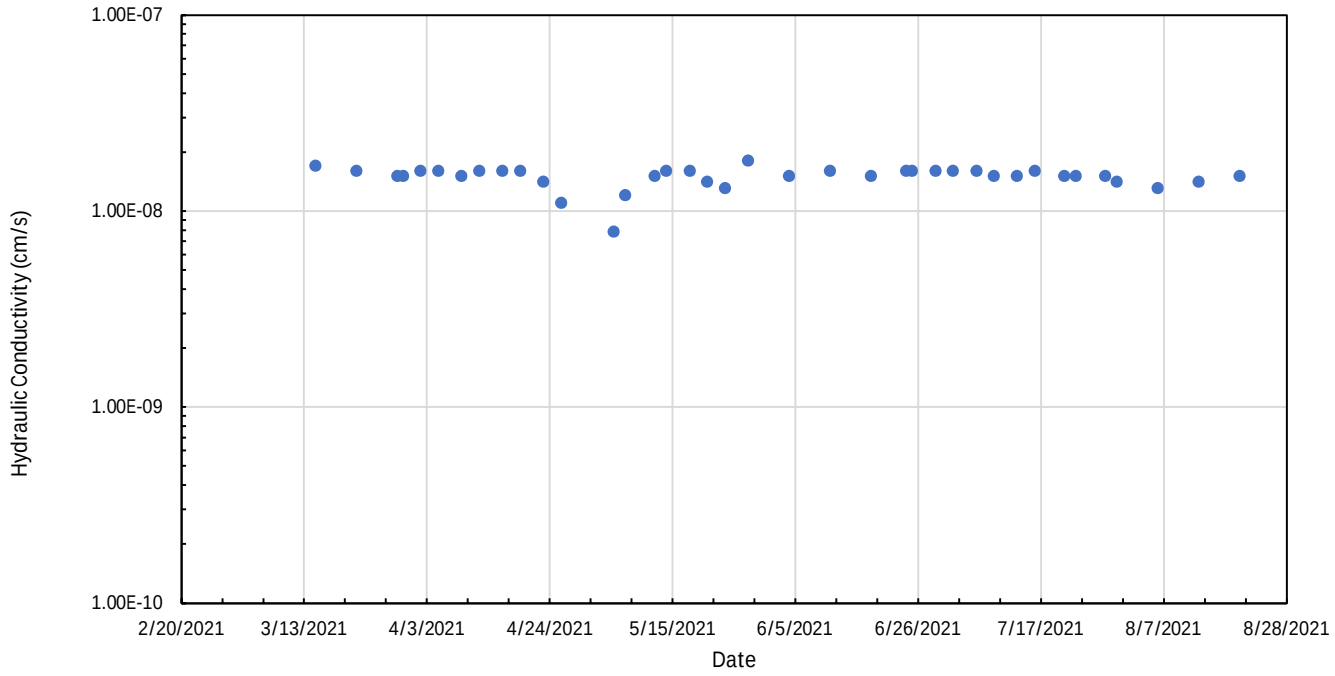
Figure 26



B5-ST-5 (87-89') Hydraulic Conductivity with Time

BELLE RIVER POWER PLANT
EAST CHINA TOWNSHIP, MICHIGAN

Geosyntec consultants

