



PUBLIC NOTICE

Date posted: 9/9/2024

DEQ Requests Comments and Hosts Public Hearing on Proposed Water Quality Permit Modification for the Port of Morrow

HOW TO PROVIDE PUBLIC COMMENT

Facility name: Port of Morrow

Permit type: Industrial Water Pollution Control
Facilities Permit

Hearing details: Wednesday, Oct. 9, 2024 at
6 p.m.,
Riverside Junior/Senior High School Library,
210 Boardman Ave NE, Boardman, OR 97818

Virtually:
<https://ordeq.org/POMPermitModPublicHearing>

Toll-free 833-548-0282

Meeting ID: 837 5331 1613

Passcode: 589347

Send written comments to:

By mail: Permit Coordinator, Oregon DEQ,
800 SE Emigrant Ave., Ste 330 Pendleton OR 97801

By email: Water.PermitER@deq.oregon.gov

Comments due by: Friday, Oct. 11, 2024 at 5 p.m.

The Oregon Department of Environmental Quality invites the public to provide written comments or attend a public hearing to provide verbal comments on the Port of Morrow's proposed water quality permit modification, known officially as a Water Pollution Control Facilities permit. The permit modification is necessary to make changes to permit language including non-growing season irrigation management requirements, timelines for the additions of both wastewater treatment and storage, and for a proposed land application area expansion. A copy of the permit modification request documents and technical information describing the basis and rationale for the modifications are included in the draft permit package.

Summary

The permit allows the Port of Morrow to operate an industrial wastewater treatment facility consisting of a collection system, wastewater treatment infrastructure, storage ponds, and land application of wastewater for crop uptake. The port may operate only in accordance with the permit and a DEQ approved Operations, Monitoring and Management Plan. Operations occur in Morrow and Umatilla counties.

DEQ modified the permit in November 2022 requiring a compliance schedule to add primary wastewater treatment via anaerobic digesters, to design and construct secondary wastewater treatment, and to design and construct additional lined lagoons to cease winter disposal of wastewater. Cessation of winter irrigation, improved monitoring and reporting for more precise irrigation management, and wastewater treatment and storage are key enhancements required for the port to protect groundwater from its land application operations.

Translation or other formats

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This modification has been proposed by the port and reviewed by DEQ to enhance protection of groundwater from site activities while the additional wastewater infrastructure is constructed. A summary of the proposed permit changes is included in the permit and fact sheet documents and includes the following:

- Updates to the Schedule C – Compliance Schedule dates for wastewater storage. The port has made progress on design and construction of new lined storage lagoons and is expected to cease winter irrigation one year ahead of schedule. As such, the date for completion of lined storage has been moved ahead by one calendar year and is now required by November 1, 2025.
- Updates to the non-growing season Schedule A permit limits now require the port to develop an enhanced risk-based irrigation plan prior to the November 1, 2024 non-growing season period. Fields deemed to be higher risk of leaching based on nitrogen within the soil profile, potential higher risk to impact downgradient groundwater, and fields with high soil moisture will be excluded from receiving non-growing season irrigation. This enhanced risk-based irrigation plan replaces the prior soil nitrate limits, allowing the port to manage the same or a reduced volume of irrigation water at an increased soil surface area of lower risk sites to further minimize potential nitrate losses. This update is meant to reduce potential nitrate leaching to groundwater during the upcoming winter season while the port constructs the additional lined wastewater storage lagoons and ceases the winter program.
- Updates to the Schedule C – Compliance Schedule date for secondary treatment. The port has added the required primary treatment anaerobic digesters and has performed initial design on secondary treatment systems. The port has experienced delays in the construction schedule and financing for adding secondary treatment by the current 2025 deadline. As such, the modified permit schedule requires secondary treatment, but provides more time for financing, proper design, and completion of construction. Although the secondary treatment timeline is being extended, the port will bring the additional storage lagoons online sooner than the prior permit required so that winter irrigation is ceased after one more winter irrigation period of November 2024-February 2025 (see items above).
- Updates to the permit language due to the new storage lagoons coming online and for the new systems to be monitored.
- Includes a new requirement for the port to install additional soil moisture sensors at the land application areas to enhance monitoring and further minimize potential for nitrate leaching losses.
- As part of the permit modification, the facility proposes to bring on additional land application acreage in Morrow County. Expansion of acreage is in accordance with the MAO compliance plan and assists the facility in minimizing potential leaching while increasing crop uptake of applied nitrogen as storage and treatment infrastructure is constructed. The facility will be required to monitor and protect groundwater through site management practices at the existing and expanded acres in the program. The expansion areas are located farther from population centers and private domestic wells. The expansion area and more information about the prior use of the site is included in the permit fact sheet and technical information included with the proposed modification package.

The port and DEQ executed a Mutual Agreement and Order (MAO WQ/I-ER-2021-106) on October 31, 2023 finalizing penalties for prior violations, requiring additional corrective actions via a compliance plan, setting a wastewater volume limitation on the port, and setting stipulated penalties for future violations of the permit winter limits. The agreement directs penalty funds to an Oregon Health Authority project to provide safe drinking water in the Lower Umatilla Basin Groundwater Management Area. In April 2024, DEQ issued stipulated penalties to the port per the MAO for \$727,050. The facility is expected to have one more non-growing season of irrigation until the practice is ceased. Upon cessation of the non-growing season irrigation program by November 1, 2025, DEQ expects compliance actions regarding non-growing season irrigation will be met.

Part of the review process for the proposed modification is an opportunity for public comment on the request for modification and the proposed permit changes. Subject to public review and comment, DEQ plans to modify the permit.

About the facility

The Port of Morrow provides industrial wastewater treatment, storage and land application for businesses in the industrial park near Boardman. The port also manages the storage and discharge of supplemental water from irrigation canals, groundwater wells and the Columbia River. These supplemental and industrial wastewater sources are land applied for crop production via individual center-pivot irrigation systems currently at five farm areas. Wastewater receives primary treatment via anaerobic digesters and settling ponds prior to land application, while other sources low in nitrogen such as datacenter cooling waters can be directly land applied within the growing season. The permit does not allow any discharges to waterways.

At the time of this permit action, a total of approximately 11,718 acres of agricultural land encompasses the port's year-round land application program. The proposed land expansion would add to the acres available for irrigation under the port's permit.

The port holds DEQ air quality permit number 25-0060 for the anaerobic digester system, which expires March 1, 2025.

What types of pollutants does the permit regulate?

The permit regulates pollutants typically associated with industrial wastewater, specifically from food processing operations and cooling water. Port of Morrow wastewater contains dissolved solids, organic materials and nitrogen compounds. Although nitrogen is a beneficial plant nutrient, applying too much nitrogen to land from industrial sources and farming practices can contribute to contamination in groundwater. Nitrate above a certain concentration can be harmful to health, particularly for infants and pregnant people. The permit contains restrictions on land application operations to prevent groundwater contamination in accordance with OAR 340-040.

The permit prohibits wastewater discharge directly to waters of the state and requires the Port of Morrow to have a dedicated environmental supervisor for wastewater treatment and disposal operations.

Would the modified permit change the amount of pollution the facility is allowed to release?

Yes. The permit requires the port add both treatment and storage capacity to its system. Treatment reduces the concentration of contaminants, such as nitrogen, in the wastewater while lined storage with leak detection will enable the port to cease land applying high nitrogen wastewater in the non-growing season. The modified permit moves up the schedule for added storage by one year and mandates treatment in a defined schedule.

How does DEQ determine permit requirements?

DEQ evaluates types and amounts of pollutants and the water quality of the surface water or groundwater where the pollutants are proposed to be discharged to determine permit requirements. This ensures the proposed discharges will meet applicable statutes, rules, regulations and effluent guidelines of Oregon and the Clean Water Act.

DEQ relied solely on these documents and made no other discretionary decisions for the permit action.

How does DEQ monitor compliance with the permit requirements?

This permit and management plan require the port to monitor for pollutants discharged using approved monitoring practices and standards. DEQ reviews the port's monthly discharge monitoring reports and comprehensive annual reports to check for compliance with permit limits. DEQ also conducts on-site inspections of the port's operations and reviews engineering design plans for proposed infrastructure upgrades.

What happens next?

DEQ will consider all comments received before making a decision on the proposed permit modification. DEQ gives equal weight to written and verbal comments.

For more information

View information about this proposed permit issuance including the application, permit evaluation report, and underlying documents online or by contacting DEQ's Water Quality Permit Coordinator, Patty Isaak at water.permitter@deq.oregon.gov or 541-613-1125 to make an appointment to review the documents in person.

Non-discrimination statement

DEQ does not discriminate on the basis of race, color, national origin, disability, age or sex in administration of its programs or activities. Visit DEQ's [Civil Rights and Environmental Justice page](#).



AVISO PÚBLICO

Fecha de publicación: 9.9.2024

El DEQ solicita comentarios y organiza una audiencia pública sobre la modificación propuesta del permiso de calidad del agua para el Puerto de Morrow

CÓMO PROPORCIONAR COMENTARIOS PÚBLICOS

Nombre del establecimiento: Puerto de Morrow

Tipo de permiso: Permiso para las Instalaciones de Control de la contaminación del Agua Industrial

Detalles de la audiencia: 9 de octubre, 6 p.m.,
Riverside Junior/Senior High School Library,
210 Boardman Ave NE, Boardman, OR 97818

Virtualmente:

<https://ordeq.org/POMPermitModPublicHearing>

Teléfono gratuito: 833-548-0276

ID de la reunión: 837 5331 1613

Contraseña: 589347

Envíe los comentarios escritos a:

Por correo postal: Coordinador de permisos, Oregon
DEQ, 800 SE Emigrant Ave., Ste 330 Pendleton OR
97801

Por correo electrónico:

Water.PermitER@deq.oregon.gov

El plazo de los comentarios cierra: el viernes 11 de octubre de 2024 a las 5 p.m.

El Departamento de Calidad Medioambiental de Oregon invita al público a proporcionar comentarios por escrito o a asistir a una audiencia pública para proporcionar comentarios verbales sobre la modificación del permiso de calidad del agua propuesta por el Puerto de Morrow, conocido oficialmente como permiso de Instalaciones de Control de la Contaminación del Agua. La modificación del permiso es necesaria para hacer cambios que permitan un lenguaje que incluya los requisitos de gerencia de riego en la temporada que no se cultiva, plazos para añadir tanto el tratamiento como el almacenamiento de las aguas negras, y para una propuesta de expansión del área de aplicación de la tierra. Se incluye una copia de los documentos de la petición de la modificación del permiso y la información técnica que describe la base y las razones para las modificaciones adjunto al paquete del borrador del permiso.

Resumen

El permiso permite que el Puerto de Morrow opere unas instalaciones de tratamiento de las aguas negras industriales consistiendo de un sistema de recolección, infraestructura para el tratamiento de las aguas negras, estanques de almacenamiento y aplicación de las aguas negras a la tierra para el consumo de los cultivos. El puerto puede operar solo de acuerdo con el permiso y un plan de operaciones, monitoreo y gerencia aprobado por DEQ. Las operaciones se llevan a cabo en los condados de Morrow y Umatilla.

El DEQ modificó el permiso en noviembre de 2022 requiriendo un plazo de cumplimiento para agregar tratamiento primario de aguas residuales mediante digestores anaeróbicos, diseñar y construir un tratamiento secundario de aguas negras y diseñar y construir lagunas revestidas adicionales para detener la eliminación de aguas negras en invierno. El cese del riego invernal, la mejora del monitoreo y los reportes para una

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gerencia de riego más precisa, y el tratamiento y almacenamiento de las aguas negras, son mejoras clave requeridas para que el puerto proteja las aguas subterráneas de sus operaciones de aplicación a la tierra.

Esta modificación ha sido propuesta por el puerto, y revisada por DEQ para mejorar la protección de las aguas subterráneas de las actividades del sitio, mientras se construye infraestructura adicional para las aguas negras. Se incluye un resumen de los cambios de permiso propuestos en los documentos del permiso y la hoja de datos e incluye lo siguiente:

- Actualizaciones al programa C- fechas del programa de cumplimiento para el almacenamiento de las aguas negras. El puerto ha progresado en el diseño y la construcción de nuevas lagunas recubiertas y se espera que cese el riego invernal un año antes de lo previsto. Como tal, la fecha para completar el almacenamiento revestido se adelantó un año calendario y ahora se requiere antes del 1 de noviembre de 2025.
- Las actualizaciones de los límites de los permisos del Anexo A de la temporada sin cultivos ahora requieren que el puerto desarrolle un plan de riego mejorado basado en riesgos antes del período de la temporada sin cultivos del 1 de noviembre de 2024. Los campos que se consideren con mayor riesgo de lixiviación basada en nitrógeno dentro del perfil del suelo, un mayor riesgo potencial de afectar el agua subterránea descendente y los campos con alta humedad del suelo quedarán excluidos de recibir riego en temporadas fuera de crecimiento. Este plan de riego mejorado basado en el riesgo reemplaza los límites anteriores de nitrato en la tierra, lo que permite que el puerto administre el mismo volumen o un volumen reducido de agua de riego en una mayor superficie de la tierra en sitios de menor riesgo para minimizar aún más las posibles pérdidas de nitrato. Esta actualización tiene el propósito de reducir las posibles filtraciones de nitrato a las aguas subterráneas durante la próxima temporada de invierno mientras el puerto construye lagunas de almacenamiento para las aguas negras revestidas adicionales y finaliza el programa de invierno.
- Actualizaciones al programa C- fechas de cumplimiento para el tratamiento secundario. El puerto ha agregado los digestores anaeróbicos de tratamiento primario necesarios y ha realizado el diseño inicial de los sistemas de tratamiento secundario. El puerto ha experimentado retrasos en los plazos de construcción y financiamiento para agregar tratamiento secundario antes de la fecha límite actual de 2025. Como tal, el plazo de los permisos modificado requiere un tratamiento secundario, pero brinda más tiempo para el financiamiento, el diseño adecuado y la finalización de la construcción. Aunque se está ampliando el plazo del tratamiento secundario, el puerto pondrá en funcionamiento las lagunas de almacenamiento adicionales antes de lo que requería el permiso previo, de modo que el riego invernal cesará después de un período de riego invernal más de noviembre de 2024 a febrero de 2025 (consulte los artículos anteriores).
- Actualizaciones al lenguaje del permiso debido a la entrada en funcionamiento de nuevas lagunas de almacenamiento y a los nuevos sistemas a monitorear.
- Incluye un nuevo requisito para que el puerto instale sensores adicionales de humedad en la tierra en las áreas de aplicación a la tierra para mejorar el monitoreo y minimizar aún más el potencial de pérdidas por lixiviación de nitrato.
- Como parte de la modificación del permiso, la instalación propone incorporar áreas adicionales de solicitud de terrenos en el condado de Morrow. La expansión de la superficie está de acuerdo con el plan de cumplimiento de MAO y ayuda a la instalación a minimizar la posible lixiviación mientras aumenta la absorción de nitrógeno aplicado por los cultivos a medida que se construye la infraestructura de almacenamiento y tratamiento. Se requerirá que la instalación monitoree y proteja el agua subterránea a través de prácticas de gerencia del sitio en los acres existentes y ampliados en el programa. Las áreas de expansión se ubican más alejadas de los centros de población y de los pozos domésticos privados. El área de expansión y más información sobre el uso anterior del sitio se incluyen

en la hoja de datos del permiso y la información técnica incluida con el paquete de modificación propuesto.

El puerto y el DEQ ejecutaron un Acuerdo y Orden Mutuos (MAO WQ/I-ER-2021-106) el 31 de octubre de 2023, finalizando las sanciones por infracciones anteriores, requiriendo acciones correctivas adicionales a través de un plan de cumplimiento, estableciendo una limitación del volumen de las aguas negras en el puerto. y estableciendo sanciones estipuladas para futuras infracciones de los límites invernales del permiso. El acuerdo dirige los fondos de las sanciones a un proyecto de la Autoridad de Salud de Oregón para proporcionar agua potable segura en el Área de Gestión de Agua Subterránea de la Cuenca Inferior de Umatilla. En abril de 2024, el DEQ expidió las sanciones estipuladas para el puerto según la MAO por \$727,050 dólares. Se espera que la instalación tenga una temporada más de riego sin cultivos hasta que cese la práctica. Tras el cese del programa de riego en temporadas sin cultivo antes del 1 de noviembre de 2025, el DEQ espera que se cumplan las acciones de cumplimiento con respecto al riego en temporadas sin cultivo.

Parte del proceso de revisión de la modificación propuesta es una oportunidad para comentarios públicos sobre la solicitud de modificación y los cambios de permiso propuestos. Sujeto a revisión y comentarios públicos, el DEQ planea modificar el permiso.

