

Waiver and Variance

Section 1 – General Details:

This waiver and variance is granted in accordance with the provisions of the Rules of the Texana Groundwater Conservation District (the District) and acceptance of this waiver and variance constitutes an acknowledgment and agreement that the applicant, well operator, and well owner will comply with the terms and conditions of this waiver and variance and the Rules of the District not affected by this waiver and variance.

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| Waiver and Variance ID: | WV-20191219-01 |
| Permitted Entity: | Ekstrom Aquaculture, LLC |
| Applicant Name: | James P. Ekstrom, President |
| Applicant Address: | 1205 Frank Stubbs Dr., El Campo, Texas 77437 |
| Waiver Application ID: | AWV-20190307-01 |
| Associated Permit Applications: | ADW-20190306-01, ADW-20190306-02, ADW-20190306-03, ADW-20190306-04, ADW-20190306-05, ADW-20190306-06, ADW-20190306-07, AOWF-20190304-03 |
| Associated Permits: | <p>Existing Production Permits:¹ VP-20121115-01, VP-20121203-01, VP-20121203-02, VP-20121203-03, VP-20121203-04, VP-20121203-05, VP-20121203-06, VP-20121203-07, AP-201203-14, VPW-20191219-01</p> <p>Drilling Permits: DP-20191219-01, DP-20191219-02, DP-20191219-03, DP-20191219-04, DP-20191219-05, DP-20191219-06, DP-20191219-07; and</p> <p>Production Permit: OPWF-20191219-01.</p> |
| Associated District Rules: | <p>Item 12 of Rule 4.2 (Required information for an application for a drilling permit);</p> <p>Items 9 and 10 of Rule 4.3 (Required information for an application for a production permit);</p> <p>Item 13 of Rule 4.3 (Production Permit Conditions);</p> <p>Item 4 of Rule 4.11 (Attempts to obtain adjacent landowner waivers).</p> <p>Item 1 of Rule 5.2 (Well Separation Requirement for Well Fields); Item 3 of Rule 6.4 (1/2 AFYA Limitation).</p> |

¹ These existing production permits shall remain in effect independent of this waiver and variance, and those requiring renewal are deemed renewed without changes; but production of the wells is governed by this waiver and variance and any conflicting permit terms are suspended in favor of this waiver and variance once production begins under OPWF-20191219-01, unless Permitted Entity surrenders this waiver and variance to the District.

This waiver is conditioned upon the well operator and well owners otherwise complying with the Rules of the District and regulations of the State of Texas, as amended, applicable to operating water wells within the District. This waiver confers only the right to use the subject wells under the provisions of the Rules of the District and according to the terms of this waiver and variance. The waiver and variance term and conditions may be modified or amended pursuant to the Rules of the District. This waiver is conditioned upon the Permitted Entity and its successors maintaining ownership of the contiguous tract of land associated with the well field.

Section 2 - Finding of Good Cause by the Board of Directors of the District:

The Board of Directors finds good cause to waive item 12 of Rule 4.2, items 9 and 10 of Rule 4.3, item 13 of Rule 4.3, item 4 of Rule 4.11, item 1 of Rule 5.2, and item 3 of Rule 6.4 and to authorize production in accordance with the terms of this waiver and variance. The basis of the finding of good cause to grant this waiver is the authorization of production of groundwater of lower quality from wells drilled in close proximity to the Carancahua Bay and completed in surficial water strata generally known to produce poor-quality groundwater with total dissolved solids typically in excess of 5,000 mg/L will likely 1) reduce future demand for high-quality groundwater found in deeper water strata in vicinity of the well field site, 2) reduce the negative impacts associated with production of groundwater on higher quality groundwater in the vicinity of the well field site in deeper water bearing strata, and 3) produce valuable empirical data regarding the development of shallow, brackish groundwater resources near the coast line within the District.

Section 3 - Waiver and Variance Granted:

The Board of Directors grants the following waivers and variances subject to the condition established herein:

