



SUSQUEHANNA RIVER BASIN COMMISSION

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Docket No. 20221207

Approval Date: December 15, 2022

MUNICIPAL AUTHORITY OF THE TOWNSHIP OF EAST HEMPFIELD FACILITY: HEMPFIELD WATER AUTHORITY

**Groundwater Withdrawals from
Wells W-1, W-2, W-3, W-4, W-5, W-6, W-7, W-8, and W-11;
Surface Water Withdrawal from Spring S-1;
Southern Source Withdrawal Limit;
and Total System Withdrawal Limit**

Section 1. Approval

After review of the record, including the technical findings of Susquehanna River Basin Commission (Commission) staff, the Commission has determined that significant, long-term, adverse impacts are not anticipated to increase by continued operation of this project as described and conditioned herein, the project is physically feasible and does not conflict with or adversely affect the Commission's Comprehensive Plan. Accordingly, the Commission hereby approves modification and renewal of the project described herein in accordance with the conditions set forth below.

The project sponsor maintains and operates a public water supply system that includes nine groundwater sources (Wells W-1, W-2, W-3, W-4, W-5, W-6, W-7, W-8 and W-11) and one surface water source (Spring S-1), all of which are incorporated into the total system limit. A combined withdrawal limit for the southern sources (Wells W-1, W-2, W-3, W-5, W-8, and W-11 and Spring S-1) is also established as provided below. The project sponsor also maintains an interconnection from the City of Lancaster. The interconnection is not included as a source of water subject to the total system limit. Based on information provided by the project sponsor, no other sources are operated by the project.

The Commission previously approved the project's withdrawals under the following dockets:

1. Commission Docket No. 19870306, approving Wells W-6 and W-7 for a combined withdrawal of 0.403 million gallons per day (mgd);
2. Commission Docket No. 19890503, approving Well W-8 for 1.440 mgd;
3. Commission Docket No. 19930101, approving Well W-11 for 1.656 mgd; and

4. Commission Docket No. 20120906, approving Spring S-1 and Wells W-1, W-2, W-3, W-4, and W-5, and a total system limit of 1.937 mgd, as described below.

The project sponsor completed operational testing of its wells between September 2015 and January 2017. A report containing results of the operational tests was submitted to the Commission on April 10, 2017, that included requested maximum instantaneous and 30-day average withdrawal rates for each source, sub-system limits for several wells, and a total system limit of 4.105 mgd from all sources combined as indicated in the following table. The report and the results contained therein are the basis for staff's recommendations.

Requested Withdrawal Quantities			
Well Name	Maximum Instantaneous Withdrawal Rate (gpm)	Individual 30-Day Average Withdrawal Rate (mgd)	Sub-System Limit (mgd)
W-1	206*	0.297	1.800
W-2	592*	0.852	
W-3	170	0.245	
W-11	1,250*	1.800	
W-5	550	0.792	1.447
W-8	1,005*	1.447	
W-4	250	0.360	0.360
W-6	245**	0.353	0.498
W-7	101**	0.145	
Total System Limit (30-Day Average) (mgd)			4.105
gpm – gallons per minute * Requested rate is higher than the Pennsylvania Department of Environmental Protection (PADEP)-approved rate but no associated application has been submitted to PADEP for an increase. ** Higher than PADEP combined limit of 280 gpm and no associated application has been submitted to PADEP for an increase of individual limits.			

The project sponsor submitted renewal applications for Wells W-6, W-7, and W-8 in accordance with Commission regulations. Because operational testing was completed for all well sources, and to combine all sources under one approval, Commission Docket Nos. 19930101 and 20120906 are superseded with this approval.

This approval increases the total system limit from 1.937 mgd to 2.065 mgd, establishes a combined withdrawal limit for the southern sources (Wells W-1, W-2, W-3, W-5, W-8, and W-11 and Spring S-1), and authorizes withdrawals at the maximum instantaneous and 30-day average withdrawal rates, as provided in the table in Section 5. This approval does not include the four separate sub-system limits requested by the project sponsor because the additional operational complexity added by inclusion of those limits is not necessary to address water availability, resource limitations, or surface water impact concerns. The rates are generally lower than requested because:

1. Commission staff determined that aquifer recharge (excluding surface water and/or base flow capture) within the demonstrated groundwater basin is insufficient to support the requested cumulative withdrawals;
2. Operational testing and a summary report from the project sponsor demonstrated significant surface water impacts; and
3. Requested rates for certain wells exceed rates currently approved by PADEP, and applications for increases to those rates have not been submitted to PADEP.