Sobre las instalaciones

El Puerto de Morrow ofrece tratamiento, almacenamiento y aplicación a la tierra de las aguas negras industriales para las empresas en el parque industrial cerca de Boardman. El puerto también gestiona el almacenamiento y la descarga del agua suplementaria de los canales de riego, pozos de agua subterránea y del río Columbia. Estas fuentes de aguas negras industriales y suplementarias son tierras en uso para la producción de cultivos a través de sistemas de riego de pivote central individuales, que actualmente se encuentran en cinco áreas agrícolas. Las aguas negras reciben un tratamiento primario a través de digestores anaeróbicos y estanques de sedimentación antes de su aplicación a la tierra, mientras que otras fuentes bajas en nitrógeno, como las aguas de refrigeración de los centros de datos, pueden aplicarse directamente a la tierra durante la temporada de cultivo. El permiso no permite ningún vertido a vías fluviales.

En el momento de esta acción del permiso, un total de aproximadamente 11,718 acres de tierras agrícolas componen el programa de solicitud de tierras del puerto durante todo el año. La ampliación del terreno propuesta se sumaría a los acres disponibles para el riego según el permiso del puerto.

El puerto posee el permiso de calidad del aire DEQ número 25-0060 para el sistema de digestión anaeróbica, que vence el 1 de marzo de 2025.

¿Qué tipos de contaminantes regula el permiso?

El permiso regula los contaminantes típicamente asociados con las aguas negras industriales, específicamente de las operaciones de procesamiento de alimentos y el agua de refrigeración. Las aguas negras del Puerto de Morrow contienen sólidos disueltos, materiales orgánicos y compuestos de nitrógeno. Aunque el nitrógeno es un nutriente beneficioso para las plantas, la aplicación excesiva de nitrógeno a la tierra procedente de fuentes industriales y prácticas agrícolas puede contribuir a la contaminación de las aguas subterráneas. El nitrato por encima de cierta concentración puede ser perjudicial para la salud, especialmente para los bebés y las mujeres embarazadas. El permiso contiene restricciones sobre las operaciones de aplicación a la tierra para prevenir la contaminación del agua subterránea de acuerdo con OAR 340-040.

El permiso prohíbe el vertido de aguas negras directamente a las aguas del estado y requiere que el Puerto de Morrow tenga un supervisor medioambiental dedicado a las operaciones de tratamiento y a la eliminación de aguas negras.

¿El permiso modificado cambiaría la cantidad de contaminación que la instalación puede liberar?

Sí. El permiso requiere que el puerto agregue capacidad de tratamiento y almacenamiento a su sistema. El tratamiento reduce la concentración de contaminantes, como el nitrógeno, en las aguas negras, mientras que el almacenamiento revestido con detección de fugas permitirá que el puerto deje de aplicar aguas negras con alto contenido de nitrógeno en la temporada sin cultivos. El permiso modificado adelanta un año el plazo de almacenamiento adicional y exige el tratamiento en un plazo definido.

¿Cómo determina el DEQ los requisitos de permiso?

El DEQ evalúa los tipos y las cantidades de contaminantes y la calidad del agua superficial o subterránea donde se propone verter los contaminantes para determinar los requisitos de permiso. Esto garantiza que los vertidos propuestos cumplirán con los estatutos, reglas, regulaciones y pautas de efluentes aplicables de Oregon y la Ley de Agua Limpia.

El DEQ se basó únicamente en estos documentos y no tomó otras decisiones discrecionales para la acción del permiso.

¿Cómo monitorea el DEQ el cumplimiento de los requisitos del permiso?

Este permiso y plan de gestión requieren que el puerto controle la descarga de contaminantes utilizando prácticas y estándares de control aprobados. El DEQ revisa los informes mensuales de monitoreo de los vertidos del puerto y los informes anuales completos para verificar el cumplimiento de los límites del permiso. El DEQ también realiza inspecciones in situ de las operaciones del puerto y revisa los planes de diseño de ingeniería para las mejoras de infraestructura propuestas.

¿Qué pasa después?

El DEQ considerará todos los comentarios recibidos antes de tomar una decisión sobre la modificación del permiso propuesta. El DEQ da igual valor a los comentarios escritos que a los verbales.

Para más información

Vea información sobre esta propuesta de emisión de permiso, incluida la solicitud, el informe de evaluación del permiso y los documentos subyacentes en línea o comunicándose con el Coordinador de Permisos de Calidad del Agua del DEQ, en water.permiter@deq.oregon.gov o al 541-613-1125 para programar una cita para revisar los documentos personalmente.

Declaración de no discriminación

DEQ no discrimina por motivos de raza, color, origen nacional, discapacidad, edad o sexo en la administración de sus programas o actividades. Visite [la página de Derechos Civiles y Justicia Ambiental del DEQ](#).



WATER POLLUTION CONTROL FACILITIES PERMIT

Modification #4

Department of Environmental Quality
Eastern Region
800 S.E. Emigrant Avenue, Suite #330, Pendleton, OR 97801
Telephone: (541) 276-4063
Issued pursuant to ORS 468B.050

ISSUED TO:

Port of Morrow
Post Office Box 200
Boardman, OR 97818

SOURCES COVERED BY THIS PERMIT:

<u>Type of Waste</u>	<u>Method of Disposal</u>
Industrial Wastewater	Land Application

FACILITY TYPE AND LOCATION:

Wastewater Lagoons and
Land Application Treatment System

Boardman, Oregon

RIVER BASIN INFORMATION:

Basin: Umatilla
Sub-Basin: Middle Columbia / Boardman
LLID: 1240483462464-266.02
Columbia River
Location of Farm 3 Lagoon
Lat.: 45.858804
Long.: -119.618202
County: Morrow

Nearest surface stream which would receive waste if it were to
discharge: Columbia River

Renewal issued in response to Application No. 977616 received 7-20-2006. This modification is issued in response to the permit modification requests submitted to DEQ on 8-12-2024 and 9-5-2024.

This permit modification is issued based on the land use findings in the permit record.

DRAFT

Mike Hiatt, Water Quality Permit Manager
Eastern Region

DRAFT

Signature Date

DRAFT

Effective Date

PERMITTED ACTIVITIES

Until this permit expires or is modified or revoked, the Permittee is authorized to construct, install, modify, or operate a wastewater collection, treatment, control and disposal system in conformance with all the requirements, limitations, and conditions set forth in the attached schedules.

Unless specifically authorized by this permit, by another NPDES or WPCF permit, or by Oregon Administrative Rule, any other direct or indirect discharge to waters of the state is prohibited, including discharge to an underground injection control system.

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SCHEDULE A - Waste Disposal Terms and Conditions

Schedule A, Conditions 5, 8, 11, 13, and 14 are modified as follows. All other Schedule A conditions of the November 2, 2022 permit are not modified.

Authorized Land Application Sites

- (5) The Permittee is authorized to land apply permitted wastes only at the land application sites authorized by a DEQ-approved OM&M Plan. The Permittee must request and receive written authorization from the Department prior to application of wastewater at any site not listed in the DEQ-approved OM&M Plan. ~~The Permittee is authorized to apply wastewater at the following application sites or as listed in a DEQ-approved OM&M Plan:~~
- ~~(A) Farm 1 (Portview) authorized application sites listed in OM&M Plan.~~
 - ~~(B) Farm 2 (Southport) authorized application sites listed in OM&M Plan.~~
 - ~~(C) Farm 3 (Eastport) authorized application sites listed in OM&M Plan.~~
 - ~~(D) Madison Expansion authorized application sites listed in OM&M Plan.~~
 - ~~(E) Mader Rust authorized application sites listed in OM&M Plan.~~

Nitrogen Availability and Loading

- (8) Unless otherwise authorized by the Department in writing, the Permittee is prohibited from allowing the nitrogen available to crops at approved application sites to exceed the crop-specific agronomic rates listed in the approved OM&M Plan. For this permit, ~~unless other calculation methods are approved by the Department in writing~~, the nitrogen available to an individual crop between field preparation at crop start and harvest is the sum total of all nitrogen from the following sources:
- (A) All nitrate (NO_3) in the crop-specific root zone of soil,
 - (B) All ammonium (NH_4) in the first foot of the root zone of soil,
 - (C) 70% of the Total Kjeldahl Nitrogen (TKN) in applied wastewater¹,
 - (D) All Nitrate/Nitrite-N in applied wastewater and supplemental irrigation water from any source,
 - (E) All nitrogen applied as commercial fertilizer,
 - (F) Plant Available Nitrogen from applied manure and cover crops tilled under (calculated per approved OM&M Plan), and
 - (G) All nitrogen from any other source applied between crop start and harvest.

¹Upon completion of the anaerobic digester project (beginning November 1, 2023), the Total Nitrogen in applied wastewater is to be used to calculate ~~wastewater nitrogen~~ loading (all TKN plus Nitrate/Nitrite-N).

Leaching Prohibition

- (11) Other than a prescribed leaching event pre-approved by the Department the leaching of moisture and nutrients caused by means of irrigation beyond the 5th foot of the soil column is prohibited.

A violation of this prohibition will have occurred at an approved application site anytime required ~~soil~~ moisture monitoring ~~as described in the OM&M~~ determines that the ~~average soil~~ moisture is at or above the ~~field~~ capacity for the field ~~past~~ in the 5th foot of the soil column caused by irrigation, unless the permittee demonstrates that the excess moisture was due to reasons beyond its reasonable control such as excessive precipitation.

Active irrigation activities ~~during the growing season~~ may saturate up to field capacity only the listed rooting depth of the current crop. ~~Irrigation activities during the non-growing season must adhere to the limits specified in Schedule A(13) of this permit.~~

Non-Growing Season Limits

- (13) The Permittee must conduct all land application activities during the non-growing season in accordance with the permit and the facility OM&M Plan. The non-growing season is defined by this permit as November 1st through February.
- (A) The OM&M plan must include, but is not limited to, the following terms and conditions for operations during the non-growing season:
- (i) Application sites must be ranked and evaluated according to the presence and location of nitrogen and moisture in the soil profile, ~~and~~ water holding capacity (field capacity), modeled nitrate leaching potential using publicly available models, and other factors, ~~the moisture level in the 4th foot of the soil profile,~~
 - (a) Based on the evaluation, the permittee shall submit a Non-Growing Season Irrigation Plan for DEQ approval prior to the beginning of each non-growing season that describes how the Port plans to irrigate sites based on the criteria in Schedule 13(A)(i).
 - (b) The permittee shall irrigate sites during the non-growing season in accordance with the DEQ approved Non-Growing Season Irrigation Plan.
 - (c) Application sites are prohibited from receiving non-growing season irrigation if they are ranked as “high risk” in accordance with the approved Non-Growing Season Irrigation plan evaluation.
 - (ii) Application sites where the sum of soil nitrate (as N), ~~in the 4th and 5th foot,~~ in the top five feet of soil is greater than or equal to 150 lbs/ac are prohibited from receiving non-growing season irrigation,
 - (iii) Application sites are also prohibited from receiving non-growing season irrigation if they are ranked as “high risk” in accordance with a Non-Growing Season groundwater risk-ranking plan approved by DEQ, taking into consideration the distance to downgradient domestic drinking water wells, depth to groundwater, and other factors.
 - (iv) Application sites with soil moisture in the 4th foot of the soil profile equal to or greater than 75% of the 4th foot water-holding capacity are prohibited from receiving additional non-growing season irrigation,
 - (v) Non-growing season irrigation is to be limited to utilization of the available water-holding capacity in the top three (3) feet of the soil column, only, and
 - (vi) Non-growing season irrigation events ~~will~~must be planned based on the most recent soil moisture monitoring event.
 - (vii) These interim limits apply until November 1, ~~2026~~2025 when non-growing season wastewater ~~will~~must be stored except as approved by DEQ for beneficial use with treated effluent in accordance with Schedule A(14).
- (B) Supplemental commercial nitrogen fertilizer application is not permitted from November 15 – February 15 without DEQ approval.

Effluent Treatment and Storage

- (14) By no later than November 1, ~~2025~~2029 the facility must not exceed the following effluent concentration limits for all wastewater land applied during the non-growing season:

Table A1: Final Effluent Concentration Limits

Parameter	Monthly Average
Total Nitrogen ¹	7 mg/L
Total Suspended Solids (TSS)	20 mg/L
BOD ₅	20 mg/L
pH	Instantaneous limit of 6.0 – 9.0

¹ Total Kjeldahl Nitrogen (TKN) plus Nitrate/Nitrite-N

- (A) The permittee must utilize the wastewater treatment system during the growing season (March 1 – October 31) as necessary to **reduce effluent constituent concentrations and** ensure permit compliance.
- (B) Beginning November 1, ~~2026~~2025, all wastewater is to be stored in lined lagoons for the non-growing season unless authorized for beneficial uses using wastewater treated to the ~~se~~Table A1 standards and as described in a DEQ-approved OM&M.

Public Notice Draft

SCHEDULE B – Minimum Monitoring and Reporting Requirements

Schedule B, Conditions 3, 4(B), 4(C), 4(D), 6, and 14 are modified as follows. All other Schedule B conditions of the November 2, 2022 permit are not modified.

Visual Inspections

(3) The Permittee shall perform the following visual inspections:

Table B2: Visual Inspections

Item or Parameter	Minimum Frequency	Sample Type/Action
Inspect Storage Lagoon dikes	Weekly	Record Observations ¹
Inspect pipelines	Daily when in use	Record Observations ¹
Inspect land application sites	Daily when irrigating	Record Observations ¹
Inspect sprinkler nozzles	Semi-annually	Record Observations ¹
Pond 41-s Storage lagoon volume, MG	Daily, Each Lagoon	Record Observations ¹ Record Amount Stored in MG Record Total Storage Capacity in MG
Sand Dune storage lagoon volume, MG	Daily	Record Observations ¹
Inspect wastewater treatment units	Daily when in use	Record Observations ²

¹ Maintain record of inspector, date, time, and operational status.

² Maintain record of inspector, date, time and operational status of each wastewater treatment unit including the digesters and secondary treatment system. Inspect in accordance with Operations and Maintenance Manual for each unit when in operation.

With the exception of the storage pond lagoon volumes which must be reported monthly, Table 2 information must be retained by the permittee according to Schedule F- General Conditions- Condition C(4) and must be provided to the Department upon request.

Flow Monitoring

(4) The Permittee shall monitor wastewater treatment system flows as follows:

(B) Wastewater system internal measured flow, gallons per day (gpd):

Table B4: Internal Flow Monitoring

Item or Parameter	Minimum Frequency	Sample Type/Action
South Pump Station Discharge	Daily	Record Daily Data, Totalize Monthly
North Pump Station Discharge	Daily	Record Daily Data, Totalize Monthly
Discharge to 41 Storage Lagoons	Daily	Record Daily Data, Totalize Monthly For Each Lagoon
Discharge to Sand Dune Storage Lagoon	Daily	Record Daily Data, Totalize Monthly
41 Lagoon Meter #1	Daily	Record Daily Data, Totalize Monthly
41 Lagoon Meter #2	Daily	Record Daily Data, Totalize Monthly
41 Lagoon Meter #3	Daily	Record Daily Data, Totalize Monthly
41 Lagoon Meter #4	Daily	Record Daily Data, Totalize Monthly
41 Lagoon Meter #5	Daily	Record Daily Data, Totalize Monthly
Influent to Each Wastewater Treatment System Unit ¹	Daily	Record Daily Data, Totalize Monthly

Effluent from Each Wastewater Treatment System Unit ¹	Daily	Record Daily Data, Totalize Monthly
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¹ Each digester and secondary treatment oxidation ditch is a treatment unit.

(C) Wastewater applied as irrigation to each farm area, gallons per day (gpd):

Table B5: Wastewater Irrigation

Item or Parameter	Minimum Frequency	Sample Type/Action
Farm 1	Daily	Record Daily Data, Totalize Monthly
Farm 2	Daily	Record Daily Data, Totalize Monthly
Farm 3	Daily	Record Daily Data, Totalize Monthly
Madison Farms Farm 4	Daily	Record Daily Data, Totalize Monthly
Mader Rust Farms Farm 5	Daily	Record Daily Data, Totalize Monthly
Farm 6	Daily	Record Daily Data, Totalize Monthly
Additional Farm Areas as approved by DEQ	Daily	Record Daily Data, Totalize Monthly

(D) Supplemental water applied as irrigation to each farm area, gallons per day (gpd):

Table B6: Supplemental Water Irrigation

Item or Parameter	Minimum Frequency	Sample Type/Action
Farm 1	Daily	Record Daily Data, Totalize Monthly
Farm 2	Daily	Record Daily Data, Totalize Monthly
Farm 3	Daily	Record Daily Data, Totalize Monthly
Madison Farms Farm 4	Daily	Record Daily Data, Totalize Monthly
Mader Rust Farms Farm 5	Daily	Record Daily Data, Totalize Monthly
Farm 6	Daily	Record Daily Data, Totalize Monthly
Additional Farm Areas as approved by DEQ	Daily	Record Daily Data, Totalize Monthly

Commercial Fertilizer and Additional Nitrogen Sources

(6) The Permittee must monitor nitrogen applied as commercial fertilizer (Commercial Fertilizer - N, lbs/ac) and any other nitrogen sources applied, to each crop, at each approved application site in the following manner:

Table B9: Additional Nitrogen Sources

Item or Parameter, Units	Minimum Frequency	Sample Type/Action
Commercial Fertilizer Nitrogen, lbs/ac, Other Nitrogen sources including manure (lbs/ac)	As applied	Record amounts, Totalize monthly for each application site, and totalize collectively for each Farm Farm 1, Farm 2, Farm 3, Madison Farms, and Mader Rust Farms.