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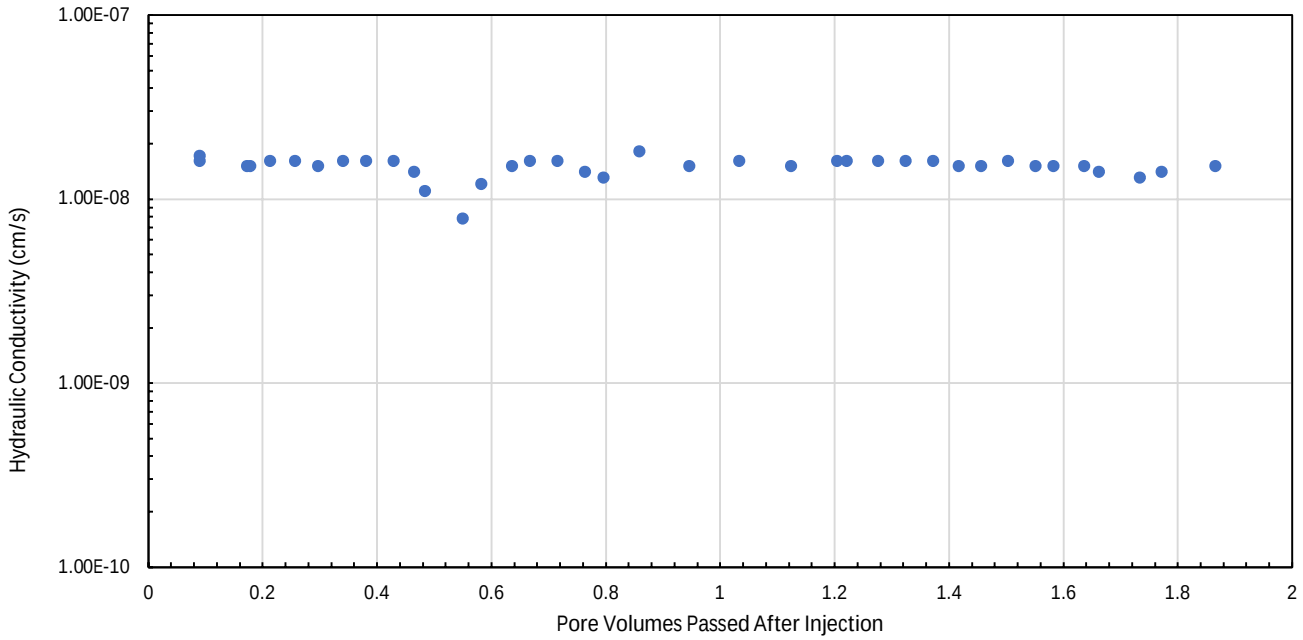
Figure 27



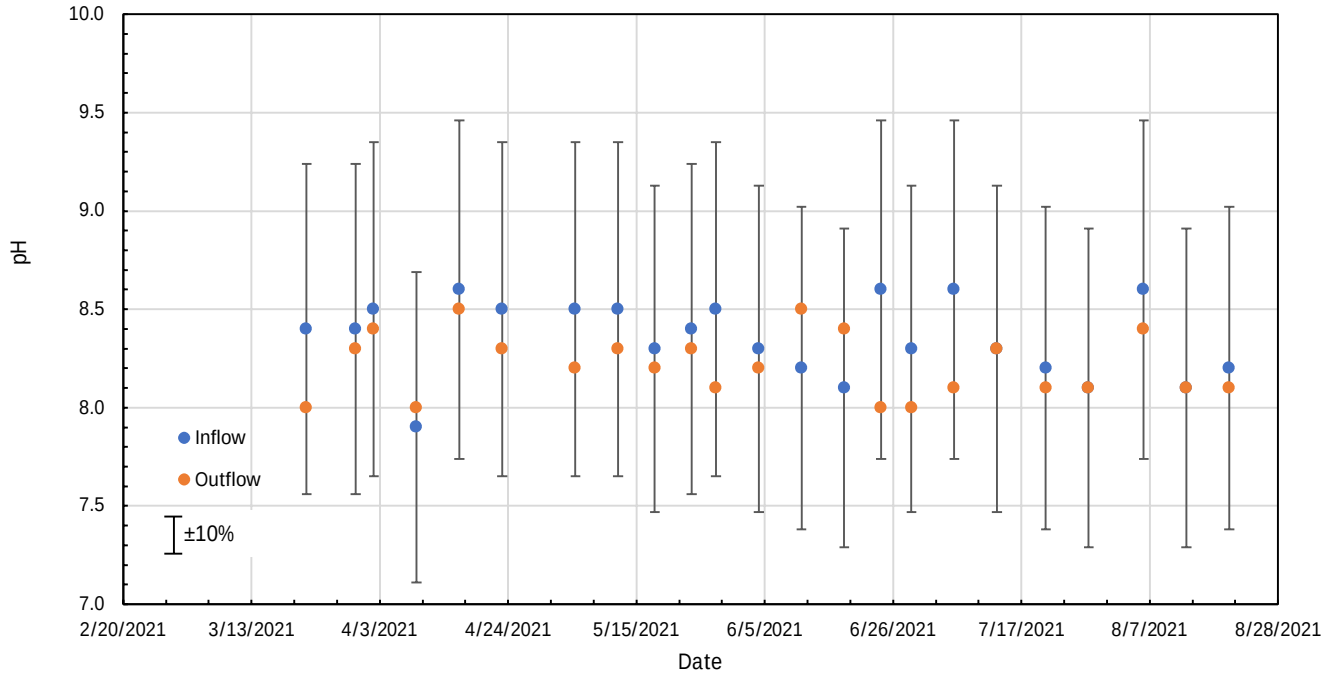
B5-ST-5 (87-89') Hydraulic Conductivity with PV