1. waive the requirements, established under item 12 of Rule 4.2 and items 9 and 10 of Rule 4.3, to submit technical data with drilling and production permit applications and allow the data within the reports titled *Associated Permitting Applications to the report Assessment of Proposed Groundwater Production at Ekstrom Aquaculture LLC Expansion Project* authored by Venkatesh Uddameri, Ph.D., P.E., and *Assessment of Proposed Groundwater Production at Ekstrom Aquaculture LLC Expansion Project - Additional Simulations and Water Quality Analysis* authored by Venkatesh Uddameri, Ph.D., P.E. to suffice for such purposes;
2. waive the requirement, established under item 4 under Rule 4.11 for the applicant to attempt to obtain the waivers and identifying any required waivers that were not obtained and reason the waiver was not obtained in instances in which the rules of the District allow for exceptions contingent on waiver by adjoining or adjacent landowners;
3. waive the requirement, established under item 1 of Rule 5.2, to prohibit the placement of wells of a non-grandfathered well field closer than one foot per every one gallon-per-minute to wells not owned by the Permitted Entity and authorize the drilling of the proposed wells at locations within the contiguous acreage owned or controlled by the Permitted Entity at the tract of land encompassing the well field;
4. waive the requirement, established under item 3 of Rule 6.4, to limit production of groundwater from the subject well field, comprised of existing grandfathered wells with historic-use production permits, existing non-grandfathered wells with non-historic-use

- production permits, and proposed non-grandfathered wells, to a rate that does not exceed one-half acre foot per year per contiguous surface acre owned or controlled by the Permitted Entity at the tract of land encompassing the well field;
5. waive the performance standards established under item 13 of Rule 4.3 on the condition that the performance standards established in this waiver and variance shall apply;
 6. authorize the production of groundwater from the subject well field at a rate not to exceed 5,884 acre-feet per year; and
 7. authorize the production of groundwater from the subject well field at a rate not to exceed 9,210 gallons per minute.

Section 4 - Definitions:

The Board of Directors establishes the following definitions as part of this waiver:

1. **Non-grandfathered Brackish Well (NBW)** means a non-grandfathered well operated to produce brackish groundwater.
2. **Aquifer Monitoring Site (AMS)** means an area located on the contiguous property on which the subject well field is located and is designated as an aquifer monitoring site at which monitoring wells shall be established and aquifer monitoring activities shall be conducted.
3. **Dedicated Aquifer Monitoring Well (DAMW)** means a water well located within an AMS dedicated to and used solely for aquifer monitoring purposes.
4. **Upper Brackish - Dedicated Aquifer Monitoring Well (UB-DAMW)** means a DAMW constructed with a well screen isolated by a positive displacement seal within the groundwater zone from which NBWs will produce brackish groundwater.
5. **Lower Fresh - Dedicated Aquifer Monitoring Well (LF-DAMW)** means a DAMW constructed with a well screen isolated by a positive displacement seal within the groundwater zone with fresh water located below the zone from which NBWs will produce brackish groundwater.
6. **Initial Condition Evaluation Period (ICEP)** means the 10-day period of suspended groundwater production by the Permitted Entity during which the initial aquifer conditions at the well site shall be established.
7. **Initial Water Level Condition (IWLC)** means the average water level depth, as the measurement of water level depth below the surface, observed in a DAMW during the final 3-day period of the ICEP.
8. **Annual Drawdown Adjustment Factor (ADAF)** means the amount of drawdown in feet, as calculated by the District, based on observations of water level depths below the surface in wells in (a) the "Upper Brackish" groundwater zone, as described in 4., above, and (b) in the "Lower Fresh" groundwater zone, as described in 5., above, within a 5 mile radius of the subject well field attributed to causes other than the groundwater production by Permitted Entity at the end of a particular calendar year relative to IWLC.
9. **Adjusted Water Level Condition (AWLC)** means the increased water level depth below the surface for a particular calendar year determined by increasing the depth calculated for the IWLC by the ADAF.
10. **Average Water Level (AVG-WL)** means the average value of all water level depth measurements collected, at regular intervals, from a DAMW for a period of time.

11. **Initial Water Quality Condition (IWQC)** means the initial water quality conditions, as temperature-corrected, specific conductivity measurements in $\mu\text{S}/\text{cm}$ units, observed in a DAMW during the final 3-day period of the ICEP.
12. **Average Conductivity (AVG-COND)** means the average value of all temperature-corrected, specific conductivity measurements, in $\mu\text{S}/\text{cm}$ units, collected, at regular intervals, from a DAMW for a period of time.
13. **Produced Groundwater (PGW)** means the volume, in gallons, of groundwater produced from a well or set of wells of the subject well field during a specific reporting period.
14. **Produced Groundwater in Acre-Feet (PGW-AF)** means the volume, in acre-feet, of groundwater produced from a well or set of wells of the subject well field during a specific reporting period, calculated by dividing the PGW by 325,851.
15. **Produced Groundwater Year-to-Date (PGW-YTD)** means the volume, in gallons, of groundwater produced from a well or set of wells of the subject well field from January 1 of the report year to the end of the reporting period.
16. **Produced Groundwater Year-to-Date in Acre-Feet (PGW-YTD-AF)** means the volume, in acre-feet, of groundwater produced from a well or set of wells of the subject well field from January 1 of the report year to the end of the reporting period, calculated by dividing the PGW-YTD by 325,851.
17. **Average Water Level Difference (AVG-WL-DIFF)** means the difference between the AVG-WL calculated for IWLCs and the AVG-WL calculated for a report period.
18. **Average Conductivity Difference (AVG-COND-DIFF)** means the difference between the AVG-COND calculated for the IWQCs and the AVG-COND calculated for a report period.