Reporting Requirements

Facility Monthly Report

(14) The Permittee must submit a monthly facility monitoring report (FMR). The reporting period for the FMR is the calendar month. The FMR for each calendar month must be submitted, to the Department, on or before the 15th of the next calendar month. The FMR format and content must be in accordance with DEQ approval, and must include, but not be limited to:

- (A) Monitoring results as required by Schedule B- Condition (3)- Table B2¹
- (B) Monitoring results as required by Schedule B- Condition (4)(A)- Table B3,
- (C) Monitoring results as required by Schedule B- Condition (4)(B)- Table B4,
- (D) Monitoring results as required by Schedule B- Condition (4)(C)- Table B5,
- (E) Monitoring results as required by Schedule B- Condition (4)(D)- Table B6,
- (F) Monitoring results as required by Schedule B- Condition (4)(E)-Table B7,
- (G) Monitoring results as required by Schedule B- Condition (5)-Table B8,
- (H) Monitoring results as required by Schedule B- Condition (6) -Table B9,
- (I) A narrative summary to include, but not be limited to a written evaluation of:
 - (i) General wastewater system performance, issues and concerns,
 - (ii) Wastewater system maintenance, repair and construction,
 - (iii) Changes at authorized wastewater sources with the potential to impact system operation or capacity, and
 - (iv) A statement that either confirms compliance with all the terms and conditions of the permit and OM&M Plan or lists violations that have occurred during the reporting month².

¹Report ~~only~~ the stored wastewater volume and total storage capacity in ~~each lagoon 41 Lagoon and Sand Dune Lagoon~~ on last day of reporting month.

²In response to a violation notification, DEQ may investigate to evaluate the nature and extent of the violation and may require additional information and/or corrective actions from the Permittee. Compliance with this requirement does not relieve the Permittee from responsibility to maintain continuous compliance with the conditions of this permit or the resulting liability for failure to comply.

SCHEDULE C – COMPLIANCE SCHEDULE

Schedule C conditions are updated as shown below. Schedule C, Conditions 1, 2, 3, and 6 of the November 2, 2022 permit are not modified.

4. Secondary Treatment of Wastewater Effluent

Complete By	Requirement
December 31, 2022 September 1, 2025	Submit a Preliminary Design Report to DEQ for review of Secondary Treatment System. The preliminary design report must include nitrogen and hydraulic balances to document system capacity upon completion of the project.
July 30, 2023 April 1, 2026	Submit 90% Plans and Specifications to DEQ for review of Secondary Treatment System. The 90% plans must address all DEQ comments on the Preliminary Design Report.
December 31, 2023 December 31, 2026	The permittee must submit to DEQ: 1. Final draft plans and specifications in accordance with OAR 340-052 for a selected secondary treatment system. 2. A completed Land Use Compatibility Statement (LUCS) for the selected project.
April 1, 2027	Submit to DEQ a progress status report.
April 1, 2028	Submit to DEQ a progress status report.
April 1, 2029	Submit to DEQ a progress status report.
July 1, 2029	Complete construction and startup of the secondary treatment system as per the DEQ-approved plans and specifications.
October 1, 2029	Submit to DEQ a summary of performance for the Secondary Treatment System. The summary must include a comparison of the wastewater characteristics in Table B8 before and after secondary treatment.
November 1, 2029	The permittee must comply with Schedule A(14) effluent limits for wastewater land applied in the non-growing season and use the secondary treatment system in the growing season to ensure permit compliance and groundwater protection.

5. Storage of Non-Growing Season Effluent

Complete By	Requirement
May 31, 2023	Submit Preliminary Design Report to DEQ for review of Storage Addition to cease non-growing season disposal program. The preliminary design must include nitrogen and hydraulic balances to document system capacity upon completion of the project.
November 30, 2023	Submit 90% Plans and Specifications to DEQ for review of Storage Addition. The 90% plans must address all DEQ comments on the Preliminary Design Report.
April 1, 2024	The permittee must submit to DEQ: 1. Final draft plans and specifications in accordance with OAR 340-052 for the storage system. 2. A completed Land Use Compatibility Statement (LUCS) for the selected project.
April 1, 2025	Submit to DEQ a progress status report.
November 1, 2026 November 1, 2025	The permittee must complete construction and provide DEQ a start-up summary for the project in accordance with DEQ approval. Any wastewater applied during the non-growing season after this date, must be treated to Schedule A(14) effluent limits and for defined beneficial use as described in the facility OM&M plan and approved by DEQ.

7. Groundwater Corrective Measures and Remedial Actions

Complete By	Requirement
March 31, 2025	Submit an update to the August 29, 2023 Farms 1-5 Remedial Investigation/Feasibility Study and Corrective Measures Plan. The updated plan must include: 1. A summary of current groundwater monitoring trend analysis at Farms 1, 2, 3, 4, and 5. 2. A summary of groundwater trend analysis and proposed groundwater concentration limits at the acreage expansion for Farm 6. 3. All RI/FS information required under OAR 340-040-0040. 4. An update on corrective actions completed and identification of new proposed corrective actions as necessary, to include the new Farm 6 acreage.

8. Responsibility to Meet Compliance Dates

No later than 14 days following each compliance date listed in the tables above, the permittee must notify DEQ in writing of its compliance or noncompliance with the requirements. Any reports of noncompliance must include the cause of noncompliance, any remedial actions taken, and a discussion of the likelihood of meeting the next scheduled requirement.

SCHEDULE D - Special Conditions

Schedule D, Condition 13 is modified and new condition 17 is added to the permit as follows. All other Schedule D conditions of the November 2, 2022 permit are not modified.

Total Kjeldahl Nitrogen Availability

- (13) Unless otherwise approved by DEQ in writing, the Permittee must assume that 70% of Total Kjeldahl Nitrogen (TKN) applied to an authorized application site becomes plant available during the crop season when calculating nitrogen loading rates until the date specified in Schedule A(8).

Soil Moisture Monitoring Sensor Density and Calibration

- (17) By November 1, 2024, the facility must install additional soil moisture monitoring sensors at all fields that will receive non-growing season irrigation at a minimum density of one sensor per twenty-five acres. The facility must provide written verification to DEQ of completion of the additional soil moisture sensors prior to the November 1, 2024 non-growing season period. Sensors must be installed and calibrated in accordance with the OM&M Plan and used to assess permit non-growing season and leaching compliance as per the approved OM&M.

By no later than the April 15th, 2025 OM&M plan update, the facility must provide a plan and schedule to also begin assessing site soil field capacity using additional verified methodology of 1) the Saxton and Rawls Method, or 2) the pressure plate method. The facility may propose other methods along with information to support the requested approach.



State of Oregon
Department of
Environmental
Quality

Water Pollution Control Facilities Permit Fact Sheet – **Modification #4**

Oregon Department of Environmental Quality
Eastern Region - Pendleton Office
800 SE Emigrant, Suite 330
Pendleton, OR 97801

Permittee:	Port of Morrow P.O. Box 200 Boardman, OR 97818
Existing Permit Information:	File Number: 70590 Permit Number: WPCF 102325 Expiration Date: November 30, 2027 EPA Reference Number: N/A
Source Contact:	Miff Devin, Environmental Supervisor (541) 481-7467
Facility Location:	Wastewater Lagoons and Land Application Treatment System Boardman, OR 97818 Morrow County
LLID:	1240483462464
Nearest surface stream: Basin: Sub-Basin	Columbia River Umatilla Middle Columbia / Boardman
Proposed Action:	WPCF Major Permit Modification – Modification #4
Source Category:	WPCF Industrial – Tier II
Sources Covered:	Industrial Wastewater
Permit Type:	WPCF-IW-B05
Permit Writer:	Justin Sterger (541) 633-2016 Eastern Region/Water Quality Program - Bend Office September 9, 2024

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Appendix II – April 2024 Penalty Demand Notice

Appendix III – Permit Modification Requests and Technical Memorandum on Non-Growing Season Irrigation

WPCF Permit Fact Sheet - **Modification #4**

Port of Morrow

1. Introduction

This fact sheet describes the basis and methodology used in developing the permit modification in accordance with OAR 340-045-0055. Changes have been made to specific schedules of the permit as redlined in the permit document that accompanies this fact sheet. Conditions of the permit language not modified through this action remain in effect as written in the November 2, 2022 issued WPCF Permit Modification #1.

DEQ has invited input from the permittee, public, regulatory entities, and all interested parties on this proposed permit modification package which is considered a major permit modification. This permit is proposed to be modified based upon written requests from the permittee and based upon DEQ review of compliance actions taken to date and a review of permit language. Upon DEQ review, additional sections of the permit have been modified for clarity and environmental protection in addition to those requested by the facility.

2. Summary

The Port of Morrow (POM) provides wastewater management services to industrial businesses located in the POM industrial area located in Boardman, Oregon. A significant portion of the tenant facilities process potatoes and onions for the commercial market which generate nutrient-rich wastewater (which includes nitrogen, solids, salts). Tenants also include multiple data centers with cooling tower blowdown, a cheese production plant and a natural gas fired electrical generation facility. The POM collects, stores, monitors, treats, and land applies the industrial wastewater generated by these facilities under the terms and conditions of Water Pollution Control Facilities (WPCF) Permit #102325 and an Operations, Monitoring, and Management Plan (OM&M Plan). The wastewater permit covers treatment, storage, and land application of wastewater under the Port of Morrow as permittee to several farms and the system relies on uptake of applied nutrient and hydraulic loading to agricultural areas in order to protect groundwater from their activities.

The Port of Morrow does not manage domestic wastewater under the terms of the assigned WPCF permit. Instead, domestic wastewater from POM facilities and industrial businesses is routed to publicly-owned domestic wastewater treatment works which is managed under separate permitting (by the City of Boardman).

The current Port of Morrow WPCF permit became effective December 21, 2017 and expires on November 30, 2027. The permit has been modified during the current permit term on November 2, 2022, February 1, 2024, and June 3, 2024.

2.1 Compliance History

DEQ previously executed a Mutual Agreement and Order (MAO WQ/I-ER-2021-106) in October 2023 to resolve instances of non-compliance with permit limits for the period of 2018-2023. A copy of the MAO is included with this fact sheet as Appendix I. The MAO includes flow limitations on how much wastewater the facility can manage until compliance is attained, and requires management restrictions in the non-growing season in addition to the management requirements outlined in the permit.

On April 4, 2024, DEQ issued the Port a penalty demand notice for stipulated penalties associated with wastewater discharges and non-compliance with the permit non-growing season limits that occurred in the November 2023- February 2024 non-growing season and several reported wastewater spills. A copy of the penalty demand notice is included as Appendix II.

The POM has had difficulty meeting permit limits without added land application acreage, treatment to reduce nitrogen loading, and storage capacity resulting in instances of non-growing season (November – February) irrigation noncompliance. These needs triggered additional acreage and wastewater storage with the goal to prevent adverse impacts to groundwater. The facility has since taken steps under the November 2, 2022 permit modification to design additional lined winter storage, design secondary wastewater treatment systems, improve and replace aged piping and conveyance systems, and to expand the acreage available for crop uptake of applied nitrogen. The facility also brought online primary treatment via anaerobic digestion to prepare the wastewater for additional secondary treatment and to reduce solids and organic loading of applied wastewater.

The proposed modification includes additional provisions for soil moisture sensors and refined methods for assessing wastewater loading in the non-growing season that are protective of groundwater. With the phase out of non-growing season irrigation program on expedited schedule, and the additions of storage, treatment, and conveyance improvements, it is expected that the permittee will come into compliance with permit conditions required in order to better protect groundwater.

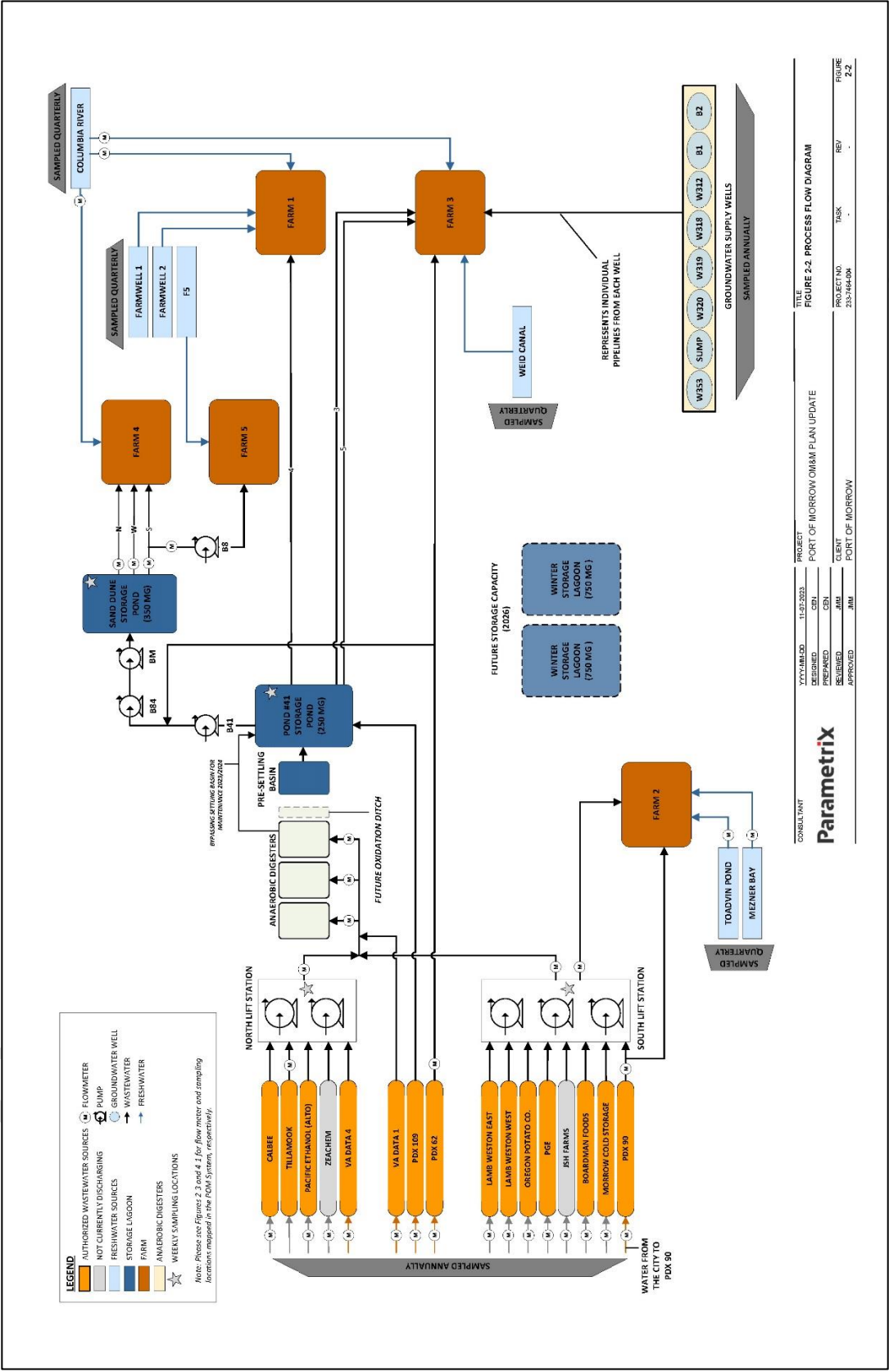
As part of the modification, the facility proposes to expand operations to a new farmed area, termed “Farm 6”. Farm 6 is the former Canyon Farms’ Easterday/Lost Valley property located at 73956 Homestead Lane, in Boardman. The property is a former confined animal feeding operation (CAFO) and dairy which was decommissioned and its National Pollutant Discharge Elimination System permit has been cancelled. Zoning of the properties is Exclusive Farm use (EFU) and the sites are currently under pivot irrigation and farming practices. The CAFO permit had required groundwater monitoring because of the facility’s potential impacts on groundwater. The property’s current [required actions](#), which include continued requirements for groundwater monitoring for monitoring wells 1, 3 and 8 and an irrigation and nutrient management and specific crop uses around those wells, are designed to reduce groundwater nitrate levels and allow prior impacts during the operation of the CAFO to naturally remediate. While Canyon Farms is required to accomplish cleanup actions, these actions will transfer to the Port of Morrow upon property acquisition and must still be completed. The port will be required to monitor

groundwater and manage site practices in accordance with the limitations of the DEQ WPCF permit. There are currently 5,348 irrigated acres at the Farm 6 property.

2.2 Facility Description

The combined industrial wastewater influent flow from all POM tenants is approximately 3.6 billion gallons (BG) a year. At the time of this permit writing, the facility is the largest industrial wastewater land application system in Oregon. The POM manages the storage and discharge of wastewater (between 7-10 million gallons per day), along with supplemental water from irrigation canals, groundwater wells, and the Columbia River. These supplemental and wastewater sources are land applied via individual center-pivot irrigations systems. At the time of this permit action, a total of 11,718 acres of agricultural lands encompass the land application program, prior to the proposed addition of Farm 6.