BELLE RIVER POWER PLANT
EAST CHINA TOWNSHIP, MICHIGAN

Geosyntec consultants

Ann Arbor, MI | September 2021

Figure 28



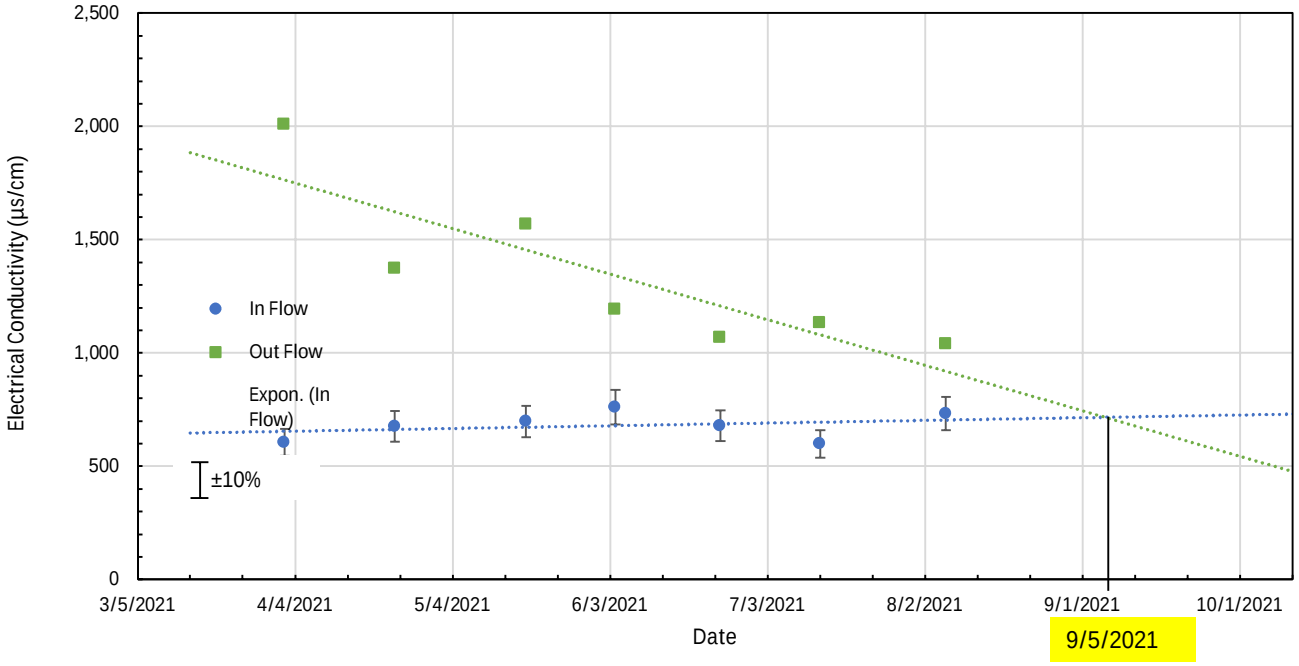
B5-ST-5 (87-89') pH of Inflow and Outflow with Time

BELLE RIVER POWER PLANT
EAST CHINA TOWNSHIP, MICHIGAN

Geosyntec consultants

Ann Arbor, MI | September 2021

Figure 29



B5-ST-5 (87-89') Electrical Conductivity (EC) with Time

BELLE RIVER POWER PLANT
EAST CHINA TOWNSHIP, MICHIGAN

Geosyntec consultants

Ann Arbor, MI | September 2021

Figure 30

APPENDIX A

Invoice Number	Invoice Date	Account Number	Page
7-221-87386	Dec 22, 2020	2970-2196-6	1 of 4

Billing Address:
GEOSYNTEC CONSULTANTS
SONYA BRIGGS
900 BROKEN SOUND PKWY STE 200
BOCA RATON FL 33487-3513

Shipping Address:
GEOSYNTEC CONSULTANTS
2100 COMMONWEALTH BLVD STE 100
ANN ARBOR MI 48105-1574

Invoice Questions?
Contact FedEx Revenue Services
Phone: 800.622.1147
M-F 7 AM to 8 PM CST
Sa 7 AM to 6 PM CST
Internet: fedex.com

Invoice Summary

FedEx Express Services

Total Charges	USD	$2,044.19
TOTAL THIS INVOICE	**USD**	**$2,044.19**

You saved $3,095.71 in discounts this period!