Approved withdrawal rates are being established to ensure that long-term surface water impacts are not increased above the impacts that have occurred at the maximum historical withdrawal rates.

Commission staff has coordinated with PADEP and the Pennsylvania Fish and Boat Commission (PFBC) during review of this project.

Section 2. Project Information

Information concerning the project sponsor, water use type, and location are set forth in the table below.

Project Information	
Project Sponsor:	Municipal Authority of the Township of East Hempfield
Facility:	Hempfield Water Authority
Approval Types:	Groundwater and Surface Water Withdrawals
Past Docket Nos.:	19870306, 19890503, 19930101, and 20120906
Authorized Water Use Purpose:	Public Water Supply
Municipality:	East Hempfield Township
County:	Lancaster County
State:	Pennsylvania

Section 3. Source Information

Information concerning the sources of water from which the withdrawals will be made is set forth in the tables below.

Groundwater Source Information	
Withdrawal Type:	Groundwater
Approved Sources:	Wells W-1, W-2, W-3, W-4, W-5, W-6, W-7, W-8, and W-11
Subbasin:	Lower Susquehanna River
Watershed Boundary Dataset (WBD):	0205030610 (Little Conestoga Creek)
Withdrawal Location (degrees)*:	Lat: -- Long: --
Special Flow Protection Required:	No
* Specific location information concerning discrete water-related project features has been withheld for security reasons.	

Surface Water Source Information	
Withdrawal Type:	Surface Water
Approved Source:	Spring S-1
Subbasin:	Lower Susquehanna River
Watershed Boundary Dataset (WBD):	0205030610 (Little Conestoga Creek)
Withdrawal Location (degrees)*:	Lat: -- Long: --
Impairment**†:	Nutrients; Siltation; Pathogens
Drainage Area (square miles)†:	2.8
Aquatic Resource Class***†:	1
Special Flow Protection Required:	No
* Specific location information concerning discrete water-related project features has been withheld for security reasons.	
** 2022 Pennsylvania Integrated Water Quality Report	
*** Refer to Commission Policy No. 2012-01 (Low Flow Protection Policy Related to Withdrawal Approvals).	
† Based on the anticipated point of impact to surface water.	

Section 4. Aquifer Testing

The aquifer testing requirement of 18 CFR § 806.12 was met either through prior aquifer testing waivers or with the approval of the operational testing plan submitted in accordance with Special Condition 21 of Commission Docket No. 20120906, which is summarized in Section 4.1 below.

Section 4.1 Commission Docket No. 20120906 Summary

During review of the Well W-5 renewal application, Commission staff identified that operation of previously unapproved sources (Spring S-1 and Wells W-1, W-2, W-3, and W-4) eliminated grandfathering and Commission review and approval of those sources was required. In support of the applications for Wells W-1 through W-5 and Spring S-1, the project sponsor chose to provide historical aquifer testing and operational data, and requested a waiver of the requirement to conduct new aquifer testing, which was granted on September 20, 2012. Commission staff's review determined that the project's 10 sources are within the same

contributing groundwater basin and the sum of the individual sources' previously approved withdrawal limits exceeded the 1-in-10-year drought recharge within the basin (Section 4.3). To address this limitation to water availability, Commission Docket No. 20120906 established individual withdrawal limits for Spring S-1 and Wells W-1, W-2, W-3, W-4, and W-5, and established a total system limit for all of the project's withdrawals (excluding the interconnection) based on historical use. Although historical use exceeded the 1-in-10-year drought recharge, the Commission deviated from its standard practice and approved a higher quantity consistent with the maximum historical use of 1.937 mgd, which occurred one time in August 2006.

The project sponsor disagreed with the Commission's assessment of the resource available to support the project's proposed withdrawals. To address questions raised by the project sponsor, Commission Docket No. 20120906 included a special condition (Condition 21) that required the project sponsor to complete operational testing to further evaluate cumulative effects during operation, potential well interference, sustainability of the desired withdrawals, and the appropriateness of the total system withdrawal limits. Condition 21 of the 2012 docket committed staff to review and develop recommendations and appropriate modifications to the 2012 approval without requiring the project sponsor to submit a modification application or associated review fees.