Section 5 – Conditions and Requirements

The Board of Directors establishes the following conditions and requirements, in addition to those requirements established by the Rules of the District not affected by this waiver and variance, in conjunction with granting this waiver.

Section 5.1 – New Brackish Well Construction Requirements

The following conditions and requirements related to drilling and construction are established for the new NBWs operated under permit OPWF-20191219-01:

1. NBWs shall not be drilled to a depth that exceeds 220 feet below the surface of the ground;
2. NBWs shall not be drilled closer than fifty feet to the nearest property line; and
3. NBWs shall be constructed in a manner to facilitate the collection of water level measurements using a steel tape and water samples directly from the well head.

Section 5.2 – Groundwater Production Limitations

The following conditions and requirements related to groundwater production are established for the water wells operated under production permit OPWF-20191219-01:

1. Groundwater produced from the wells of the subject well field shall be used solely for agricultural purposes;

2. Groundwater shall not be produced from the grandfathered wells of the subject well field at gallons per minute rates that exceed the gallons per minute production rate identified within the historic use production permits associated with a specific grandfathered well of the well field; and
3. Groundwater production from any NBW shall not exceed 350 gallons per minute.

Section 5.3 – Groundwater Production Monitoring and Reporting Requirements

The following conditions and requirements related to groundwater production monitoring and reporting are established for the water wells operated under production permit OPWF-20191219-01:

1. Groundwater production from each well of the subject well field shall be measured by calibrated flow meters.
2. Flow meters used to measure flow of groundwater shall be re-calibrated at least every 5 years.
3. Monthly groundwater production volumes from each well of the subject well field shall be recorded and reported to the District on a monthly basis.
4. Groundwater production measurements from the wells of the subject well field shall be reported to the District within 15 days following the end of each monthly monitoring period.
5. Groundwater production measurements shall be reported in a machine-readable format approved by the District.

Section 5.4 – Aquifer Monitoring and Reporting Requirements

The following conditions and requirements related to aquifer monitoring and reporting are established for the well field operated under production permit OPWF-20191219-01:

1. AMSs shall be established by the Permitted Entity on the well filed site within 300 feet for the following locations:
 - a. West-AMS: 28°41'6.266"N, 96°23'23.006"W;
 - b. Center-AMS: 28°41'08.8"N, 96°22'24.5"W; and
 - c. East-AMS: 28°41'9.856"N, 96°21'25.286"W.
2. A UB-DAMW shall be constructed at each AMS.
3. A LF-DAMW shall be constructed at each AMS.
4. Each DAMW shall be maintained by the Permitted Entity for the term of this waiver.
5. The District shall install and maintain, at the expense of the District, monitoring equipment including water level measurement probes and water conductivity probes at each DAMW.
6. Each DAMW shall be accessible to the District for the purpose of measuring aquifer conditions and installation of aquifer monitoring probes with reasonable advance notice to the Permitted Entity.
7. Water level measurements and conductivity measurements made and recorded by the District shall be used and, if determined to be appropriate by the District, substituted for corresponding, i.e. the same location, date, and time, measurements to be made and recorded by the Permitted Entity.
8. Each UB-DAMW shall have hourly water level measured and recorded by the District. These measurements can be made using a manufacturer-calibrated transducer.

9. Each UB-DAMW shall have water level, temperature, and specific conductivity measured and recorded routinely on a no-less-than weekly-basis by the Permitted Entity. These measurements can be made using a manufacturer-calibrated transducer.
10. Each LF-DAMW shall have water level, temperature, and specific conductivity measured and recorded routinely on a no-less-than weekly-basis by the Permitted Entity. These measurements can be made using a manufacturer-calibrated transducer.
11. The aquifer measurements collected during each monthly monitoring period by the Permitted Entity from the DAMWs shall be reported to the District within 15 days of the end of each monthly monitoring period.
12. The aquifer measurements shall be reported by the Permitted Entity in a machine-readable format approved by the District.
13. The aquifer measurements collected during each monthly monitoring period by the District from the DAMWs shall be reported to the Permitted Entity within 15 days of the end of each monthly monitoring period.
14. The aquifer measurements shall be reported by the District in a machine-readable format.