Shipments included in this invoice received an earned discount. If you would like to know how it was calculated, please go to the following URL: https://www.fedex.com/EarnedDiscounts/.
Other discounts may apply.

Detailed descriptions of surcharges can be located at fedex.com

To ensure proper credit, please return this portion with your payment to FedEx.
Please do not staple or fold.
Please make check payable to FedEx.

Invoice Number	Invoice Amount	Account Number
7-221-87386	USD $2,044.19	2970-2196-6

Remittance Advice

Your payment is due by Jan 06, 2021

7221873867000204419629702196690000000000000020441960

GEOSYNTEC CONSULTANTS
SONYA BRIGGS
900 BROKEN SOUND PKWY STE 200
BOCA RATON FL 33487-3513

FedEx
P.O. Box 660481
DALLAS TX 75266-0481

FedEx Express Shipment Summary By Reference

FedEx Express Shipments (Original)

Reference	Shipments	Rated Weight lbs	Transportation Charges	Special Handling Charges	Ret Chg/Tax Credits/Other	Discounts	Total Charges
NO REFERENCE INFORMATION	2	88.0	502.48	67.64		-331.63	238.49
Total	**2**	**88.0**	**$502.48**	**$67.64**		**-$331.63**	**$238.49**

FedEx Express Multiweight Shipments (Original)

Reference	Packages	Rated Weight lbs	Transportation Charges	Special Handling Charges	Ret Chg/Tax Credits/Other	Discounts	Total Charges
NO REFERENCE INFORMATION	11	698.0	4,188.00	381.78		-2,764.08	1,805.70
Total	**11**	**698.0**	**$4,188.00**	**$381.78**		**-$2,764.08**	**$1,805.70**

	Shipments	Rated Weight lbs	Transportation Charges	Special Handling Charges	Ret Chg/Tax Credits/Other	Discounts	Total Charges
Total FedEx Express	**13**	**786.0**	**$4,690.48**	**$449.42**		**-$3,095.71**	**$2,044.19**

TOTAL THIS INVOICE **USD** **$2,044.19**

FedEx Express Shipment Detail By Reference (Original)

Ship Date: Dec 17, 2020 **Cust. Ref.:** NO REFERENCE INFORMATION **Ref.#2:**
Payor: Third Party **Ref.#3:**

The Earned Discount for this ship date has been calculated based on a revenue threshold of $ 1124632.95
Fuel Surcharge - FedEx has applied a fuel surcharge of 4.75% to this shipment.
Distance Based Pricing, Zone 2
Package sent from: 48170 zip code

		Sender	Recipient	
Automation	SSFO			
Tracking ID	781602453566	Mike Coram	ALS Enviornmental	
Service Type	FedEx Priority Overnight	SUITE 100	Attn: Recieving	
Package Type	Customer Packaging	ANN ARBOR MI 48105 US	3352 128th Ave	
Zone	02		HOLLAND MI 49424 US	
Packages	1			
Rated Weight	31.0 lbs, 14.1 kgs	Transportation Charge		82.15

Continued on next page

Tracking ID: 781602453566 continued

Declared Value	USD 500.00	Discount		-46.00
Delivered	Dec 18, 2020 10:10	Earned Discount		-8.22
Svc Area	A4	Fuel Surcharge		2.18
Signed by	A.WIERENGA	Direct Signature		0.00
FedEx Use	000000000/1486/_	Additional Handling Charge - Package		13.00
		Declared Value Charge		5.25
		Peak - AHS Charge		4.90
		Total Charge	**USD**	**$53.26**

Ship Date: Dec 17, 2020 **Cust. Ref.:** NO REFERENCE INFORMATION **Ref.#2:**
Payor: Third Party **Ref.#3:**

The Earned Discount for this ship date has been calculated based on a revenue threshold of $ 1124632.95
Fuel Surcharge - FedEx has applied a fuel surcharge of 4.75% to this shipment.
Distance Based Pricing, Zone 6
Package sent from: 48170 zip code

		Sender	**Recipient**	
Automation	SSFO	Mike Coram	ALS Ft. Collins	
Tracking ID	781602649731	SUITE 100	Attn: Sample Recieving	
Service Type	FedEx Priority Overnight	ANN ARBOR MI 48105 US	225 Commerce Dr	
Package Type	Customer Packaging		FORT COLLINS CO 80524 US	
Zone	06			
Packages	1			
Rated Weight	57.0 lbs, 25.9 kgs	Transportation Charge		420.33
Declared Value	USD 500.00	Discount		-235.38
Delivered	Dec 18, 2020 12:04	Earned Discount		-42.03
Svc Area	A2	Fuel Surcharge		8.16
Signed by	T.YLER	Direct Signature		0.00
FedEx Use	000000000/1574/_	Declared Value Charge		5.25
		Additional Handling Charge - Weight		24.00
		Peak - AHS Charge		4.90
		Total Charge	**USD**	**$185.23**