A process schematic of the system is provided in Figure 1 (Source: POM 2024 OM&M Plan)



CONSULTANT	PROJECT	TITLE
Parametrix	PORT OF MORROW OM&M PLAN UPDATE	FIGURE 2.2. PROCESS FLOW DIAGRAM
DESIGNED	11-27-2023	
PREPARED	11-27-2023	
REVIEWED	11-27-2023	
APPROVED	11-27-2023	
CLIENT	PORT OF MORROW	FIGURE 2.2

The numbered irrigation circles for each farm and total acreage is provided in Figure 2.

Figure 2 – Farm Circles and Acreage (Source: POM 2024 OM&M Plan)

Farm 1			Farm 2			Farm 3			Farm 4			Farm 5		
Pivot No.	Acreage		Pivot No.	Acreage		Pivot No.	Acreage		Pivot No.	Acreage		Pivot No.	Acreage	
138	55.0		201	125.0		312	125.2	329	1	122.0	117	10	158.7	
139	25.0		202	66.4		m312	17.8	328a	2	122.0	118	11	167.6	
140	36.0		203	126.0		314	64.2	328b	3	122.0	119	12	162.8	
144	24.0		204	126.0		315	121.1	329c	49	128.3	120	16	148.2	
145	65.0		205	21.4		316	106.6	330	50	153.7	121	17	170.8	
146	17.0		206	120.0		m316	41.6	331	98	125.0	122	18	152.1	
147	55.0		207	125.0		317	61.8	332	99	125.0	123	21	142.5	
148	26.0		208	126.0		318	129.5	333	100	125.0	124	22	164.4	
149	24.1		209	129.0		m318	20.0	333A	101	125.0	125	23	176.5	
150	34.0		210	21.0		319	123.6	333b	102	125.0	126	26	156.0	
154	50.0		211	16.2		m319	14.1	333C	103	113.0	127	27	150.0	
155	47.0		212	18.6		320	75.7	334	104	75.0	128	28	127.3	
156	35.0		213	126.0		m320	12.8	334	105	125.0	129	29	127.3	
157	12.0		214	80.5		321	56.0	m334	106	125.0	133	30	127.3	
			215	69.4		322	125.8	335	108	125.0	134	31	64.5	
			216	116.0		m322	20.3	336	109	85.0	135	32	58.1	
						323	128.5	337	110	125.0	136	33	46.2	
						324	149.0	338	111	125.0	137			
						m324	24.0	340	114	115.0	140			
						325	130.8	m340	115	125.0	141			
						326	125.1	341	116	74.0	142			
						326A	30.3	353						
						326B	22.2	m353						
						327	146.3	354						
						m327	24.1	355						
						328	149.8							

Farm 1	639.1
Farm 2	1,437.3
Farm 3	3,527.9
Farm 4	3,996.0
Farm 5	2,319.2
Total	11,718.5

2.3 Groundwater and The LUBGWMA

Per OAR 340-040-0020: DEQ shall employ an anti-degradation policy to emphasize the prevention of groundwater quality pollution, and to control waste discharges to groundwater so that the highest possible water quality is maintained.

The Port of Morrow and land application network are located within the Lower Umatilla Basin Groundwater Management Area (LUBGWMA). The LUBGWMA was established, as required by Oregon statute, to allow for the identification and implementation of practices that will reduce nitrate loading and reduce groundwater nitrate concentrations below 7 mg/L. The stated goal of the LUBGWMA action plan is to reduce groundwater nitrate concentrations to less than 7 mg/L throughout the region.

The fundamental practice of beneficial use for wastewater and waste solid land application operations is using soil and vegetation, along with management practices, as treatment in such a way so as to protect from groundwater contamination while also not impacting the productivity of the site for future use. If a facility is impacting groundwater, impacting site productivity for future use, and/or if their operations reside within a groundwater management area, then the generator of such waste material needs to implement greater protections (i.e. treatment, reduced nutrient application, storage).

The proposed permit modification includes additional requirements for a more densified network of soil moisture monitors at land application sites, providing additional protections for groundwater during the non-growing season in conjunction with the risk ranking systems required by Schedule A. The proposed modification also moves up the date of required winter storage by one full year, requiring phase-out of winter irrigation a year ahead of the prior permit schedule. While the addition of secondary treatment is proposed to be pushed back, the expedited schedule of winter storage will prevent further non-growing season irrigation until treatment is brought online. The proposed land area expansion to Farm 6 will supply more area for crop uptake of applied nitrogen within the stringent confines of the permit and MAO.

Figures 3, 4, and 5 shows the overhead map of the LUBGWMA, the overhead of current land application areas for the Port, and an overhead map of the proposed Farm 6 expansion area:

Figure 3 – Lower Umatilla Basin GWMA Map (Source LUBGWMA Action Plan)

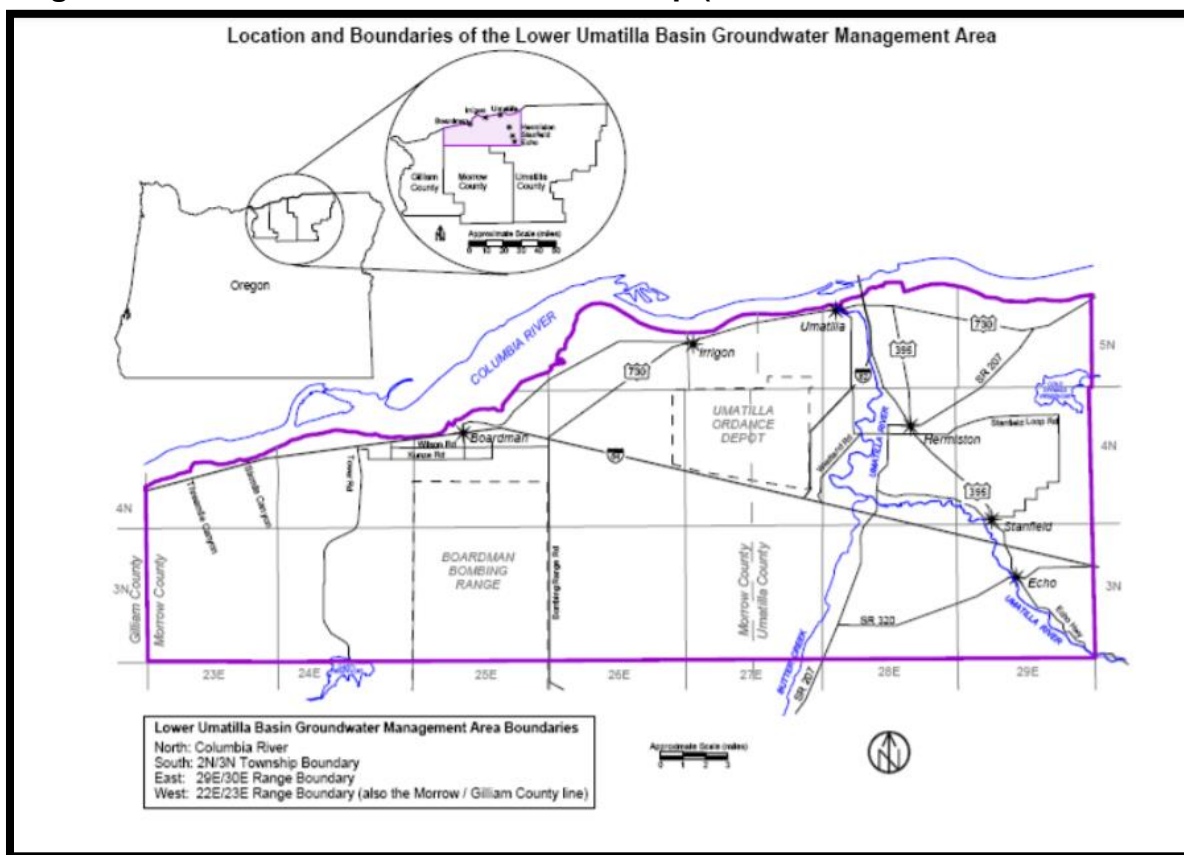
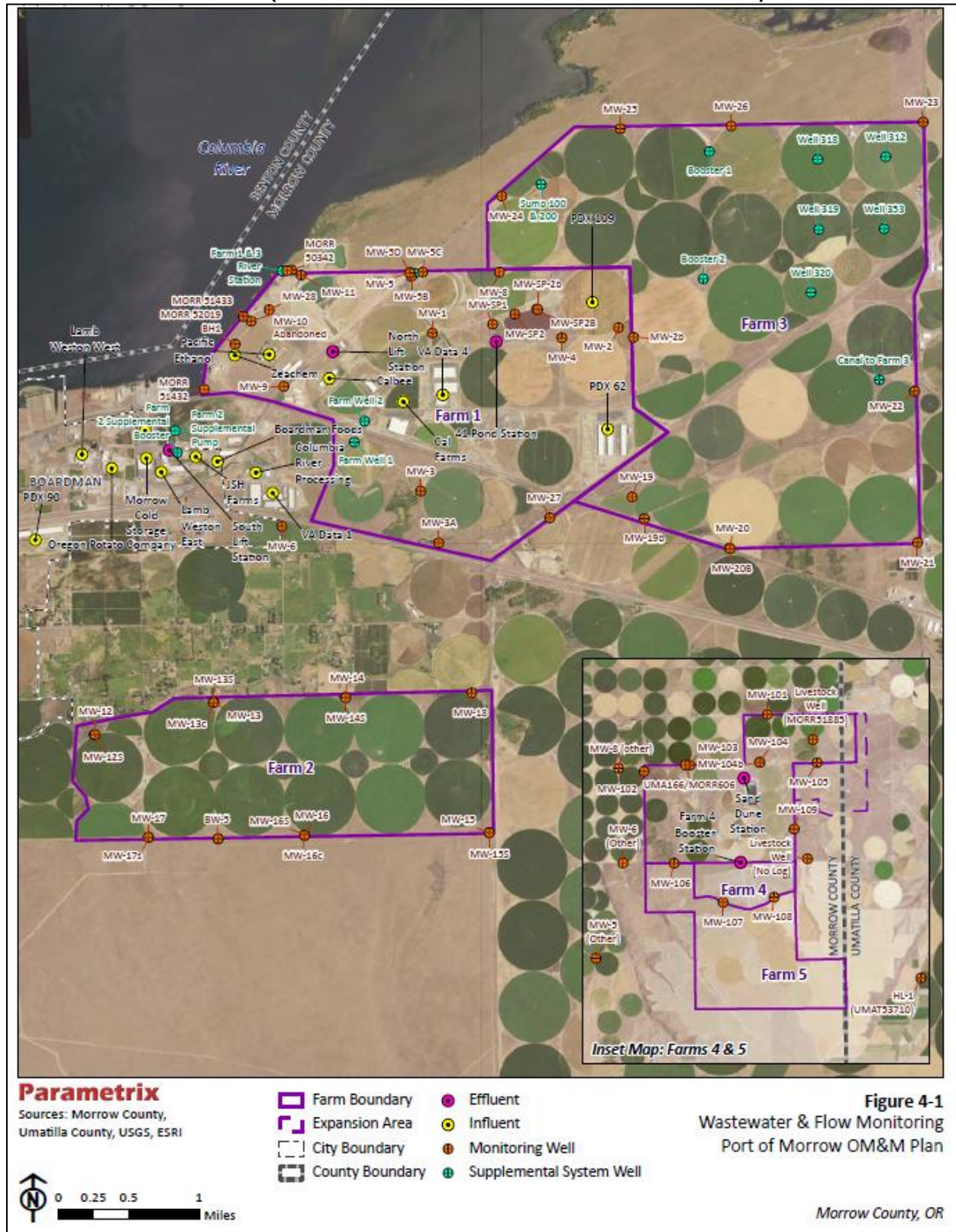


Figure 4 – Port of Morrow Land Application Area Boundaries and Monitoring Detail (Source: 2024 Port of Morrow OM&M Plan)



3. Permit Modification Discussion

The following section details changes made to the permit proposed by this modification, by each section of the permit.

3.1 Schedule A – Waste Disposal Terms and Conditions

3.1.5 Authorized Land Application Sites

Condition (5) prohibits application of wastewater at any other location other than the sites listed in the facility OM&M Plan, which must be approved by DEQ.

Specific circle numbers and Farm names have been removed from the permit modification and must be listed in the facility OM&M plan as these can change and may be expanded or reduced during the permit term.

3.1.8 Nitrogen Availability and Loading

Condition (8)(A-G) establishes the definition of, and the elements that must be included when calculating total nitrogen available to a crop. The modified permit adds language to (8)(D) to require tracking of application of nitrate in both wastewater and supplemental irrigation water. Manure application and additional sources of nitrogen loading must be calculated and included in available Nitrogen loading under Condition 8(F).

Organic nitrogen will be broken down in the anaerobic digester to more plant available ammonia/ammonium thus, upon completion of the project all total nitrogen will be required to be calculated and factored into loading (removing the 70% TKN allowance for mineralization) for wastewater treated by primary and secondary treatment units unless otherwise approved by DEQ.

The facility must provide and keep current a Nitrogen Balance as part of the system capacity assessment required in the OM&M Plan and this language has been added as a condition. This balance must demonstrate adequate capacity is available for the permittee to store and land apply wastewater within the provisions of this permit.

3.1.11 Leaching Prohibition

Condition (11) prohibits leaching past the 5th foot of the soil profile as caused by irrigation as demonstrated by required moisture monitoring. This section was updated for clarification on soil moisture monitoring, which is required to be enhanced by this permit action, per Schedule D. Methods for measuring soil moisture, calibration of probes, and assessments across the field based on the network of sensors is further described in the facility's OM&M plan required to be adhered to as a permit condition.

3.1.13 Non-Growing Season Limits

This section provides limits in place until non-growing season irrigation with untreated wastewater is ceased according the compliance schedule due date. The schedule to cease non-growing irrigation has been moved up one full year by this permit action and the POM has

worked expeditiously to move ahead of the initially required permit schedule of November 1, 2026.

This section received updates on how the facility will be required to manage non-growing season irrigation for one more period of November 1, 2024 – February 28, 2025. The updated nitrogen tracking regimen replaces the 4th and 5th foot nitrate limits with a risk based system for nitrate through the entire five foot rooting zone. Irrigation activities are required to retain moisture in the top three feet to minimize leaching until the practice is ceased and additional soil moisture sensors are proposed to be put into place by the facility and mandated by the permit conditions.

The permit language is now explicit on prohibiting irrigation of high risk fields to groundwater receptors and based on soil moisture and nitrate leaching potential. The facility and consultants provided a technical memorandum as basis for the permit modification request (see Appendix III), and DEQ agrees that the proposed practice is acceptable to minimize leaching risk for the next winter period, until the practice is ceased by November 1, 2025 with the addition of the two large 750 million-gallon lined storage systems.

3.1.14 Effluent Treatment and Storage

This condition mandates treatment of land applied wastewater for the period of November through February each year upon completion of the secondary treatment system. Treated effluent must meet specific wastewater effluent limits below drinking water standards for nitrate during the non-growing season for any proposed beneficial uses if not stored fully. The permittee must use the treatment system in the growing season to ensure permit compliance – by reducing nitrogen, organic material, and preventing nuisance conditions.

The total nitrogen limit is set at 7 mg/L as a protective measure to be below the drinking water MCL (10mg/L for nitrate-nitrogen) and at the 70% MCL that declares a GWMA and are to be met for the winter irrigation activity classified as disposal.

BOD, TSS and pH limits were set at applicable federal secondary treatment standards.

The facility must meet these limits and concurrently ensure site practices do not cause degradation of waters of the state (groundwater) by land application activities.

Due to delays in supply chain, bidding, and cost, the secondary treatment system currently required in the permit by November 1, 2025 is proposed to be delayed to 2029. However, the storage addition is proposed to be moved up one full year to cease the winter irrigation program earlier.

Beneficial uses of treated wastewater (for example field preparation, limited dust control, crop uptake in the shoulder months) in the non-growing season after November 1, 2025 may only occur with highly treated effluent and only as approved by DEQ on limited basis.

3.2 SCHEDULE B - MONITORING AND REPORTING REQUIREMENTS

3.2.3 Visual Inspections

Condition (3) requires visual inspections of the system on an established minimum frequency. The reference to specific lagoons has been removed due to the facility working to add two new lined storage lagoons during the permit term. The facility will be required to inspect each lagoon, and to record the amount of stored effluent in each lagoon, on a daily basis.

3.2.4 Flow Monitoring

Conditions (4) (B) - (D) were updated to reference new farm name conventions and remove reference to specific lagoon names due to the addition of the upcoming winter storage lagoons. Language included so that if additional area is added through permit action, monitoring will be required in accordance with established farm areas.

3.2.6 Commercial Fertilizer and Additional Nitrogen Sources

Condition (6) and Table B9 establishes recordkeeping requirements for tracking commercial fertilizer applied to authorized application sites. Reference to specific farm names is removed with a statement instead that tracking must be done for each farm.