Section 4.2 Operational Testing

Operational testing was completed in general accordance with the procedures and monitoring network identified in the approved operational testing plan, and the results were submitted in an interpretative report that included requested withdrawal rates as summarized in Section 1. At the project sponsor's discretion, additional wells were included in the operational testing program that were not required by the 2012 docket condition. Testing results and data from those additional wells satisfied hydrogeologic evaluation requirements and were used by staff to complete evaluation of associated renewals.

Operational testing included surface water monitoring which had not been completed during historical aquifer testing or during routine operation of the wells. For the first time, data were collected from surface water monitoring locations and provided to staff for evaluation of surface water impacts resulting from the project's groundwater withdrawals. The operational testing demonstrated that impacts to Swarr Run and the unnamed tributary (UNT) to Swarr Run are occurring during current operations and that impacts at the higher requested withdrawal rates would cause additional, significant adverse impacts to streamflow.

Unfavorable streamflow, precipitation, or aquifer conditions during testing impeded evaluation of surface water impacts for certain wells (e.g., Wells W-5 and W-8).

Section 4.2.1 Wells without Documented Surface Water Impacts

The results of the operational testing demonstrated that two wells (Wells W-4 and W-7) did not directly impact surface water. Because the operational testing did not demonstrate direct

surface water impacts, the rates recommended by Commission staff are consistent with the tested and requested rates.

Section 4.2.2 Significant Adverse Impacts to Surface Water

Operational testing conducted by the project sponsor demonstrated rapid and significant adverse impacts to either Swarr Run or an UNT to Swarr Run by multiple wells, as summarized in the following table:

Measured Surface Water Impacts	
Well Name	Measured Flow Reduction During Testing (gpm)
W-1	121
W-2	167
W-3	44
W-6	133
W-8 ¹	70
W-11	27 ²
¹ Flow reduction during the beginning of Well W-11/Well W-8 test when only Well W-8 was operating and prior to Well W-11 operating.	
² Potential reduction is likely greater but flow was entirely eliminated.	

The streamflow reductions provided in the table above were measured during the short-term operational testing and would be expected to be greater over longer periods of operation. Additionally, long-term operation of the sources at the requested rates is expected to cause additional flow reductions in excess of impacts that are currently occurring at lower average withdrawal rates typically used. Of the 4.105 mgd requested, only 0.505 mgd, or roughly 12 percent, can be obtained from sources with no documented direct surface water impacts (Wells W-4 and W-7). Therefore, staff expects that the remaining 3.600 mgd of the requested total withdrawal quantity would be obtained from sources that are expected to reduce streamflow.

Individual operational tests of Wells W-5 and W-8 were less conclusive regarding surface water impacts due to lack of streamflow during the Well W-5 test or significant precipitation during both the tests for Wells W-5 and W-8. However, Wells W-5 and W-8, which are within 200 feet of the unnamed tributary, are expected to reduce streamflows because of the following:

1. During the initial 72 hours of the combined Well W-8 and Well W-11 test when only Well W-8 was operated, a 70 gpm reduction in streamflow was observed in the UNT to Swarr Run;
2. Testing demonstrated interference between Wells W-5 and W-8; and
3. Rapid water level changes were observed in Wells W-5 and W-8 in response to precipitation.

Swarr Run and the UNT to Swarr Run are impaired and, based on staff's evaluation of the aquatic resource, the documented streamflow reductions are expected to cause additional impairment at the requested rates. Although operational testing indicated that current withdrawals are reducing streamflow, the project is an existing public water supply system that must continue to provide uninterruptable service to the public. In the interest of public safety and human health, and in accordance with the discretion provided in the Commission's 2012 Low Flow Protection Policy, staff does not recommend a passby condition provided that withdrawals and their associated impacts do not exceed current and maximum historical levels.