NO REFERENCE INFORMATION Reference Subtotal USD $238.49

FedEx Express Multiweight - Third Party Detail (Original)

Ship Date: Dec 17, 2020 **Service Type:** FedEx Priority Overnight **Svc Area:** A1
Payor: Third Party **Rate Method:** Hundredwt **Rated Wgt:** 698.0 lbs, 316.6 kgs
Bundle ID: 2317461 **Zone:** 04 **# Packages:** 11
Package Type: Customer Packaging **Automation:** SSFO

Sender	**Recipient**
Sean Karoly	Nader S. Rad
Geosyntec Consultants	Excel Geotechnical Testing inc
SUITE 100	953 Forrest st
ANN ARBOR MI 48105 US	ROSWELL GA 30075 US

Tracking ID	Delivered/Signed By	Rated Weight/Actual Weight	Declared Value	FedEx Use	Cust. Ref./Ref.#2/Ref.#3/RMA #	Amount
781594706019	Dec 18, 2020 11:51 R.RAMINRY	69.0 lbs, 31.3 kgs	USD 1.00	000000000/1530/_	NO REFERENCE INFORMATION	177.75

The Earned Discount for this ship date has been calculated based on a revenue threshold of $ 1124632.95
Fuel Surcharge - FedEx has applied a fuel surcharge of 4.75% to this shipment.
Distance Based Pricing, Zone 4
FedEx has audited this shipment for correct packages, weight, and service. Any changes made are reflected in the invoice amount.

781594706030	Dec 18, 2020 11:51 R.RAMINRY	78.0 lbs, 35.4 kgs	USD 1.00	000000000/1530/_	NO REFERENCE INFORMATION	197.16

The Earned Discount for this ship date has been calculated based on a revenue threshold of $ 1124632.95
Fuel Surcharge - FedEx has applied a fuel surcharge of 4.75% to this shipment.
Distance Based Pricing, Zone 4
FedEx has audited this shipment for correct packages, weight, and service. Any changes made are reflected in the invoice amount.

781594705983	Dec 18, 2020 11:51 R.RAMINRY	71.0 lbs, 32.2 kgs	USD 1.00	000000000/1530/_	NO REFERENCE INFORMATION	182.06

The Earned Discount for this ship date has been calculated based on a revenue threshold of $ 1124632.95
Fuel Surcharge - FedEx has applied a fuel surcharge of 4.75% to this shipment.
Distance Based Pricing, Zone 4
FedEx has audited this shipment for correct packages, weight, and service. Any changes made are reflected in the invoice amount.

781594705961	Dec 18, 2020 11:51 R.RAMINRY	30.0 lbs, 13.6 kgs 24.0 lbs, 10.9 kgs	USD 1.00	000000000/1530/_	NO REFERENCE INFORMATION	84.62

The Earned Discount for this ship date has been calculated based on a revenue threshold of $ 1124632.95
Fuel Surcharge - FedEx has applied a fuel surcharge of 4.75% to this shipment.
Distance Based Pricing, Zone 4

FedEx has audited this shipment for correct packages, weight, and service. Any changes made are reflected in the invoice amount.
We calculated your charges based on a dimensional weight of 30.0 lbs, 50 in x 9 in x 9 in, using a dimensional factor of 139.

781594705972	Dec 18, 2020 11:51 R.RAMINRY	64.0 lbs, 29.0 kgs	USD 1.00	000000000/1530/_	NO REFERENCE INFORMATION	166.97

The Earned Discount for this ship date has been calculated based on a revenue threshold of $ 1124632.95
Fuel Surcharge - FedEx has applied a fuel surcharge of 4.75% to this shipment.
Distance Based Pricing, Zone 4
FedEx has audited this shipment for correct packages, weight, and service. Any changes made are reflected in the invoice amount.

781594705994	Dec 18, 2020 11:51 R.RAMINRY	77.0 lbs, 34.9 kgs	USD 1.00	000000000/1530/_	NO REFERENCE INFORMATION	195.01

The Earned Discount for this ship date has been calculated based on a revenue threshold of $ 1124632.95
Fuel Surcharge - FedEx has applied a fuel surcharge of 4.75% to this shipment.
Distance Based Pricing, Zone 4
FedEx has audited this shipment for correct packages, weight, and service. Any changes made are reflected in the invoice amount.