3.2.14 Facility Monthly Report

Condition (14) (A) – (I) requires submittal of a monthly monitoring report that must include specific information. Footnote 1 was edited to reference each lagoon rather than Pond 41 and the Sand Dune Lagoon specifically, due to the POM bringing online new storage lagoons in the required permit schedule.

3.3 SCHEDULE C- COMPLIANCE CONDITIONS AND SCHEDULES

The compliance schedule has been modified as follows. Schedule C, Conditions 1, 2, 3, and 6 of the November 2, 2022 permit have not been modified.

4. Secondary Treatment of Wastewater Effluent

Complete By	Requirement
December 31, 2022 September 1, 2025	Submit a Preliminary Design Report to DEQ for review of Secondary Treatment System. The preliminary design report must include nitrogen and hydraulic balances to document system capacity upon completion of the project.
July 30, 2023 April 1, 2026	Submit 90% Plans and Specifications to DEQ for review of Secondary Treatment System. The 90% plans must address all DEQ comments on the Preliminary Design Report.
December 31, 2023 December 31, 2026	The permittee must submit to DEQ: 1. Final draft plans and specifications in accordance with OAR 340-052 for a selected secondary treatment system. 2. A completed Land Use Compatibility Statement (LUCS) for the selected project.
April 1, 2027	Submit to DEQ a progress status report.
April 1, 2028	Submit to DEQ a progress status report.
April 1, 2029	Submit to DEQ a progress status report.
July 1, 2029	Complete construction and startup of the secondary treatment system as per the DEQ-approved plans and specifications.
October 1, 2029	Submit to DEQ a summary of performance for the Secondary Treatment System. The summary must include a comparison of the wastewater characteristics in Table B8 before and after secondary treatment.
November 1, 2029	The permittee must comply with Schedule A(14) effluent limits for wastewater land applied in the non-growing season and use the secondary treatment system in the growing season to ensure permit compliance and groundwater protection.

5. Storage of Non-Growing Season Effluent

Complete By	Requirement
May 31, 2023	Submit Preliminary Design Report to DEQ for review of Storage Addition to cease non-growing season disposal program. The preliminary design must include nitrogen and hydraulic balances to document system capacity upon completion of the project.
November 30, 2023	Submit 90% Plans and Specifications to DEQ for review of Storage Addition. The 90% plans must address all DEQ comments on the Preliminary Design Report.
April 1, 2024	The permittee must submit to DEQ: 1. Final draft plans and specifications in accordance with OAR 340-052 for the storage system. 2. A completed Land Use Compatibility Statement (LUCS) for the selected project.
April 1, 2025	Submit to DEQ a progress status report.
November 1, 2026 November 1, 2025	The permittee must complete construction and provide DEQ a start-up summary for the project in accordance with DEQ approval. Any wastewater applied during the non-growing season after this date, must be treated to Schedule A(14) effluent limits and for defined beneficial use as described in the facility OM&M plan and approved by DEQ.

7. Groundwater Corrective Measures and Remedial Actions

Complete By	Requirement
March 31, 2025	Submit an update to the August 29, 2023 Farms 1-5 Remedial Investigation/Feasibility Study and Corrective Measures Plan. The updated plan must include: 1. A summary of current groundwater monitoring trend analysis at Farms 1, 2, 3, 4, and 5. 2. A summary of groundwater trend analysis and proposed groundwater concentration limits at the acreage expansion for Farm 6. 3. All RI/FS information required under OAR 340-040-0040. 4. An update on corrective actions completed and identification of new proposed corrective actions as necessary, to include the new Farm 6 acreage.

8. Responsibility to Meet Compliance Dates

No later than 14 days following each compliance date listed in the tables above, the permittee must notify DEQ in writing of its compliance or noncompliance with the requirements. Any reports of noncompliance must include the cause of noncompliance, any remedial actions taken, and a discussion of the likelihood of meeting the next scheduled requirement.

3.4 SCHEDULE D- SPECIAL CONDITIONS

This section of the fact sheet only addresses Schedule D conditions that are proposed to be altered as part of this permit modification.

3.4.13 Total Kjeldahl Nitrogen Availability

Condition (13) has been updated.

3.4.17 Soil Moisture Monitoring Sensor Density and Calibration

Condition (17) is new. By November 1, 2024, the facility must install additional soil moisture monitoring sensors at all fields potentially receiving non-growing season irrigation at a minimum density of one sensor per twenty-five acres. The facility must provide written verification of completion of the additional soil moisture sensors prior to the November 1, 2024 non-growing season period. Sensors must be installed and calibrated in accordance with the OM&M Plan and used to assess permit non-growing season and leaching compliance as per the approved OM&M.

By no later than the April 15th, 2025 OM&M plan update, the facility must provide a plan and schedule to begin assessing site soil field capacity using additional verified methodology of 1) the Saxton and Rawls Method (Saxton and Rawls 2006), or 2) the pressure plate method. The facility may propose other methods along with information to support the requested approach.

4. Schedule F

This section contains standard conditions applicable to all WPCF permits of similar scope and size. No changes are proposed to this section in this modification action.

5. Conclusion

DEQ supports the POM request to modify the WPCF permit and has also added further provisions necessary for the facility to adequately enhance groundwater protections. DEQ appreciates the facility's efforts to date in meeting the requirements of the permit and MAO and expects the facility to continue progress for adding storage and treatment infrastructure. The updated permit conditions result in greater protections as the facility continues working on the required compliance schedule improvements.

DEQ proposes to modify the permit according to procedures under OAR 340-045.

BEFORE THE ENVIRONMENTAL QUALITY COMMISSION

OF THE STATE OF OREGON

IN THE MATTER OF
PORT OF MORROW,

Respondent.

MUTUAL AGREEMENT
AND FINAL ORDER

CASE NO. WQ/I-ER-2021-106

WHEREAS:

1. On January 10, 2022, the Department of Environmental Quality (DEQ) issued Notice of Civil Penalty Assessment and Order No. WQ/I-ER-2021-106 (the Notice) to Respondent. DEQ assessed a \$1,291,551 civil penalty against Respondent for violations alleged in the Notice.
2. On January 28, 2022, Respondent filed a timely request for hearing.
3. On June 16, 2022, the Department of Environmental Quality (DEQ) issued Amended Notice of Civil Penalty Assessment and Order No. WQ/I-ER-2021-106 (the Amended Notice) to Respondent. DEQ assessed a \$2,100,351 civil penalty against Respondent for violations alleged in the Amended Notice.

I. AGREEMENT

Respondent and DEQ hereby agree that:

1. This Mutual Agreement and Final Order (MAO) shall be effective upon the date fully executed.
2. During the 2022-23 winter irrigation season, Respondent violated Schedule A, Condition 13(A)(ii) of its Water Pollution Control Facilities Permit, as modified effective November 2, 2022, (the Permit) on 228 occasions by applying wastewater containing nitrogen during the winter irrigation season to fields where soil nitrate in the 4 feet to 5 feet soil level was equal to or greater than 30 pounds per acre, as described in Respondent's Operations, Monitoring and Management (OM&M) Report submitted to DEQ on April 14, 2023 (the Annual Report). These are Class I violations, according to OAR 340-012-0055(1)(m).

1 3. Amended Exhibit 1 of the Amended Notice is amended by reducing the mental state,
2 or “M” factor, finding from reckless to negligent, and correspondingly, the value of the “M” factor
3 from 8 to 4. This initially reduces the penalty assessed for Violation 1 of the Amended Notice from
4 \$1,469,400 to \$1,279,800. The penalty calculation is further revised by assessing an additional 21
5 base penalties for a total of 100 base penalties assessed for violations occurring during the 2018-19,
6 2019-20, 2020-21, 2021-22 and 2022-23 winter irrigation seasons, increasing the total civil penalty
7 for Violation 1 to \$1,620,000. The amended findings and determinations of the civil penalty are
8 attached and incorporated as Exhibit 1 - Amendment 3.

9 4. During the 2022-23 winter irrigation season, Respondent violated Schedule A,
10 Condition 13(A)(iii) of the Permit on 520 occasions by applying wastewater containing nitrogen
11 during the winter irrigation season to fields where soil moisture in the 4th foot of the soil profile
12 was equal to or greater than 75% of the 4th foot water-holding capacity as detailed in the Annual
13 Report. These are Class I violations, according to OAR 340-012-0055(1)(m).

14 5. Amended Exhibit 2 of the Amended Notice is amended by reducing the mental state,
15 or “M” factor, finding from reckless to negligent, and correspondingly, the value of the “M” factor
16 from 8 to 4. This initially reduces the penalty assessed for Violation 2 of the Amended Notice from
17 \$567,800 to \$483,000. The penalty calculation is further revised by assessing an additional 9 base
18 penalties for a total of 44 base penalties assessed for violations occurring during the 2021-22 and
19 2022-23 winter irrigation seasons increasing the total penalty for Violation 2 to \$607,200. The
20 amended findings and determination of the civil penalty is attached and incorporated as Exhibit 2 –
21 Amendment 3.

22 6. Amended Exhibit 3 of the Amended Notice is unchanged by this MAO. The total
23 civil penalty for Violation 3 is \$63,951.

24 7. On January 15, March 17, March 19, April 20, June 3, June 8, June 14, July 31,
25 September 30, and October 16, 2023, Respondent violated ORS 468B.025(2) when it violated
26 Schedule A, Condition 7 of the Permit by disposing of wastewater in a manner not in accordance
27 with Respondent’s OM&M plan. Specifically, Respondent discharged effluent to the ground

1 surface from leaks in, respectively, two separate leaks from the wastewater pipeline from the South
2 Lift Station to Pond 41, the wastewater pipeline passing through Circle 319, the wastewater feeder
3 pipeline serving Circle 320, two separate leaks in the Sand Dune wastewater pipeline, a pump leak
4 at the new Digester #3 cell, a leak in the south lift line, an irrigation mainline break at Farm 3, Circle
5 330, and a leak in the south lift line near the pump station. These are Class II violations pursuant to
6 OAR 340-012-0053(2)(a). DEQ assesses a \$60,000 civil penalty for these violations. The
7 determination of the civil penalty is attached and incorporated as Exhibit 4.

8 8. During 2022, Respondent violated Schedule A, Condition 8 of the Permit on 18
9 occasions by applying nitrogen-containing wastewater to fields where the nitrogen from all sources
10 exceeded the agronomic rate for the crop grown, as detailed in the Annual Report. These are Class I
11 violations pursuant to OAR 340-012-0055(1)(m). DEQ assesses a \$66,000 civil penalty for these
12 violations. The findings and determination of the civil penalty is attached as Exhibit 5.

13 9. Respondent violated Schedule B, Condition 5 of the Permit by failing to conduct
14 effluent monitoring for total suspended solids during the week of November 13, 2022. This is a
15 Class I violation pursuant to OAR 340-12-0055(1)(o). This violation is resolved without penalty.

16 10. During the 2022-23 winter irrigation season, Respondent violated Schedule A,
17 Condition 11 of the Permit, which prohibits the leaching of moisture and nutrients beyond the 5th
18 foot of the soil column, on 41 occasions, as described in the Annual Report. These are Class I
19 violations pursuant to OAR 340-012-0055(1)(m). These violations are resolved without penalty.

20 11. The total civil penalty for the violations alleged in the Amended Notice and Section
21 I, Paragraphs 2, 4, 7 and 8 of this MAO is \$2,417,151.

22 12. Pursuant to OAR 340-012-0030(19) and OAR 340-012-0145(2), the violations
23 alleged in the Amended Notice and this MAO will be treated as prior significant actions in the event
24 a future violation occurs.

25 13. Respondent waives any and all rights and objections Respondent may have to the
26 form, content, manner of service and timeliness of the Notice; to a contested case hearing and
27 judicial review of the Notice; and to service of a copy of this MAO.

1 14. This MAO resolves all civil claims of DEQ, based upon the facts alleged, for the
2 violations expressly alleged in the Amended Notice as amended by this MAO. This MAO is not
3 intended to limit, in any way, DEQ's right to proceed against Respondent in any forum for any past
4 or future violations not expressly settled herein.

5 15. Respondent releases and waives any and all claims of any kind, known or unknown,
6 past or future, against the State of Oregon or its agencies, instrumentalities, employees, officers, or
7 agents, arising out of the matters and events set out in the Amended Notice and this MAO. Any and
8 all claims includes but is not limited to any claim under 42 USC § 1983 et seq., any claim under
9 federal or state law for damages, declaratory, or equitable relief, and any claim for attorney's fees or
10 costs.

11 16. This MAO shall be binding on Respondent and its respective successors, agents, and
12 assigns. The undersigned representative of Respondent certifies that they are fully authorized to
13 execute and bind Respondent to this MAO. No change in ownership, corporate or partnership status
14 of Respondent, or change in the ownership of the properties or businesses affected by this MAO
15 shall in any way alter Respondent's obligation under this MAO, unless otherwise approved in
16 writing by DEQ through an amendment to this MAO.

17 17. Verifiable electronic, facsimile, or scanned signatures on this MAO shall be treated
18 the same as original signatures.

19 18. The terms of this MAO may be amended by mutual agreement of DEQ and
20 Respondent.

21 19. If any event occurs that is beyond Respondent's reasonable control and that may
22 cause a delay or deviation in Respondent's satisfactorily completing the requirements contained in
23 Section II, paragraph 2, despite Respondent's reasonable efforts ("Force Majeure"), Respondent
24 will promptly, upon learning of the event, notify DEQ verbally of the cause of the delay or
25 deviation, its anticipated duration, the measures that have been taken to prevent or minimize the
26 delay or deviation, and the timetable by which Respondent proposes to carry out such measures.
27 Respondent will confirm in writing this information within five working days of the verbal

1 notification. Failure to comply with these notice requirements precludes Respondent from asserting
2 Force Majeure for the event and for any additional delay that it causes. If Respondent demonstrates
3 that the delay or deviation has been or will be caused by a Force Majeure, DEQ will extend the
4 times for performance of the affected requirements in Section II, paragraph 2, as appropriate, and
5 such delays or deviations caused by a Force Majeure shall not constitute a violation of this MAO.
6 Circumstances or events constituting a Force Majeure might include, without limitation, acts of
7 God, unforeseen strikes or work stoppages, unanticipated site conditions, fire, explosion, riot,
8 sabotage, war, unavailability of parts or equipment, contractor unavailability, and delays in
9 receiving a governmental approval or permit. Normal inclement weather, a consultant's failure to
10 provide timely reports, increased cost of performance, or changed business or economic
11 circumstances may not be considered Force Majeure.

12 20. If Respondent fails to satisfactorily complete the requirements contained in
13 Section II, paragraph 2, upon receipt of a written Penalty Demand Notice from DEQ, Respondent
14 shall pay a civil penalty of \$2,400 for each day of each violation of this MAO until such violation is
15 corrected.

16 21. For violations of the soil nitrate and soil moisture requirements established in
17 Schedule A, Conditions 13(A)(ii), (iii), and (iv) or the leaching prohibition in Schedule A,
18 Condition 11 of the Permit during the non-growing seasons of 2023-2024 and 2024-2025, upon
19 receipt of a written Penalty Demand Notice from DEQ, Respondent shall pay a civil penalty of

20 a. \$750 for each violation occurring at an application site identified as low risk in
21 Appendix A of the attached Compliance Plan,

22 b, \$3,750 for each violation occurring at an application site identified as medium risk
23 in Appendix A of the attached Compliance Plan, and

24 c. \$7,500 for each violation occurring at an application site identified as high risk in
25 Appendix A of the attached Compliance Plan.

1 With the approval of DEQ, Respondent may reduce any penalty due under this section by up to
2 eighty percent through contributing to the SEP described in this MAO or to another SEP approved
3 by DEQ.

4 22. For violations of Schedule A, Condition 7 of the Permit resulting from the discharge
5 of wastewater from Respondent's pipelines to the ground surface occurring from the effective date
6 of this MAO until November 1, 2025, upon receipt of a written Penalty Demand Notice from DEQ,
7 Respondent shall pay a civil penalty of

8 a. \$0 for discharges of less than 400 gallons where Respondent has promptly notified
9 DEQ and cleaned up the discharge.

10 b. \$600 for discharges under 5,000 gallons.

11 c. \$1,200 for discharges of 5,000 gallons or more but less than 50,000 gallons.

12 d. \$2,400 for discharges of 50,000 gallons or more.

13 23. Within twenty (20) days of receipt of a Penalty Demand Notice from DEQ,
14 Respondent may contest the Penalty Demand Notice. Respondent agrees that the issue shall be
15 limited to Respondent's compliance or noncompliance with this MAO. The amount of the
16 stipulated civil penalty is established in advance by this MAO and is not a contestable issue.

17 24. In accordance with DEQ's Internal Management Directive on Supplemental
18 Environmental Projects (SEPs), DEQ agrees to mitigate the \$2,417,151 total civil penalty for the
19 violations cited in the Amended Notice and this MAO to \$483,430 on the condition Respondent
20 completes the attached Supplemental Environmental Project (SEP), approved by DEQ, and which is
21 incorporated into this MAO by reference, by January 31, 2028. Respondent will be deemed to have
22 completed the SEP when DEQ receives a report from the Oregon Health Authority (OHA)
23 confirming that it received \$1,933,721 from Respondent and expended the money in the manner
24 prescribed in the approved SEP proposal.