Section 4.3 Groundwater Availability Analysis

This groundwater availability analysis section is only addressing the insufficiency of groundwater resources to support the requested withdrawals and the resulting need to reduce quantities. Impacts to the environment are described and discussed above, which are additional reasons to reduce the recommended limits from the requested quantities. Staff prepared a groundwater availability analysis that considered a groundwater contributing area based on demonstrated areas of pumping influence from the operational testing, the groundwater contour and drawdown maps provided by the project sponsor, and published groundwater recharge rates for each geologic formation, which ranged from 0.292 mgd to 0.500 mgd per square mile (1-in-10-year drought recharge rates). Because Wells W-1, W-2, W-3, W-5, W-8, and W-11 are near each other in the southern portion of the watershed, staff's analysis grouped the southern wells together and evaluated the northern wells (Wells W-4, W-6, and W-7) separately.

The project sponsor also completed a groundwater availability analysis, and the provided results were significantly different from staff's findings. The project sponsor estimated a contributing groundwater basin of 9.86 square miles for all the wells collectively and an associated groundwater recharge of 5.352 mgd, which must include water from other watersheds and did not consider local over-utilization. By contrast, staff's analysis used a contributing basin of approximately 1.9 square miles for the southern wells and 3.4 square miles for the northern wells. Because testing did not demonstrate that the southern wells could capture water from the contributing basin for the northern wells, or capture water from adjacent topographic watersheds, staff finds inclusion of those areas for the southern wells to be inappropriate. Furthermore, staff utilized published rates for each formation, but the project sponsor used a single rate for the entire area that exceeded the highest published recharge rates. The 1-in-2-year recharge rate used by the project sponsor is approximately twice that of most published rates. A summary of staff's analysis is provided in the following sections.

Section 4.3.1 Northern Wells (Wells W-4, W-6, and W-7)

Sufficient groundwater resources are available to support the requested withdrawals from Wells W-4, W-6, and W-7.

Section 4.3.2 Southern Wells (Wells W-1, W-2, W-3, W-5, W-8, and W-11)

Staff's analysis identified groundwater utilization of approximately 450 percent of the 1-in-10-year drought recharge at the requested rates for the southern wells near the headwaters for the UNT to Swarr Run. Staff first followed the standard approach of identifying a contributing groundwater basin based on topography. Staff then used the data and results of the operational testing completed by the project sponsor to evaluate and identify if there were appropriate adjustments that should be made to the delineated groundwater basin. However, all of the drawdown and groundwater contour maps provided by the project sponsor depict groundwater flow aligning with the topographic basins; therefore, adjustments to staff's delineated contributing basin were not appropriate. Staff estimated that the contributing groundwater basin for the southern wells is approximately 1.9 square miles and, using published recharge rates, calculated an associated groundwater availability of approximately 0.720 mgd, which is significantly less than the quantity requested from the southern wells (3.247 mgd). Overall, the analysis indicates that insufficient groundwater resources are available to support the requested quantities from the southern wells without significant adverse impacts.

The Commission's standard practice would reduce withdrawals from the southern wells to be consistent with the 1-in-10-year groundwater availability of 0.720 mgd. However, staff recommends deviating from standard practice to support the public water supply system and recognizes that the wells have been in use for many years, and potable water is needed to protect public safety and human health and support economic development. Therefore, staff recommends a southern source withdrawal limit of 1.422 mgd (30-day average), which includes Spring S-1 and the southern wells, based on the combined maximum observed withdrawal from these sources, which occurred in January 2017, to help ensure that long-term impacts to surface water are limited to no more than what has previously occurred.

In addition to the groundwater availability analysis described above, staff evaluated operational testing recovery data and residual drawdown analyses to determine if the requested withdrawal rates were sustainable or if they exceeded groundwater availability. The residual drawdown analysis provided by the project sponsor included the following statement for Wells W-8 and W-11: "S/S' <1, which indicates the presence of a no-flow boundary (e.g., compartmentalized flow and incomplete recovery)." The residual drawdown analysis, specifically the excessive duration needed for recovery, indicated a limited aquifer near Wells W-8 and W-11, especially when surface water flow or base flow discharge is low, which could result in a permanent lowering of the static water level.

Section 4.4 Projected Demand

Because the project sponsor indicates a projected demand that exceeds the combined withdrawal limit for all of its current sources (excluding the interconnection), staff recommends voluntary development and implementation of a water resource development plan, in accordance with Special Condition 20 below. At the request of the project sponsor, Commission staff has provided mapping to assist in identifying potential areas for exploration and development of wells outside the current groundwater recharge area and will be available to provide further

technical assistance, if requested. In accordance with Special Condition 21, the total system withdrawal limit and projected demand would be reevaluated during review of any groundwater withdrawal application(s) for new source(s) that may be developed in response to Special Condition 20.