781594706020	Dec 18, 2020 11:51 R.RAMINRY	64.0 lbs, 29.0 kgs	USD 1.00	000000000/1530/_	NO REFERENCE INFORMATION	166.97

The Earned Discount for this ship date has been calculated based on a revenue threshold of $ 1124632.95
Fuel Surcharge - FedEx has applied a fuel surcharge of 4.75% to this shipment.
Distance Based Pricing, Zone 4
FedEx has audited this shipment for correct packages, weight, and service. Any changes made are reflected in the invoice amount.

781594706008	Dec 18, 2020 11:51 R.RAMINRY	75.0 lbs, 34.0 kgs	USD 1.00	000000000/1530/_	NO REFERENCE INFORMATION	190.69

The Earned Discount for this ship date has been calculated based on a revenue threshold of $ 1124632.95
Fuel Surcharge - FedEx has applied a fuel surcharge of 4.75% to this shipment.
Distance Based Pricing, Zone 4
FedEx has audited this shipment for correct packages, weight, and service. Any changes made are reflected in the invoice amount.

781594706041	Dec 18, 2020 11:51 R.RAMINRY	65.0 lbs, 29.5 kgs	USD 1.00	000000000/1530/_	NO REFERENCE INFORMATION	169.13

The Earned Discount for this ship date has been calculated based on a revenue threshold of $ 1124632.95
Fuel Surcharge - FedEx has applied a fuel surcharge of 4.75% to this shipment.
Distance Based Pricing, Zone 4
FedEx has audited this shipment for correct packages, weight, and service. Any changes made are reflected in the invoice amount.

781594705950	Dec 18, 2020 11:51 R.RAMINRY	30.0 lbs, 13.6 kgs 24.0 lbs, 10.9 kgs	USD 1.00	000000000/1530/_	NO REFERENCE INFORMATION	84.62

The Earned Discount for this ship date has been calculated based on a revenue threshold of $ 1124632.95
Fuel Surcharge - FedEx has applied a fuel surcharge of 4.75% to this shipment.
Distance Based Pricing, Zone 4
FedEx has audited this shipment for correct packages, weight, and service. Any changes made are reflected in the invoice amount.
We calculated your charges based on a dimensional weight of 30.0 lbs, 50 in x 9 in x 9 in, using a dimensional factor of 139.

781594706052	Dec 18, 2020 11:51 R.RAMINRY	75.0 lbs, 34.0 kgs	USD 1.00	000000000/1530/_	NO REFERENCE INFORMATION	190.72

The Earned Discount for this ship date has been calculated based on a revenue threshold of $ 1124632.95
Fuel Surcharge - FedEx has applied a fuel surcharge of 4.75% to this shipment.
Distance Based Pricing, Zone 4
FedEx has audited this shipment for correct packages, weight, and service. Any changes made are reflected in the invoice amount.

Transportation Charge		4188.00
Declared Value Charge		0.00
Fuel Surcharge		81.88
Discount		-2345.28
Earned Discount		-418.80
Additional Handling Charge - Weight		216.00
Additional Handling Charge - Dimensions		30.00
Peak - AHS Charge		53.90
Total Charge	**USD**	**$1,805.70**

Multiweight - Third Party Subtotal	**USD**	**$1,805.70**
Total FedEx Express	**USD**	**$2,044.19**