25 25. Respondent agrees to refrain from using the value of the approved SEP as a tax
26 deduction or as part of a tax credit application; and, whenever Respondent publicizes the SEP or the
27

1 results of the SEP, Respondent will state in a prominent manner that the project was undertaken as
2 settlement of a DEQ enforcement action.

3 26. Within 30 days of receipt of a written expenditure report submitted by OHA in
4 accordance with Paragraph 5.b of the SEP Funding Agreement between OHA and Respondent,
5 DEQ will issue a written determination that SEP funds accounted for in the report were or were not
6 expended in a manner consistent with the SEP proposal. A determination by DEQ that funds were
7 expended consistent with the SEP is final and DEQ may not later seek payment of the amount of
8 those funds as civil penalty pursuant to Section II, Paragraph 3 of this MAO.

9 27. Civil penalty payments made pursuant to this MAO should be made as follows:
10 send a check or money order made payable to "Department of Environmental Quality" to DEQ -
11 Business Office, 700 NE Multnomah Street, Suite #600, Portland, Oregon 97232. Please include
12 the case number on the check or money order.

13 28. This MAO terminates on January 31, 2028, or when DEQ receives the SEP
14 completion documentation report required by Paragraph 24, above, whichever occurs first,
15 except that the MAO shall not terminate before November 1, 2025.

16 29. By entering into this MAO, paying any sum due pursuant to this MAO, or taking
17 any other action required or agreed to pursuant to this MAO, Respondent does not admit, and
18 nothing in this MAO is to be construed as an admission of, any factual allegations, legal
19 conclusions, or liability herein or otherwise related to this MAO or the Amended Notice and the
20 exhibits thereto.

21 II. FINAL ORDER

22 The Environmental Quality Commission hereby enters a final order:

23 1. Imposing upon Respondent a total civil penalty of \$2,417,151, subject to mitigation
24 to \$483,430 in accordance with Section I, Paragraph 24, above, for the violations alleged in the
25 Amended Notice and Section I, Paragraphs 2, 4, 7 and 8 of this MAO. Payment of the civil penalty
26 not subject to mitigation through the SEP, \$483,430, is due upon execution of this MAO.

27 2. Requiring Respondent to:

1 a. Implement and comply with the Compliance Plan, attached and incorporated into
2 this MAO, until November 1, 2025. A violation of the Compliance Plan is a violation of this MAO.

3 b. Comply with the following corrective action schedule:

4 i) By November 30, 2023, provide final signed/stamped engineering design
5 drawings and LUCS in accordance with OAR 340-052 to DEQ for review for the South Lift Station
6 to Pond #41 wastewater pipeline replacement project.

7 ii) By May 1, 2024, complete construction and startup of the replacement line
8 from the current POM South Lift Station to Pond #41 and decommission the former line.

9 3. Requiring Respondent to submit documentation required in Section I, Paragraph 24
10 above; otherwise, any funds not expended in a manner consistent with the SEP up to the total
11 remaining civil penalty, \$1,933,721, is due and owing to DEQ on January 31, 2028.

12
13 PORT OF MORROW

14 10/31/23
15 Date

Signature

16 Lisa Mittelsdorf
17 Name (print)

18 Executive Director
19 Title (print)

20
21 DEPARTMENT OF ENVIRONMENTAL QUALITY and
22 ENVIRONMENTAL QUALITY COMMISSION

23 10/31/2023
24 Date

25 Kieran O'Donnell, Manager
26 Office of Compliance and Enforcement
27 on behalf of DEQ pursuant to OAR 340-012-0170
on behalf of the EQC pursuant to OAR 340-011-0505

EXHIBIT 1 – AMENDMENT 3

FINDINGS AND DETERMINATION OF RESPONDENT'S CIVIL PENALTY PURSUANT TO OREGON ADMINISTRATIVE RULE (OAR) 340-012-0045

<u>VIOLATION NO. 1</u>	Failure to comply with a wastewater permit condition in violation of ORS 468B.025(2) by failing to comply with Schedule A, Condition 13(c)(ii) of the Permit (renumbered Condition 13(A)(ii) effective November 2, 2022) regarding winter irrigation of effluent.
<u>CLASSIFICATION:</u>	This is a Class I violation pursuant to OAR 340-012-0055(1)(m).
<u>MAGNITUDE:</u>	The magnitude of the violation is moderate pursuant to OAR 340-012-0130(1), as there is no selected magnitude specified in OAR 340-012-0135 applicable to this violation, and the information reasonably available to DEQ does not indicate a minor or major magnitude.
<u>CIVIL PENALTY FORMULA:</u>	The formula for determining the amount of penalty of each violation is: $BP + [(0.1 \times BP) \times (P + H + O + M + C)] + EB$
"BP"	is the base penalty, which is \$6,000 for a Class I, moderate magnitude violation in the matrix listed in OAR 340-012-0140(2)(b)(A)(ii) and applicable pursuant to OAR 340-012-0140(2)(a)(E)(ii) because Respondent has a Tier 1 industrial source WPCF permit.
"P"	is whether Respondent has any prior significant actions, as defined in OAR 340-012-0030(19), in the same media as the violation at issue that occurred at a facility owned or operated by the same Respondent, and receives a value of 10 pursuant to OAR 340-012-0145(2)(a) because Respondent has prior significant actions consisting of 9 or more Class I equivalent violations stemming from Case Nos. WQ/I-ER-15-105 and WQ/I-ER-2016-108.
"H"	is Respondent's history of correcting prior significant actions and receives a value of 0 according to OAR 340-012-0145(3)(c) because there is insufficient information on which to base a finding under paragraphs (3)(a) or (b).
"O"	is whether the violation was repeated or ongoing and receives a value of 3 pursuant to OAR 340-012-0145(4)(c) because there were seven or more, but less than 28 occurrences of the violation. Each day of application on each farm and field number in violation of the permit condition represents a separate occurrence. Respondent applied on 1,761 occurrences in violation of the permit during the 2018-19, 2019-20, 2020-21, 2021-22 and 2022-23 winter irrigation seasons. DEQ is assessing a separate penalty for 100 of the violations. To arrive at "O," DEQ divides the total number of violations by the number of violations penalized. Therefore, each assessed penalty represents 17.6 occurrences for an "O" factor value of 3.

"M" is the mental state of the Respondent and receives a value of 4 according to OAR 340-012-0145(5)(c) because Respondent's conduct was negligent. The soil nitrate limit is an express condition of Respondent's Permit. By failing to take the action necessary to comply with the limit, Respondent failed to exercise reasonable care to avoid the foreseeable risk of committing the violation.

"C" is Respondent's efforts to correct or mitigate the violation and receives a value of 0 according to OAR 340-012-0145(6)(f) because the violation or the effects of the violation could not be corrected or minimized.

"EB" is the approximate dollar value of the benefit gained and the costs avoided or delayed as a result of the Respondent's noncompliance. It is designed to "level the playing field" by taking away any economic advantage the entity gained and to deter potential violators from deciding it is cheaper to violate and pay the penalty than to pay the costs of compliance. In this case, "EB" receives a value of \$0 as DEQ has insufficient information on which to arrive at reasonable estimation of compliance costs avoided or delayed.

SINGLE OCCURRENCE PENALTY CALCULATION: $\text{Penalty} = \text{BP} + [(0.1 \times \text{BP}) \times (\text{P} + \text{H} + \text{O} + \text{M} + \text{C})]$
 $= \$6,000 + [(0.1 \times \$6,000) \times (10 + 0 + 3 + 4 + 0)]$
 $= \$6,000 + [\$600 \times 17]$
 $= \$6,000 + \$10,200 = \$16,200$

MULTIPLE PENALTY CALCULATION

Single occurrence penalty calculation x number of violations penalized + economic benefit

In exercising its enforcement discretion, DEQ elects to assess separate base penalties for 100 of the 1,761 occurrences of the violation.

FINAL PENALTY CALCULATION

$\$16,200 \times 100 + \$0 = \$1,620,000$

EXHIBIT 2 – AMENDMENT 3

FINDINGS AND DETERMINATION OF RESPONDENT'S CIVIL PENALTY PURSUANT TO OREGON ADMINISTRATIVE RULE (OAR) 340-012-0045

VIOLATION NO. 2 Failure to comply with a wastewater permit condition in violation of ORS 468B.025(2) by failing to comply with Schedule A, Condition 13(c)(iii) of the Permit (renumbered Condition 13(A)(iii) effective November 2, 2022) regarding winter irrigation of effluent.

CLASSIFICATION: This is a Class I violation pursuant to OAR 340-012-0055(1)(m).

MAGNITUDE: The magnitude of the violation is moderate pursuant to OAR 340-012-0130(1), as there is no selected magnitude specified in OAR 340-012-0135 applicable to this violation, and the information reasonably available to DEQ does not indicate a minor or major magnitude.

CIVIL PENALTY FORMULA: The formula for determining the amount of penalty of each violation is: $BP + [(0.1 \times BP) \times (P + H + O + M + C)] + EB$

"BP" is the base penalty, which is \$6,000 for a Class I, moderate magnitude violation in the matrix listed in OAR 340-012-0140(2)(b)(A)(ii) and applicable pursuant to OAR 340-012-0140(2)(a)(E)(ii) because Respondent has a Tier 1 industrial source WPCF permit.

"P" is whether Respondent has any prior significant actions, as defined in OAR 340-012-0030(19), in the same media as the violation at issue that occurred at a facility owned or operated by the same Respondent and receives a value of 6 pursuant to OAR 340-012-0145(2). P is assigned an initial value of 10 because Respondent has prior significant actions (PSAs) consisting of 9 or more Class I equivalent violations stemming from Case Nos. WQ/I-ER-15-105 and WQ/I-ER-2016-108. This value is reduced by 4 pursuant to OAR 340-012-0145(2)(d)(A)(ii) for a final value of 6 because the formal enforcement actions in which Respondent's PSAs were cited were issued more than five years before the violation.

"H" is Respondent's history of correcting prior significant actions, and receives a value of 0 according to OAR 340-012-0145(3)(c) because there is insufficient information on which to base a finding under paragraphs (3)(a) or (b).

"O" is whether the violation was repeated or ongoing and receives a value of 3 pursuant to OAR 340-012-0145(4)(c) because there were seven or more but less than 28 occurrences of the violation. Respondent applied on 778 occurrences in violation of the Permit during the 2021-22 and 2022-23 winter irrigations seasons. DEQ is assessing a separate penalty for 44 occurrences of the violations. To arrive at "O" DEQ divides the total number of violations by the number of violations penalized. Therefore, each assessed penalty represents 17.7 occurrences for an "O" factor value of 3.

- "M" is the mental state of the Respondent and receives a value of 4 according to OAR 340-012-0145(5)(c) because Respondent's conduct was negligent. The soil moisture content limit is an express condition of Respondent's Permit. By failing to take the action necessary to comply with the Permit, Respondent failed to exercise reasonable care to avoid the foreseeable risk of committing the violation.
- "C" is Respondent's efforts to correct or mitigate the violation, and receives a value of 0 according to OAR 340-012-0145(6)(f) because the violation or the effects of the violation could not be corrected or minimized.
- "EB" is the approximate dollar value of the benefit gained and the costs avoided or delayed as a result of the Respondent's noncompliance. It is designed to "level the playing field" by taking away any economic advantage the entity gained and to deter potential violators from deciding it is cheaper to violate and pay the penalty than to pay the costs of compliance. In this case, "EB" receives a value of \$0 as DEQ has insufficient information on which to arrive at reasonable estimation of compliance costs avoided or delayed.

SINGLE OCCURRENCE PENALTY CALCULATION: $\text{Penalty} = \text{BP} + [(0.1 \times \text{BP}) \times (\text{P} + \text{H} + \text{O} + \text{M} + \text{C})]$

$$= \$6,000 + [(0.1 \times \$6,000) \times (6 + 0 + 3 + 4 + 0)]$$

$$= \$6,000 + [\$600 \times 13]$$

$$= \$6,000 + \$7,800$$

$$= \$13,800$$

MULTIPLE PENALTY CALCULATION

Single occurrence penalty calculation x number of violations penalized + economic benefit

In exercising its enforcement discretion, DEQ elects to assess separate base penalties for 44 of the 778 occurrences of the violation.

FINAL PENALTY CALCULATION

$\$13,800 \times 44 + \$0 = \$607,200$

AMENDED EXHIBIT 3

FINDINGS AND DETERMINATION OF RESPONDENT'S CIVIL PENALTY PURSUANT TO OREGON ADMINISTRATIVE RULE (OAR) 340-012-0045

VIOLATION NO. 3 Failure to comply with a wastewater permit condition in violation of ORS 468B.025(2) by failing to conduct monitoring required by Schedule B of the Permit.

CLASSIFICATION: This is a Class I violation pursuant to OAR 340-012-0055(1)(o).

MAGNITUDE: The magnitude of the violation is moderate pursuant to OAR 340-012-0130(1), as there is no selected magnitude specified in OAR 340-012-0135 applicable to this violation, and the information reasonably available to DEQ does not indicate a minor or major magnitude.

CIVIL PENALTY FORMULA: The formula for determining the amount of penalty of each violation is: $BP + [(0.1 \times BP) \times (P + H + O + M + C)] + EB$

"BP" is the base penalty, which is \$6,000 for a Class I, moderate magnitude violation in the matrix listed in OAR 340-012-0140(2)(b)(A)(ii) and applicable pursuant to OAR 340-012-0140(2)(a)(E)(ii) because Respondent has a Tier 1 industrial source WPCF permit.

"P" is whether Respondent has any prior significant actions, as defined in OAR 340-012-0030(19), in the same media as the violation at issue that occurred at a facility owned or operated by the same Respondent, and receives a value of 10 pursuant to OAR 340-012-0145(2)(a) because Respondent has prior significant actions consisting of 9 or more Class I equivalent violations stemming from Case Nos. WQ/I-ER-15-105 and WQ/I-ER-2016-108.

"H" is Respondent's history of correcting prior significant actions, and receives a value of 0 according to OAR 340-012-0145(3)(c) because there is insufficient information on which to base a finding under paragraphs (3)(a) or (b).

"O" is whether the violation was repeated or ongoing, and receives a value of 4 according to OAR 340-012-0145(4)(d) because there were more than 28 occurrences of the violation. Respondent failed to conduct annual plant tissue monitoring for nitrogen removal at 121 fields in 2018, 2019 and 2020 for a total of 363 occurrences of the violation. DEQ is assessing a separate penalty for three of the violations. To arrive at "O" DEQ divides the total number of violations by the number of violations penalized. Therefore, each assessed penalty represents 121 occurrences for an "O" factor value of 4.

"M" is the mental state of the Respondent, and receives a value of 4 according to OAR 340-012-0145(5)(c) because Respondent's conduct was negligent. The monitoring requirements are express conditions of Respondent's Permit. By failing to take the actions necessary to

conduct the monitoring, Respondent failed to exercise reasonable care to avoid the foreseeable risk of committing the violation.

"C" is Respondent's efforts to correct or mitigate the violation, and receives a value of 0 according to OAR 340-012-0145(6)(f) because the violation or the effects of the violation could not be corrected or minimized.

"EB" is the approximate dollar value of the benefit gained and the costs avoided or delayed as a result of the Respondent's noncompliance. It is designed to "level the playing field" by taking away any economic advantage the entity gained and to deter potential violators from deciding it is cheaper to violate and pay the penalty than to pay the costs of compliance. In this case, "EB" receives a value of \$13,551. This is the amount Respondent gained by avoiding \$19,602 in monitoring costs. This "EB" was calculated pursuant to OAR 340-012-0150(1) using the U.S. Environmental Protection Agency's BEN computer model.

SINGLE OCCURRENCE PENALTY CALCULATION: $\text{Penalty} = \text{BP} + [(0.1 \times \text{BP}) \times (\text{P} + \text{H} + \text{O} + \text{M} + \text{C})]$
 $= \$6,000 + [(0.1 \times \$6,000) \times (10 + 0 + 4 + 4 + 0)]$
 $= \$6,000 + (\$600 \times 18)$
 $= \$6,000 + \$10,800$
 $= \$16,800$

MULTIPLE PENALTY CALCULATION

(Single occurrence penalty calculation x number of violations penalized) + economic benefit

In exercising its enforcement discretion, DEQ elects to assess separate base penalties for 3 of the 363 occurrences of the violation, assessing a separate base penalty for each year Respondent committed the violation.

FINAL PENALTY CALCULATION

$(\$16,800 \times 3) + \$13,551 = \$63,951$

EXHIBIT 4

FINDINGS AND DETERMINATION OF RESPONDENT'S CIVIL PENALTY PURSUANT TO OREGON ADMINISTRATIVE RULE (OAR) 340-012-0045

VIOLATION NO. 4 Violating ORS 468B.025(2) by violating Schedule A, Condition 7 of the Permit by disposing of wastewater in a manner not in accordance with Respondent's OM&M plan.