Additionally, Commission staff determined that the withdrawal rates specified in Section 5 should not result in any long-term increase in permanent loss of aquifer storage, render competing supplies unreliable, or cause long-term increase of adverse impacts to the water resources of the basin.

Section 5. Approved Withdrawal Quantities and Limitations

The withdrawals approved hereunder are subject to the quantitative limits and restrictions set forth in the table below.

Withdrawal Quantities and Limitations			
Source	30-Day Average Withdrawal (mgd)	Maximum Instantaneous Withdrawal Rate (gpm)	Southern Source* Withdrawal Limit (30-day average) (mgd)
W-1	0.119	200	1.422
W-2	0.355	550	
W-3	0.108	200	
W-5	0.355	550	
W-8	0.746	1,000	
W-11	1.033	1,150	
Spring S-1	0.070	70	
W-4	0.360	250	Not Applicable
W-6	0.138	280	Not Applicable
W-7	0.145		
Total System Withdrawal Limit – Wells W-1, W-2, W-3, W-4, W-5, W-6, W-7, W-8, and W-11 and Spring S-1 (30-Day Average) (mgd)			2.065
* Wells W-1, W-2, W-3, W-5, W-8, and W-11 and Spring S-1			

The withdrawals are also subject to all other conditions set forth in this docket approval.

Section 6. Existing Approved Withdrawals

The project does not have any other existing approved withdrawals.

Section 7. Grandfathering Determination – Withdrawals

All withdrawals used by the project have Commission approval.

Section 8. Standard Conditions

1. The project sponsor shall comply with all Commission regulations, 18 CFR Parts 801, 806, and 808. This project is subject to the Annual Compliance and Monitoring fee as specified in the Commission's Regulatory Program Fee Schedule, which may be modified over the term of the approval.

2. The project sponsor shall adhere to the metering plan reviewed and approved by Commission staff. Any modifications proposed for the metering plan shall be submitted for review and, if appropriate, approval by Commission staff in accordance with 18 CFR § 806.30. Modifications shall not be made until the project sponsor receives written approval of the amended plan.

3. The project sponsor shall maintain the totalizing meter and other flow and volume measuring devices, accurate to within five (5) percent, so as to provide an accurate record of withdrawals, and certify to the Commission once every five (5) years, or as otherwise requested, the accuracy of all measuring devices and methods to within five (5) percent of actual flow.

4. The project sponsor shall adhere to the groundwater elevation monitoring plan reviewed and approved by Commission staff for the sources listed in Section 3. The project sponsor shall maintain and monitor the accuracy of the measuring devices in accordance with the manufacturer's specifications.

5. The project sponsor shall keep daily records of the project's withdrawals and groundwater elevations for the sources listed in Section 3, and shall report the data to the Commission quarterly, and as otherwise required, in the form and manner as prescribed by Commission staff. Quarterly monitoring reports shall be submitted online and are due within thirty (30) days after the close of the preceding quarter. Any alternative measuring, monitoring, or accounting procedure, and any modifications proposed for the groundwater elevation monitoring plan, shall be submitted for review and approval by Commission staff in accordance with 18 CFR § 806.30. Modifications shall not be made until the project sponsor receives written approval of the amended plan. All data collected and submitted as required under this approval shall be maintained by the project sponsor for the duration of the approval and all subsequent renewals.

6. The project sponsor or any other person representing the project sponsor shall allow authorized employees or agents of the Commission, without advance notice, at any reasonable time and upon presentation of appropriate credentials, and without delay, to have access to and to inspect all areas where the project is being constructed, operated, or maintained, or otherwise exercise all investigative powers authorized under 18 CFR § 808.12.

7. In accordance with 18 CFR § 806.30(b)(2), the project sponsor shall report violations of any withdrawal limits and any conditions of this approval within five (5) days of such violation or report loss of measuring or recording capabilities required under 18 CFR § 806.30(a)(1) within five (5) days after any such loss.

8. In accordance with 18 CFR § 806.6, if ownership of the project changes or if the project sponsor undergoes a name change, the project sponsor shall submit application for transfer or reissuance of all approvals to the Commission within ninety (90) days of the change in ownership or project sponsor name change.