APPENDIX B

ALTERNATE LINER INVESTIGATION LABORATORY STUDY - BELLE RIVER

BORING NO	SAMPLE NO	Sample Interval (ft bgs)	Shelby Tube Recovery (ft)	Sample Layer	Moisture Content (ASTM D2216)	Grain Size - Sieve (ASTM D6913)	Grain Size - Hydrometer (ASTM D7928)	Specific Gravity (ASTM D854)	Atterberg (ASTM D4318)	Flex. Wall Permeability (ASTM D5084)	Flex. Wall Permeability / COMPATABILITY (ASTM D7100)
1	B-1-ST-1	7-9	Full		1	1	1	1	1	1	1
	B-1-ST-2	19-21	Full		1						
	B-1-ST-3	36-38	1.5	soft	1	1			1	1	
	B-1-ST-4	57-59	1	med. Stiff	1						
	B-1-ST-5	80-82	0.5		1						
	B-1-ST-6	98-100	Full		1						
	B-1-1	3		hard clay	1	1			1		
	B-1-2	6		hard clay	1						
	B-1-3	10		hard clay	1						
	B-1-4	15		very stiff clay	1						
	B-1-5	22		med. Stiff	1						
	B-1-6	25		med. Stiff	1	1			1		
	B-1-7	34		soft	1						
	B-1-8	40		soft	1						
	B-1-9	48		soft	1	1			1		
	B-1-10	52		soft	1						
	B-1-11	59		med. Stiff	1	1			1		
	B-1-12	63		med. Stiff	1						
	B-1-13	74		stiff	1						
	B-1-14	80		stiff	1						
	B-1-15	82		stiff	1						
	B-1-16	85		stiff	1	1			1		
	B-1-17	87		stiff	1						
	B-1-18	94		stiff	1						
2	B-2-ST-1	1-3	Full		1	1	1	1	1	1	1
	B-2-ST-2	7-9	Full		1	1			1	1	
	B-2-ST-3	27-29	Full		1						
	B-2-ST-4	47-49	Full		1	1	1	1	1	1	1
	B-2-ST-5	67-69	Full		1						
	B-2-ST-6	77-79	Full		1						
	B-2-ST-7	97-99	Full		1						
	B-2-1	1		hard clay	1						
	B-2-2	5		hard clay	1	1			1		
	B-2-3	10		hard clay	1						
	B-2-4	12		very stiff clay	1						
	B-2-5	18		very stiff clay	1	1			1		
	B-2-6	24		med. Stiff	1						
	B-2-7	32		soft	1						
	B-2-8	40		soft	1	1			1		
	B-2-9	46		soft	1						

Note: The initial testing program was provided to EGT on December 22, 2020 and completed on March 3, 2021.

ALTERNATE LINER INVESTIGATION LABORATORY STUDY - BELLE RIVER

BORING NO	SAMPLE NO	Sample Interval (ft bgs)	Shelby Tube Recovery (ft)	Sample Layer	Moisture Content (ASTM D2216)	Grain Size - Sieve (ASTM D6913)	Grain Size - Hydrometer (ASTM D7928)	Specific Gravity (ASTM D854)	Atterberg (ASTM D4318)	Flex. Wall Permeability (ASTM D5084)	Flex. Wall Permeability / COMPATABILITY (ASTM D7100)
2	B-2-10	50		soft/stiff	1						
	B-2-11	54		stiff	1						
	B-2-12	60		stiff	1	1			1		
	B-2-13	64		stiff	1						
	B-2-14	70		stiff	1						
	B-2-15	75		stiff	1						
	B-2-16	80		stiff	1	1			1		
	B-2-17	86		stiff	1						
	B-2-18	91		very stiff clay	1						
	B-2-19	96		very stiff clay	1						
3	B-3-ST-1	1-3	Full		1	1			1	1	
	B-3-ST-2	7-9	Full		1						
	B-3-ST-3	27-29	Full		1						
	B-3-ST-4	47-49	Full		1						
	B-3-ST-5	77-79	Full		1	1	1	1	1	1	1
	B-3-ST-6	97-99	Full		1	1			1	1	
	B-3-1	1		gravelly sand	1						
	B-3-2	5		hard clay	1	1			1		
	B-3-3	10		very stiff clay	1						
	B-3-4	15		med. Stiff	1						
	B-3-5	20		med. Stiff	1						
	B-3-6	25		med. Stiff	1	1			1		
	B-3-7	30		med. Stiff	1						
	B-3-8	35		med. Stiff	1						
	B-3-9	40		med. Stiff	1						
	B-3-10	45		med. Stiff	1	1			1		
	B-3-11	50		med. Stiff	1						
	B-3-12	55		med. Stiff	1						
	B-3-13	60		med. Stiff	1						
	B-3-14	67		silty sand	1	1					
	B-3-15	70		silty sand	1						
	B-3-16	75		stiff clay	1						
	B-3-17	80		stiff clay	1						
	B-3-18	85		very stiff clay	1	1			1		
	B-3-19	90		very stiff clay	1						
	B-3-20	95		very stiff clay	1						
4	B-4-ST-1	7-9	Full		1						
	B-4-ST-2	27-29	Full		1						
	B-4-ST-3	47-49	Full		1	1	1	1	1	1	1
	B-4-ST-4	67-69	Full		1	1			1	1	
	B-4-ST-5	87-89	Full		1						

Note: The initial testing program was provided to EGT on December 22, 2020 and completed on March 3, 2021.