CLASSIFICATION: This is a Class II violation pursuant to OAR 340-012-0053(2).

MAGNITUDE: The magnitude of the violation is moderate pursuant to OAR 340-012-0130(1), as there is no selected magnitude specified in OAR 340-012-0135 applicable to this violation, and the information reasonably available to DEQ does not indicate a minor or major magnitude.

CIVIL PENALTY FORMULA: The formula for determining the amount of penalty of each violation is: $BP + [(0.1 \times BP) \times (P + H + O + M + C)] + EB$

"BP" is the base penalty, which is \$3,000 for a Class II, moderate magnitude violation in the matrix listed in OAR 340-012-0140(2)(b)(B)(ii) and applicable pursuant to OAR 340-012-0140(2)(a)(E)(ii) as Respondent has a Tier I Industrial Source permit.

"P" is whether Respondent has any prior significant actions, as defined in OAR 340-012-0030(19), in the same media as the violation at issue that occurred at a facility owned or operated by the same Respondent and receives a value of 6 pursuant to OAR 340-012-0145(2). P is assigned an initial value of 10 because Respondent has prior significant actions (PSAs) consisting of 9 or more Class I equivalent violations stemming from Case Nos. WQ/I-ER-15-105 and WQ/I-ER-2016-108. This value is reduced by 4 pursuant to OAR 340-012-0145(2)(d)(A)(ii) for a final value of 6 because the formal enforcement actions in which Respondent's PSAs were cited were issued more than five years before the violation.

"H" is Respondent's history of correcting prior significant actions and receives a value of 0 according to OAR 340-012-0145(3)(c) because there is insufficient information on which to base a finding under paragraphs (3)(a) or (b).

"O" is whether the violation was repeated or ongoing and receives a value of 0 pursuant to OAR 340-012-0145(4)(e) because DEQ is assessing a separate penalty for each occurrence of the violation. There were ten occurrences of the violation, the wastewater pipeline leaks identified on January 15, March 17 and 19, April 20, June 3, 8 and 14, July 31, September 30, and October 16, 2023, as detailed in the MAO. Each penalty represents a single occurrence.

- "M" is the mental state of the Respondent and receives a value of 4 according to OAR 340-012-0145(5)(c) because Respondent's conduct was negligent. Respondent knew or should have known of the requirements of its OM&M plan. By failing to take the actions necessary to prevent the unpermitted discharges, Respondent failed to take reasonable care to avoid the foreseeable risk of committing the violation.
- "C" is Respondent's efforts to correct or mitigate the violation and receives a value of 0 according to OAR 340-012-0145(6)(f) because the violation or the effects of the violation could not be corrected or minimized.
- "EB" is the approximate dollar value of the benefit gained and the costs avoided or delayed as a result of the Respondent's noncompliance. It is designed to "level the playing field" by taking away any economic advantage the entity gained and to deter potential violators from deciding it is cheaper to violate and pay the penalty than to pay the costs of compliance. In this case, "EB" receives a value of \$0 as DEQ has insufficient information as to which measures Respondent would have taken to prevent the violations to arrive at a reasonable estimate of avoided or delayed compliance costs.

SINGLE OCCURRENCE PENALTY CALCULATION: $\text{Penalty} = \text{BP} + [(0.1 \times \text{BP}) \times (\text{P} + \text{H} + \text{O} + \text{M} + \text{C})]$

$$= \$3,000 + [(0.1 \times \$3,000) \times (6 + 0 + 0 + 4 + 0)]$$

$$= \$3,000 + (\$300 \times 10)$$

$$= \$3,000 + \$3,000$$

$$= \$6,000$$

MULTIPLE PENALTY CALCULATION

Single occurrence penalty calculation x number of violations penalized + economic benefit

In exercising its enforcement discretion, DEQ elects to assess separate base penalties for each of the ten occurrences of the violation.

FINAL PENALTY CALCULATION

$\$6,000 \times 10 + \$0 = \$60,000$

EXHIBIT 5

FINDINGS AND DETERMINATION OF RESPONDENT'S CIVIL PENALTY PURSUANT TO OREGON ADMINISTRATIVE RULE (OAR) 340-012-0045

VIOLATION NO. 5 Failure to comply with a wastewater permit condition in violation of ORS 468B.025(2) by failing to comply with Schedule A, Condition 8 of the Permit which prohibits application of nitrogen from all sources in excess of agronomic rates.

CLASSIFICATION: This is a Class I violation pursuant to OAR 340-012-0055(1)(m).

MAGNITUDE: The magnitude of the violation is moderate pursuant to OAR 340-012-0130(1), as there is no selected magnitude specified in OAR 340-012-0135 applicable to this violation, and the information reasonably available to DEQ does not indicate a minor or major magnitude.

CIVIL PENALTY FORMULA: The formula for determining the amount of penalty of each violation is: $BP + [(0.1 \times BP) \times (P + H + O + M + C)] + EB$

"BP" is the base penalty, which is \$6,000 for a Class I, moderate magnitude violation in the matrix listed in OAR 340-012-0140(2)(b)(A)(ii) and applicable pursuant to OAR 340-012-0140(2)(a)(E)(ii) because Respondent has a Tier 1 industrial source WPCF permit.

"P" is whether Respondent has any prior significant actions, as defined in OAR 340-012-0030(19), in the same media as the violation at issue that occurred at a facility owned or operated by the same Respondent and receives a value of 6 pursuant to OAR 340-012-0145(2). P is assigned an initial value of 10 because Respondent has prior significant actions consisting of 9 or more Class I equivalent violations stemming from Case Nos. WQ/I-ER-15-105 and WQ/I-ER-2016-108. That value is reduced by 4 pursuant to OAR 340-012-0145(2)(d)(A)(ii) as the formal enforcement actions in which the prior significant actions were cited were issued more than five years before the date the current violation occurred.

"H" is Respondent's history of correcting prior significant actions, and receives a value of 0 according to OAR 340-012-0145(3)(c) because there is insufficient information on which to base a finding under paragraphs (3)(a) or (b).

"O" is whether the violation was repeated or ongoing and receives a value of 2 pursuant to OAR 340-012-0145(4)(c) because there were more than one but less than seven occurrences of the violation per the violations penalized. There were 18 occurrences of the violation. DEQ assesses a separate penalty for 5 of the violations. To arrive at "O," DEQ divides the total number of violations by the number of violations penalized. Therefore, each assessed penalty represents 3.6 occurrences for an "O" factor value of 2.

"M" is the mental state of the Respondent and receives a value of 4 according to OAR 340-012-0145(5)(c) because Respondent's conduct was negligent. The agronomic limits are express conditions are an express condition of Respondent's Permit. By failing to take the action necessary to comply with the limit, Respondent failed to exercise reasonable care to avoid the foreseeable risk of committing the violation.

"C" is Respondent's efforts to correct or mitigate the violation, and receives a value of 0 according to OAR 340-012-0145(6)(f) because the violation or the effects of the violation could not be corrected or minimized.

"EB" is the approximate dollar value of the benefit gained and the costs avoided or delayed as a result of the Respondent's noncompliance. It is designed to "level the playing field" by taking away any economic advantage the entity gained and to deter potential violators from deciding it is cheaper to violate and pay the penalty than to pay the costs of compliance. In this case, "EB" receives a value of \$0 as DEQ has insufficient information on which to arrive at reasonable estimation of compliance costs avoided or delayed.

SINGLE OCCURRENCE PENALTY CALCULATION: $\text{Penalty} = \text{BP} + [(0.1 \times \text{BP}) \times (\text{P} + \text{H} + \text{O} + \text{M} + \text{C})]$
 $= \$6,000 + [(0.1 \times \$6,000) \times (6 + 0 + 2 + 4 + 0)]$
 $= \$6,000 + [\$600 \times 12]$
 $= \$6,000 + \$7,200 = \$13,200$

MULTIPLE PENALTY CALCULATION

Single occurrence penalty calculation x number of violations penalized + economic benefit

In exercising its enforcement discretion, DEQ elects to assess separate base penalties for 5 of the 18 occurrences of the violation.

FINAL PENALTY CALCULATION

$\$13,200 \times 5 + \$0 = \$66,000$



Supplemental Environmental Project Application

Oregon Department of Environmental Quality
Office of Compliance and Enforcement
700 NE Multnomah St., Suite 600
Portland OR 97232

Case Name and No.: Port of Morrow Case No. WQ/I-ER-2021-106

Project Contact: Gabriela Goldfarb, Gabriela.Goldfarb@oha.oregon.gov, 971-347-6147

Type of Project (choose one):

- ☐ **Pollution Prevention** – preventing waste or pollution at the source, by conserving energy or natural resources, or by making process changes (such as chemical substitutions) or by making a process more efficient so that less waste is created for a given amount of product.
- ☐ **Pollution Reduction** – reducing the amount and/or danger presented by some form of pollution, often by providing better treatment and disposal of the pollutant.
- ☒ **Public Health Protection**- an example is the medical examination of residents in a community to determine if anyone has experienced any health problems because of the violations at issue.
- ☐ **Environmental Restoration and Protection** –improving the condition of the land, air or water in the area damaged by the violation. For example, restoring a wetland or planting trees along a riparian zone to reduce erosion and provide shade for improved water quality.

- ❑ **Emergency Planning and Preparedness** – providing assistance to a responsible state or local emergency response or planning entity. Such assistance may include the purchase of computers and/or software, communication systems, chemical emission detection and inactivation equipment, HAZMAT equipment or training.
- ❑ **Assessments and Audits** to determine if the Respondent is causing any other pollution problems or can run its operation better to avoid future violations.
- ❑ **Environmental Compliance Promotion**- providing training or technical support to other members of the regulated community to achieve, or go beyond, compliance with applicable environmental requirements.
- ❑ **Other Projects** that have environmental merit but do not fit within the categories listed above.

Who is conducting the project? (i.e. Respondent or third party entity such as a watershed council or other nonprofit organization)

Oregon Health Authority

Location where project will take place:__

Lower Umatilla Basin Groundwater Management Area (LUBGWMA) in northern Morrow County and Umatilla County.

Project description (Please attach an extra sheet of paper, if necessary):

OHA will use the fund to pay for OHA staff support and for services from Local Public Health Authorities (LPHAs) and services and products from contracted private vendors to reduce exposures to elevated nitrates in domestic well water to people in the LUBGWMA, pursuant to the accompanying Oregon Department of Environmental Quality (DEQ)-approved Funding Agreement between OHA and the Respondent Port of Morrow.

Activities, as additionally described in the approved Funding Agreement, include one or more of the following: providing point-of-use water treatment systems and maintenance of those systems; proving potable water deliveries where treatment systems are ineffective or do not provide adequate quantities of water

for activities of daily living; domestic well water screening, testing and interpretation; outreach, education and health risk assessment to characterize and communicate to the public about the need to test for and treat elevated nitrates in domestic well water; and planning, coordination and communication required to carry out all of the above short-term public health interventions and develop medium- and long-term strategies to mitigate exposures to nitrates in domestic well water in the LUBGWMA.

What environmental benefits are expected?

Elimination of exposures to elevated nitrates through drinking and cooking water for people in the LUBGWMA who rely on domestic well water for daily needs of living.

How will you measure/assess the benefits?

Households have access to drinking water for drinking and cooking from a household tap that meets the Clean Water Act Maximum Contaminant Level for nitrate (10 milligrams/liter or less) as confirmed through a laboratory test, or by receiving potable water deliveries, or a combination of the two.

What is the total projected cost of the project? Explain. (Qualifying costs are all reasonable costs of executing the SEP and may include costs of preparing the SEP proposal, costs of materials and services, wages paid to employees (appropriate to the work), and wages and proportional overhead for employees of a third party executing the project. Qualifying costs do not include entertainment or refreshment costs related to the SEP.)

The total SEP contribution is \$1,933,721.

OHA costs will fall into the categories below; exact amounts will depend on comprehensive spending plans that reflect coordination among state general funds, federal grant funds, and any other sources of funds that become available over the project period to state and county agencies for domestic well public health interventions described in the scope of work.

- **OHA personnel** – cover in part staff time for Domestic Well Safety Program Coordinator, Healthy Waters Programs Coordinator Natural Resource Specialist, Public Health Toxicologist, Environmental Epidemiologist

- **OHA contractual expenses** – may include Morrow and Umatilla Counties, environmental testing laboratories, water treatment providers, delivered potable drinking water suppliers, translation and interpretation vendors, facilitation and technical consultants, and similar.
- **OHA indirect costs** – OHA's approved indirect costs rate is 5%

What is the timeframe for the project (most projects are completed within one year)? Include milestones and final completion date.

This project is a component of a many-decades program; households in the LUBGWMA that rely on domestic well water will require alternate drinking water sources until the groundwater clears of excess nitrate. OHA anticipates carrying out short- and some medium-term actions with financial support from the Fund between 2023-2027.

Date : 10/31/23

Signature 

This Funding Agreement ("Agreement") is made this 30th day of October, 2023 between the Oregon Health Authority ("OHA"), and the Port of Morrow ("Funder").

1. **Source of Funding and Recipient.** Funder hereby agrees to contribute \$1,933,721.00 to OHA to fund public health work related to nitrate-contaminated domestic well drinking water in the Lower Umatilla Basin Groundwater Management Area (LUBGWMA). The Port is entering into this Agreement for the purposes of fulfilling the conditions for penalty reduction established in Section I, Paragraph 24 of the Mutual Agreement and Order in Case No. WQ/I-ER-2021-106 through performance of a Supplemental Environmental Project ("SEP") approved by the Oregon Department of Environmental Quality ("DEQ"). OHA shall administer all funding contributed by Funder pursuant to the terms and conditions of this Agreement.
 - a. The first payment of \$966,860 shall be made no later than December 31, 2023.
 - b. The second payment of \$322,287 shall be made no later than September 30, 2024.
 - c. The third payment of \$322,287 shall be made no later than June 30, 2025.
 - d. The fourth and final payment of \$322,287 shall be made no later than June 30, 2026.

The payment deadlines above are deferred during the pendency of any dispute regarding an alleged misexpenditure of funds, as described in Sections 10 and 11 of this Agreement. The payment of all funds owing to date is due within 30 days following the resolution of the dispute.

2. **Use of Funding.** OHA will use funds provided by Funder to pay for OHA staff support and for services from Local Public Health Authorities (LPHAs) and to purchase products and services from contracted private vendors that meet one or more of the following purposes:
 - a) **Treatment and maintenance.** Direct domestic well users with elevated nitrate concentrations to alternative drinking water or drinking water treatment options, including but not limited to contracting with one or more local water treatment companies (e.g., currently Pure N Soft Water

Treatment, Hermiston) to install certified point-of-use treatment systems and to provide maintenance for those systems in households found to have nitrate levels in domestic well water exceeding 10 milligrams per liter.

b) Potable water provisioning. Cover costs to deliver potable water to households with nitrate levels in domestic well water that exceed the treatment capabilities of point-of-use (i.e., kitchen tap) water treatment systems (nitrate levels greater than 25 milligrams per liter), or to meet supplemental needs due to treatment systems not producing an adequate volume of drinking and cooking water for the number of people in the household.

c) Domestic well water screening, testing and interpretation.

- Hold community screening events for domestic well owners or users to bring samples of water for onsite evaluation to indicate whether follow up testing is needed.
- Support drinking water sample collection.
- Provide vouchers to domestic well owners or users covering testing for nitrate, arsenic, bacteria, lead, and hardness (which when present can impact the effectiveness of treatment systems) to be redeemed with OHA-contracted and accredited testing laboratories (currently Kuo Labs and Umpqua Research Company – Table Rock).
- Provide educational support to interpret test results and provide guidance to domestic well users.

d) Outreach, education and health risk assessment. Obtain translation/interpretation and graphic designer services and arrange with media outlets to produce or disseminate culturally and linguistically accessible materials. Specific activities may include:

- Compiling information related to water testing, treatment and health risks from nitrate exposure.
- Paying for preparation of outreach materials, such as graphic design services, printing, and radio/video public service announcements services for dissemination online and via media channels.
- Paying professional vendors with OHA price agreements for translation and interpretation services as needed.

e) **Planning and coordination.** Contract with facilitation and/or technical consultants to convene key parties, collect and analyze relevant information, and support development of plans of actions to address short, medium and long-term potable water needs of LUBGWMA residents currently dependent on nitrate-contaminated domestic wells for drinking and cooking water, and to support coordinated communication to the public about those plans and their implementation. Actions to be addressed in plans include, but are not limited to:

- Identification of options and strategies to extend existing public water system service areas, establish new public water systems, and dig new individual wells.
- Ongoing provision of treatment systems, maintenance of those systems, and provision of potable water where other interventions are not sufficient or feasible.
- Ongoing communication to the public to raise awareness of the need to test domestic well water, options to address elevated nitrates, roles and responsibilities of state and local government agencies, and implementation status of mitigation measures.