9. The project sponsor shall comply with the water conservation requirements specified in 18 CFR § 806.25.

10. This approval is conditioned on the project sponsor maintaining legal access to the withdrawal locations for the duration of the approval.

11. The project sponsor shall register with the appropriate agency all surface water and groundwater sources described herein, as may be required by regulations of the member jurisdiction.

12. If the project sponsor fails to comply with the provisions of the Susquehanna River Basin Compact or any rule, regulation, or order of the Commission, or any term or condition of this docket, the project sponsor is subject to enforcement actions pursuant to 18 CFR Part 808.

13. Commission approval shall not be construed to exempt the project sponsor from obtaining and maintaining all necessary permits and/or approvals required for the project from other federal, state, or local government agencies having jurisdiction over the project. All such permits and/or approvals shall be obtained prior to the withdrawal of water. The Commission may modify, suspend, or revoke this approval if the project sponsor fails to obtain or maintain such permits and/or approvals.

14. The Commission may at any time reopen any project approval or issue such additional orders, as may be necessary, to mitigate or avoid adverse impacts or otherwise to protect public health, safety, welfare, or the environment, pursuant to 18 CFR § 806.32.

15. Commission approval confers no property rights upon the project sponsor. The securing of all rights necessary and incident to the project sponsor's development and operation of the project shall be the sole and exclusive responsibility of the project sponsor, and this approval shall be subject thereto.

16. This project is approved for inclusion in the Commission's Comprehensive Plan for the Water Resources of the Susquehanna River Basin.

17. The project sponsor is required to apply for and obtain approval prior to any increase in withdrawal that would exceed the amounts listed herein.

18. The project sponsor is required to apply for and obtain approval prior to any increase in the total system withdrawal that would exceed the approved total system withdrawal limits listed herein.

19. If the Commission determines that the operation of the project's groundwater withdrawals adversely affects any existing groundwater or surface water withdrawal, the project sponsor shall be required to provide, at its expense, an alternate water supply or other mitigating measure.

Section 9. Special Conditions

20. Because the project sponsor has maintained that future demand projections for the 15-year approval term are significantly greater than projections completed by staff, and their projection exceeds the total system limit established herein, the project sponsor should consider developing and implementing a water resource development plan to evaluate and develop additional capacity to support the public water supply system and projected demand.

21. Commission staff will evaluate newly developed sources and consider appropriate adjustments to the total system limit established herein with Commission approval of new source(s). New sources should be sited and developed to avoid additional impacts to the surface water within the currently impacted Swarr Run drainage area and be demonstrated to have adequate groundwater recharge availability. Increases to the total system limit established herein, if appropriate, would be provided in approval(s) of additional sources.

22. The last meter certifications were performed between November 8 and 11, 2021; therefore, the next meter certifications are due no later than November 8, 2026. Certification of meter accuracy shall be provided to the Commission no less frequent than once every five (5) years from the date of the last certification.

23. The project sponsor shall keep records, and shall report the same to the Commission upon request, of all persons supplied water from the project that maintain a permanent connection to the public water supply system. The project sponsor shall also keep daily records, and shall report the same to the Commission upon request, of all persons supplied water from the project that do not maintain a permanent connection to the public water supply system, including daily quantities supplied.

Section 10. Term

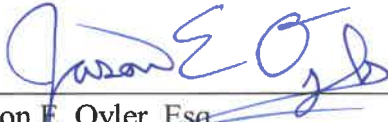
24. This approval shall be effective January 1, 2023, and shall remain effective until December 31, 2037. As specified in 18 CFR § 806.31(e), if the project sponsor submits an application on or before June 30, 2037, the project sponsor may continue operation of this project pursuant to the terms and conditions of this approval until such time as the Commission acts on such application, or until otherwise notified by the Executive Director.

25. Commission Docket Nos. 19870306 and 19890503 shall remain effective through December 31, 2022, whereupon they shall expire.

26. Commission Docket Nos. 19930101 and 20120906 are hereby superseded, effective December 31, 2022.

CERTIFICATION: I, Jason E. Oyler, Secretary to the Susquehanna River Basin Commission, do hereby certify that the foregoing project docket was approved by the Susquehanna River Basin Commission on December 15, 2022.

Dated: December 16, 2022



Jason E. Oyler, Esq.