ALTERNATE LINER INVESTIGATION LABORATORY STUDY - BELLE RIVER

BORING NO	SAMPLE NO	Sample Interval (ft bgs)	Shelby Tube Recovery (ft)	Sample Layer	Moisture Content (ASTM D2216)	Grain Size - Sieve (ASTM D6913)	Grain Size - Hydrometer (ASTM D7928)	Specific Gravity (ASTM D854)	Atterberg (ASTM D4318)	Flex. Wall Permeability (ASTM D5084)	Flex. Wall Permeability / COMPATABILITY (ASTM D7100)
4	B-4-ST-6	97-99	Full		1						
	B-4-1	10		hard clay	1	1			1		
	B-4-2	12		stiff clay	1						
	B-4-3	15		med. Stiff	1						
	B-4-4	20		med. Stiff	1						
	B-4-5	25		med. Stiff	1						
	B-4-6	30		med. Stiff	1						
	B-4-7	34		silty sand	1	1					
	B-4-8	36		med. Stiff	1						
	B-4-9	40		med. Stiff	1						
	B-4-10	45		med. Stiff	1						
	B-4-11	50		med. Stiff	1						
	B-4-12	55		med. Stiff	1	1			1		
	B-4-13	60		med. Stiff	1						
	B-4-14	65		med. Stiff	1						
	B-4-15	70		med. Stiff	1						
	B-4-16	75		stiff clay	1	1			1		
	B-4-17	80		very stiff clay	1						
	B-4-18	85		very stiff clay	1						
	B-4-19	90		stiff clay	1						
	B-4-20	95		stiff clay	1	1			1		
5	B-5-ST-1	1-3	13"		1						
	B-5-ST-2	27-29	Full		1	1			1	1	
	B-5-ST-3	47-49	Full		1						
	B-5-ST-4	67-69	Full		1						
	B-5-ST-5	87-89	Full		1	1	1	1	1	1	1
	B-5-ST-6	97-99	Full		1						
	B-5-1	7		hard clay	1	1			1		
	B-5-2	14		med. Stiff	1						
	B-5-3	21		med. Stiff	1						
	B-5-4	29		med. Stiff	1	1			1		
	B-5-5	32		stiff	1						
	B-5-6	37		stiff	1						
	B-5-7	42		stiff	1						
	B-5-8	46		stiff	1						
	B-5-9	52		stiff	1	1			1		
	B-5-10	57		stiff	1						
	B-5-11	62		med. Stiff	1						
	B-5-12	66		med. Stiff	1						
	B-5-13	72		stiff	1	1			1		
	B-5-14	77		stiff	1						
	B-5-15	82		stiff	1						

BORING NO	SAMPLE NO	Sample Interval (ft bgs)	Shelby Tube Recovery (ft)	Sample Layer	Moisture Content (ASTM D2216)	Grain Size - Sieve (ASTM D6913)	Grain Size - Hydrometer (ASTM D7928)	Specific Gravity (ASTM D854)	Atterberg (ASTM D4318)	Flex. Wall Permeability (ASTM D5084)	Flex. Wall Permeability / COMPATABILITY (ASTM D7100)
5	B-5-16	86		stiff	1						
	B-5-17	92		very stiff clay	1	1			1		
	B-5-18	96		very stiff clay	1						
	B-5-19	99		very stiff clay	1						
6	B-6-ST-1	1-3	12"		1						
	B-6-ST-2	7-9	Full		1						
	B-6-ST-3	27-29	Full		1						
	B-6-ST-4	47-49	Full		1	1			1	1	
	B-6-ST-5	67-69	Full		1						
	B-6-ST-6	87-89	Full 30"/30"		1						
	B-6-ST-7	97-99	Full 30"/30"		1	1			1	1	
	B-6-1	5		hard clay	1						
	B-6-2	10		hard clay	1						
	B-6-3	15		stiff clay	1	1			1		
	B-6-4	20		med. Stiff	1						
	B-6-5	25		med. Stiff	1						
	B-6-6	30		stiff	1						
	B-6-7	35		med. Stiff	1	1			1		
	B-6-8	40		med. Stiff	1						
	B-6-9	45		med. Stiff	1						
	B-6-10	50		med. Stiff	1						
	B-6-11	55		stiff	1	1			1		
	B-6-12	60		stiff	1						
	B-6-13	65		stiff	1						
	B-6-14	70		stiff	1						
	B-6-15	75		stiff	1	1			1		
	B-6-16	80		stiff	1						
	B-6-17	85		stiff	1						
	B-6-18	90		stiff	1						
	B-6-19	95		stiff	1	1			1		
	B-6-20	99		stiff	1						