Section 5.5 – Aquifer Monitoring Data Evaluation Requirements

The following conditions and requirements related to aquifer monitoring data evaluation are established for the well field to be operated under production permit OPWF-20191219-01:

1. IWLCs shall be calculated by the District for each DAMW prior to operation of any of the subject wells under permit OPWF-20191219-01;
2. IWLCs for each DAMW shall be calculated as:
 - a. the AVG-WL for the measurements collected by the District from the DAMW during a 3-day duration observation period occurring before commencement of operations under OPWF-20191219-01; and
3. The water level measurements collected by the District to calculate the IWLCs shall be collected during a time period during which groundwater production from other wells owned or controlled by Permitted Entity is suspended and was suspended for the preceding 7-day period.
4. IWQCs shall be calculated by the District for each DAMW prior to operation of any of the subject wells under permit OPWF-20191219-01.
5. IWQCs for each DAMW shall be calculated as:
 - a. the AVG-COND for the measurements collected by the District from the DAMW during the same 3-day duration observation period occurring before commencement of operations under OPWF-20191219-01 as was observed for the IWLC calculation; and
6. The water quality measurements collected by the District to calculate the IWQCs shall be collected during the same time period during which groundwater production from other wells owned or controlled by Permitted Entity is suspended and was suspended for the preceding 7-day period as was observed for IWLC calculation.
7. For each monthly reporting period, the following parameters shall be calculated and reported for each well of the well field by the Permitted Entity:
 - a. PGW;
 - b. PGW-AF;
 - c. PGW-YTD; and

- d. PGW-YTD-AF.
- 8. For each monthly reporting period, the following parameters shall be calculated and reported for both the current and previous monthly reporting period for each DAMW of the well field by the Permitted Entity:
 - a. AVG-WL;
 - b. AVG-COND;
 - c. AVG-WL-DIFF; and
 - d. AVG-COND-DIFF.

Section 5.6 – Well Field Monitoring Performance Criteria

The following conditions and requirements are established as performance criteria to demonstrate the compliance with production permit OPWF-20191219-01 regarding well field monitoring:

1. the monitoring data related to groundwater production collected and reported by the Permitted Entity shall not have data gaps that constitute more than 5% of the total prescribed measurements per production well during a year;
2. the monitoring data related to water level measurements collected and reported by the Permitted Entity shall not have data gaps that constitute more than 5% of the total prescribed measurements per monitoring well during a year; and
3. the monitoring data related to water quality measurements collected and reported by the Permitted Entity shall not have data gaps that constitute more than 5% of the total prescribed measurements per monitoring well during a year.

Section 5.7 – Groundwater Production Performance Criteria

The following conditions and requirements are established as performance criteria to demonstrate the compliance with production permit OPWF-20191219-01 regarding groundwater production:

1. the PGW-YTD-AF for the well field shall not exceed the aggregate volume of groundwater production authorized by the District under production permits associated with water wells within the well field.

Section 5.8 – Groundwater Level Performance Criteria

The following conditions and requirements are established as performance criteria to demonstrate the compliance with production permit OPWF-20191219-01 regarding groundwater water levels:

1. the AVG-WL, during a reporting period, shall not be more than 10 feet lower in depth than the AWLC for any LF-DAMW; and
2. the AVG-WL, during a reporting period, shall not be more than 15 feet lower in depth than the AWLC for any UB-DAMW.

Section 5.9 – Groundwater Quality Performance Criteria

The following conditions and requirements are established as performance criteria to demonstrate the compliance with production permit OPWF-20191219-01 regarding groundwater quality:

1. Limits of Acceptable Initial Conditions:

- a. the AVG-COND calculated for the IWQCs for any LF-DAMW shall not be greater than 2,600 $\mu\text{S}/\text{cm}$;
 - b. the AVG-COND calculated for the IWQCs for any UB-DAMW shall not be less than 7,000 $\mu\text{S}/\text{cm}$; and
 - c. the AVG-COND calculated for the IWQCs for any UB-DAMW shall not be greater than 28,000 $\mu\text{S}/\text{cm}$.
2. Limits of Acceptable Impact Calculated during Reporting Period:
 - a. the AVG-COND calculated for any LF-DAMW during the reporting period shall not be greater than 110 percent of the corresponding AVG-COND of the IWQCs; and
 - b. the AVG-COND for any UB-DAMW during the reporting period shall not exceed 33,000 $\mu\text{S}/\text{cm}$.

Section 5.10 – Brackish Zone Performance Responses

The following conditions and requirements as performance responses are established for the brackish well field zone to be operated under production permit OPWF-20191219-01:

1. In the event that the groundwater quality performance criteria related to limits of acceptable initial conditions of DAMWs are not achieved, groundwater production from the new NBWs under OPWF-20191219-01 is prohibited until performance is achieved.
2. In the event that any performance criteria are not satisfied during two consecutive reporting periods, groundwater production from wells of the subject well field zone during the next reporting period shall be curtailed to 75 percent of the PGW of the most recent reporting period.
3. Should curtailment be required due to failure to meet the performance criteria as outlined in this section but be met during the reporting period following curtailment, the curtailment shall be reduced by 25 percent of the total initial curtailment amount for the next reporting period and each reporting period thereafter until production has been restored to the PGW of the reporting period previous to the curtailment at which point the curtailment shall be deemed terminated.
4. In the event that any performance criteria are not satisfied during two consecutive reporting periods and the Permitted Entity includes with its report a statement identifying the circumstances which caused the performance criteria exceedance, the General Manager shall review the Permitted Entity's statement. The General Manager may waive or reduce the performance responses described in this section if the Permitted Entity makes a scientifically-credible showing that the exceedance was caused by conditions outside the Permitted Entity's reasonable control, including *force majeure*. *Force majeure* is (a) an act of God; (b) flood, drought, fire, earthquake, hurricane, storm surge, or explosion; (c) war, invasion, hostilities (whether war is declared or not), terrorist threats or acts, riot, or other civil unrest; (d) action by any governmental authority, including an order or law. The Permitted Entity shall be deemed on notice of potential curtailment for any failure to meet the reporting criteria in two consecutive reporting periods.
5. In the event that any performance criteria are not satisfied for more than two consecutive reporting periods, and the General Manager determines that such exceedance was not caused by factors outside the Permitted Entity's reasonable control, groundwater production from wells of the subject well field zone during the next reporting period shall be curtailed to 75 percent of the PGW of the most recent reporting period.

Section 5.11 – Fresh Zone Performance Responses

The following conditions and requirements as performance responses are established for the fresh water well field zone to be operated under production permit OPWF-20191219-01:

1. In the event that any performance criteria are not satisfied during two consecutive reporting periods, groundwater production from wells of the subject well field zone during the next reporting period shall be curtailed to 75 percent of the PGW of the most recent reporting period.
2. In the event that any performance criteria are not satisfied during two consecutive reporting periods and the Permitted Entity includes with its report a statement identifying the circumstances which caused the performance criteria exceedance, the General Manager shall review the Permitted Entity's statement. The General Manager may waive or reduce the performance responses described in this section if the Permitted Entity makes a scientifically-credible showing that the exceedance was caused by conditions outside the Permitted Entity's reasonable control, including *force majeure*. *Force majeure* is (a) an act of God; (b) flood, drought, fire, earthquake, hurricane, storm surge, or explosion; (c) war, invasion, hostilities (whether war is declared or not), terrorist threats or acts, riot, or other civil unrest; (d) action by any governmental authority, including an order or law. The Permitted Entity shall be deemed on notice of potential curtailment for any failure to meet the reporting criteria in two consecutive reporting periods.
3. Should curtailment be required due to failure to meet the performance criteria as outlined in this section but be met during the reporting period following curtailment, the curtailment shall be reduced by 25 percent of the total initial curtailment amount for the next reporting period and each reporting period thereafter until production has been restored to the PGW of the reporting period previous to the curtailment at which point the curtailment shall be deemed terminated.
4. In the event that any performance criteria are not satisfied for more than two consecutive reporting periods, and the General Manager determines that such exceedance was not caused by factors outside the Permitted Entity's reasonable control, groundwater production from wells of the subject well field zone during the next reporting period shall be curtailed to 75 percent of the PGW of the most recent reporting period.

Section 5.12 – Failure to Comply with Required Responses

The following conditions and requirements related to failure to comply with performance responses are established for the well field to be operated under production permit OPWF-20191219-01:

1. In the event that groundwater production from the wells of the subject well field is not curtailed as required under this waiver, groundwater production from the wells of the subject well field shall be terminated until all enforcement proceedings have concluded.

Section 5.13 – Successful Compliance with Performance Criteria

On or after the date three years after the Permitted Entity first operates under permit OPWF-20191219-01, if the performance criteria herein have been satisfied, the Permitted Entity may

request that monthly reporting and response periods be adjusted to longer periods as reasonably supported by the groundwater production data and monitoring data.

Authorization

On DEC. 19, 2019, the Board of Directors approved a motion instructing the General Manager to issue the waiver and variance request as described above.



Tim Andruss, General Manager

Date 12/19/19

Waiver and Variance Acceptance



James P. Ekstrom, President of Ekstrom Aquaculture, LLC

Date 12/19/19