3. Distributions of Funding.

- a. **Minimum distribution for treatment and provisioning of potable water.** OHA shall distribute at least 50% of the funds provided by Funder to pay for services that address treatment and maintenance, potable water provisioning and testing according to Sections 2.a) and 2.b), and 2.c), respectively, of this Agreement. OHA shall make distributions from the funds based on contracts for services entered into between OHA and LPHAs, and/or between OHA and vendors providing the services noted in Section 2 of this Agreement.
- b. **Coordination with funding from other state and federal sources.** OHA shall consider existing and anticipated state funding available to OHA and anticipated federal funding available to Morrow County and Umatilla County in prioritizing use of funds provided by Funder to support the services noted in Section 2 of this Agreement with the goal of reducing the number of people exposed to elevated nitrates in domestic well drinking water as rapidly as possible.

4. Administration.

- a. OHA shall administer funding in accordance with the terms of this Agreement, under and subject to Oregon Revised Statutes (ORS) 413.033(5) and ORS 190.110(1), and in accordance with procedures for the administration of similar funds administered by OHA, including charges for OHA administrative and program delivery costs at 5%. Subject to the limitations and conditions of this Agreement, OHA has operational discretion over the funds.
- b. No distribution of the funds shall be made to individuals in the form of payments directly to an individual.

5. Reporting

- a. OHA will submit expenditure reports to Funder no later than:
 - i. June 30, 2024.
 - ii. March 30, 2025.
 - iii. March 30, 2026.
 - iv. July 31, 2027 (Final expenditure report with total amounts received and total expenditures for the Agreement period.)
- b. Funder shall provide such reports to DEQ for review. Unless Funder objects to an expenditure described in the report within 90 days of receipt of the report, Funder may not submit a notice described in Section 10 of this Agreement and is not entitled to a return of misexpended funds for the reporting period.

6. Spend Down of Fund.

OHA will endeavor to spend down the funds by June 30, 2027, with the option to extend that date if approved by Funder and DEQ.

7. Amendment.

The parties or authorized representatives may amend this Agreement by mutual written consent.

8. Controlling Law.

This Agreement shall be governed by the laws of the State of Oregon.

9. Return of Funds

Any funds not spent by OHA by June 30, 2027, or upon termination, will be returned to Funder, unless an extension is approved according to Section 6 of this Agreement.

10. Misexpended Funds

OHA may only use the funds from Funder in accordance with this Agreement. If, within the time period described in Section 5. b. of this Agreement, Funder believes that funds have not been used in accordance with this Agreement, and thus have been misexpended, Funder shall provide notice to OHA that includes but is not limited to: (1) the amount of funds believed to have been misexpended; and (2) an explanation of why Funder believes the funds have been misexpended. OHA has 30 calendar days to respond to the notice, disputing the allegations or describing how the misexpenditure will be cured. If OHA and Funder cannot resolve the issue of the alleged misexpenditure, the parties may agree to engage in dispute resolution in accordance with Section 11 of this Agreement. If DEQ provides a determination in writing to OHA and Funder that funds were expended in accordance with the approved SEP, the funds shall be deemed to have been used in accordance with this Agreement.

11. Dispute Resolution

The parties shall attempt in good faith to resolve any dispute arising out of or related to this Agreement. In addition, the parties may agree to utilize a jointly selected mediator or arbitrator (for non-binding arbitration) to resolve the dispute short of litigation. If the parties are unable to resolve their dispute, either party may pursue any legal remedy available to the party.

12. Termination

Either party may terminate this agreement with 90 days prior written notice to the other party.

13. Notice

Any reporting or notices submitted under this Agreement must be sent to the following, by email and mail:

Oregon Health Authority

Attn: André Ourso, Administrator
Center for Health for Protection, Public Health Division
800 NE Oregon St. Ste 640
Portland, OR 97232-2187
971-673-0404
andre.ourso@oha.oregon.gov

Port of Morrow

Lisa Mittelsdorf
Executive Director
Port of Morrow
PO Box 200
Boardman, OR 97818
541-481-7678
lisam@portofmorrow.com

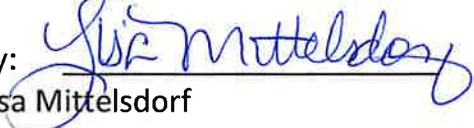
IN WITNESS WHEREOF, the Oregon Health Authority and the Port of Morrow have executed this Agreement.

OREGON HEALTH AUTHORITY

By: 
Cara Biddlecom
Interim Public Health Director of the Oregon Health
Authority

DATED: October 30, 2023.

PORT OF MORROW

By: 

Lisa Mittelsdorf

Executive Director

DATED: Oct. 31, 2023.

Port of Morrow Land Application Program

Interim Non-Growing Season Compliance Plan

October 2023



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Appendix A - Land Application – Irrigation Circle Risk Ranking Winter Irrigation Compliance
Plan (May 5, 2023; updated October 25, 2023)

1 Introduction and Plan Objectives

This Compliance Plan is attached and incorporated into Mutual Agreement and Final Order, No. WQ/I-ER-2021-106 (the MAO). According to the MAO a violation of this Compliance Plan is a violation of the MAO.

The Port of Morrow (Port) operates an industrial wastewater land application program on the farmlands in the vicinity of the Port's Boardman Industrial Park (Figure 1) under an Oregon Department of Environmental Quality (DEQ) water pollution control facilities (WPCF) land application permit (Permit No. 102325) effective December 21, 2017, and as modified (Modification #1) effective November 2, 2022 (Permit).

Schedule A(14)(B) of the Permit provides, "No later than November 1, 2026, all wastewater must be stored in lined lagoons for the non-growing season [November through February] unless authorized for beneficial use and treated not to exceed the [Permit] Table A1 limits at the time of land application." To achieve this requirement, Permit Schedule C includes schedules for the Port to construct additional wastewater storage and treatment facilities, including anaerobic digesters by November 1, 2023 (Schedule C(3)); secondary treatment by November 1, 2025 (Schedule C(4)); and additional wastewater storage by November 1, 2026 (Schedule C(5)).

Until the non-growing season storage and treatment requirements can be achieved, the Permit includes interim limits on the land application of wastewater during the non-growing season. These interim limits "apply until November 1, 2026 when non-growing season wastewater will be stored except as approved by DEQ for beneficial uses with treated effluent." Permit Schedule A(13)(A)(vi). The interim non-growing season limits in Schedule A(13)(A) include, among others:

- (ii) Application sites where the sum of soil nitrate, in the 4th and 5th foot, is greater than or equal to 30 lbs/ac are prohibited from receiving non-growing season irrigation,
- (iii) Application sites with soil moisture in the 4th foot of the soil profile equal to or greater than 75% of the 4th foot water-holding capacity are prohibited from receiving additional non-growing season irrigation.
- (iv) Non-growing season irrigation is to be limited to utilization of the available water-holding capacity in the top three (3) feet of the soil column, only.

In addition, Permit Schedule A(11) prohibits, at all times other than a prescribed leaching event pre-approved by DEQ, "moisture . . . at or above the water holding capacity for the field past the 5th foot of the soil column caused by irrigation, unless the [Port] . . . demonstrates that the excess moisture was due to reasons beyond its reasonable control such as excessive precipitation."

Until the required wastewater storage and treatment measures have been completed, the Port may not be able to comply during the non-growing season with the interim non-growing season land application limits, as well as the Permit prohibition on leaching. DEQ expects the Port to take necessary steps to comply with all permit conditions. The objectives of this Interim Non-

Growing Season Compliance Plan are to minimize, to the greatest extent practicable, noncompliance with the interim limits and leaching prohibition and any adverse effects on downgradient groundwater users and groundwater nitrate concentrations from any noncompliance that does occur as the Port completes the Schedule C permit requirements.

The plan also requires the Port to inventory and evaluate system infrastructure to prevent unauthorized wastewater discharges during both the growing and non-growing seasons.

2 Land Application Expansion Area Actions

The Port has obtained 1,250 acres at Farm 4 for the land application program. Of these acres, approximately 366 are already within the DEQ-authorized land application boundary, and approximately 884 acres will be new acres. The Port has submitted the appropriate datasets and forms to DEQ to obtain its approval of the new acres that are not already within the DEQ-authorized land application boundary. Figure 2 shows these new acres, the existing land application boundary, and the proposed boundary expansion. These new land application areas are all within the LUBGWMA boundary and straddle the Morrow and Umatilla County line. The Port is also considering addition of additional acreage not yet in the land application program, which will be subject to the same process with DEQ as a modification to the permit and OM&M plan. In addition, prior to any application of wastewater to application sites approved after the effective date of Mutual Agreement and Order No. WQ/I-ER-2021-106, each such site will be ranked in accordance with Paragraph 3.1.1 below and added to the list of sites in Appendix A.

3 Non-Growing Season Permit Noncompliance and Groundwater Risk Minimization Plan

3.1 Risk Reduction to Downgradient Users Program

To minimize potential impacts to downgradient groundwater users and the risk of increasing groundwater nitrate concentrations from noncompliance with the Permit's non-growing season restrictions, the Port has evaluated and ranked the Port's land application areas with respect to these risks. Areas with the lowest risk are prioritized for non-growing season use if there is insufficient acreage that meets the Permit's non-growing season land application criteria. The Port has developed and implemented this risk reduction program for the 2022-2023 non-growing season and, with the approval of DEQ in writing, will implement any appropriate program revisions or refinements based on new information regarding the factors used to rank fields during future non-growing seasons.

3.1.1 Ranking Irrigation Circles and Zones

The Port has reviewed several factors associated with each field within the land application program and has compiled the information together in a score used to rank fields (or areas of farms) based on risk. The Port has reviewed and scored the following parameters that together have been used to identify areas of farms that minimize the risk of nitrate movement to or in the

shallow groundwater system if noncompliance occurs, as well as lower the risk to downgradient water users:

- a. Inventory of Domestic Water Supply Wells Downgradient from the Land Application Program. The Port has identified downgradient alluvial groundwater supply wells that are being used for domestic purposes and the distance to these wells from the Port's land application boundary. This information has been used to score and rank risk.
- b. Review Current Land Application Program Downgradient Groundwater Monitoring Well Datasets. The Port monitors the alluvial groundwater quality at the upgradient and downgradient boundary of its land application program. This data has been reviewed to assess the condition and trend of the water quality across the downgradient boundary of an area to assess how the system is responding to current and past land application practices.
- c. Soil Water Holding Capacity and Depth to Groundwater. The hydraulic properties of the soils at a site and the depth to the groundwater table have been evaluated and used to rank fields within the land application boundaries.

This risk reduction to downgradient users' evaluation has been summarized in a technical memorandum submitted to DEQ and attached as Appendix A.

3.1.2 Application of Non-Growing Season Wastewater

Schedule A(13)(A)(i) of the WPCF permit requires the Port to rank sites according to nitrogen and moisture in the soil profile. Appendix A includes additional information for the Port's program which summarizes areas that have been identified as low, moderate, and high risk to downgradient users. The areas with the lowest risk ranking have been prioritized for winter irrigation use when there is insufficient acreage that meets the Permit's interim non-growing season requirements. The Port will not apply wastewater to an area of high risk during the non-growing season that does not meet the Permit's interim non-growing season requirements.

The Port will first seek to utilize sites of low risk and apply within the terms of the non-growing season limitations of the permit. Then, or concurrently, the Port may apply to moderate risk fields within the non-growing season limitations of the permit. Wastewater will only be applied during the non-growing season to an area of moderate risk that does not meet the Permit's interim non-growing season requirements if all areas of low risk have been utilized first with site management practices to minimize leaching losses past the 5th foot during periods of violations. The Port must document the justification for applying wastewater to the area of moderate risk and must evaluate soil moisture storage capacity to minimize leaching losses past the 5th foot of the soil profile. Facility monitoring reports during any period(s) of non-compliance with the Permit's interim non-growing season requirements will be provided to DEQ each month along with statement of compliance or non-compliance with this plan.

3.2 Crop Planning & Management Program

The Port is working with the farmers participating in the land application program to evaluate crop plans with the goal of obtaining the appropriate selection of crops for individual fields and across the farms that will best assist the Port in the successful operation of the land application program. This program is an interim measure to assist the Port while the appropriate infrastructure is built to store winter wastewater by no later than November 1, 2026.

The Port will coordinate with the farmers throughout the year to assist the Port in complying with the Permit's interim non-growing season requirements to protect groundwater while also incorporating the farmer's goals where possible. The Port and farmer will use the up-to-date field nitrate and moisture data to plan out the future crops to identify the acreage planted in deep-rooted (4- or 5-foot) and high-nitrogen uptake crops that is needed to minimize noncompliance with the Permit's interim non-growing season requirements. The goal of the program is to have at least 90% of the circles planting deep rooted (4-or 5-foot) and high-nitrogen uptake crops with a strong focus on crop uptake of soil nitrogen during the growing season. Increasing the acreage of these crops in the growing and non-growing season will reduce nitrate-nitrogen concentrations in the 4th and 5th foot prior to and during the non-growing season and allow for accessing the full 5-foot soil profile for nitrate-nitrogen storage, providing both more fields that meet the Permit's interim non-growing season requirements and more storage capacity within each of these fields for non-growing season application that meets the Permit's requirements.

Transition into this new program will occur by November 1, 2024. Failing to achieve the 90% goal by November 1, 2024, is not a violation of this Compliance Plan. If the goal is not achieved, the Port will provide a written explanation to DEQ with the Facility Annual Report for 2024 (due April 15, 2025) regarding the extent to which the goal was achieved and any effect on compliance with the Permit's interim non-growing season requirements.

3.3 Non-Growing Season Adaptive Management Program

A significant quantity of water content data from individual fields is collected by the Port, including soil moisture data collected bi-weekly during the non-growing season and weekly during the growing season. Required soil sampling data is collected after harvest is complete. In addition to these datasets, irrigation water deliveries, precipitation, and crop evapotranspiration data are continually compiled for each field. The Port will use these datasets to model field nitrate and water loading capacities as the non-growing season begins and provide a forward forecast for the Port's non-growing season watering that will maximize the allowed application of wastewater within the Permit's interim non-growing season requirements.

Additionally, the Port will develop a soil sampling program to be implemented in the non-growing season to assess, on a monthly basis, the 4th and 5th foot soil nitrate conditions at a select set of representative fields at each of the Farms receiving non-growing season irrigation. This additional dataset will be evaluated during and at the end of each non-growing season to assess the performance of the crop and irrigation plan.

The forward forecasting of nitrate and water loading capacities, monitoring of soil water content, and monthly assessment of non-growing season soil nitrate in the representative fields will be

used by the Port to inform, adjust, and learn from the previous non-growing season land application program and modify the next year's non-growing season program accordingly. This will include adapting the annual crop management plan (Section 4.2), the next non-growing season land application plan, and risk reduction program based on the new data. The first report will be prepared and provided to DEQ by November 1, 2023, and annually by November 1 thereafter during the term of this plan.

3.3.1 Modeling Program

The initial step in creating the forecasting model (to be completed prior to each non-growing season) is developing a more versatile database to house the data and allow access to the data by the Port and its contractors. The Port will build the new database, transition the data from the existing database to the new database, and be ready by November 1, 2023, to use it in the forecasting modeling for the 2023-24 non-growing season. Once the improved database is developed, the Port will have the capability to more readily track the following:

- Pre- and post-harvest measured soil nitrate and NH₄-N (0 to 5 feet)
- Field total nitrogen (TKN plus nitrate/nitrite-nitrogen) loading
- Water loading (0 to 5 feet)
- Precipitation
- Crop evapotranspiration
- Applied irrigation from all sources (supplemental, wastewater effluent)
- Pond(s) storage capacity

Tracking this data will allow for improved, adaptive land application management during the non-growing season. The database will inform the forecasting model and processes represented in the model shown in Figure 3. The model will then be applied to evaluate options for the upcoming non-growing season and allow the Port more flexible and efficient management during the non-growing season. The model analysis will also assist the Port in implementing and updating infrastructure needs to best fit the necessary interim non-growing season land application program.

3.3.2 End of Non-Growing Season 4th- and 5th-Foot Evaluation of Representative Fields

Using the information developed in the Risk Reduction to Downgradient Users Program (Section 3.1) and the Port's historic understanding of operations at each land application site, up to 5 individual fields will be selected as representative fields that will be used in a detailed evaluation of the 4th- and 5th-foot soil water content and nitrate. The goal of field selection is to represent the predominant physical conditions that exist at each land application farm. Bi-weekly water content is currently being measured at all active winter irrigation fields. This evaluation will utilize that water content data in addition to establishing a monthly soil sampling program to analyze NH₄-N (0 to 5 feet) and nitrate (0 to 5 feet). The data will be analyzed in conjunction with non-growing season land application and precipitation data to assess nitrate and water loading in the 4th and 5th foot. This, in turn, will be used by the Port to inform, adjust, and learn

from the previous non-growing season program and modify the next year's non-growing season program accordingly.

3.4 Weather Impacts on Interim Measures

The weather conditions at the land application sites (Farms 1, 2, and 3 and Farm 4/Farm 5), both during the growing season and during the non-growing season, can dramatically impact the Port's annual non-growing season land application plan. For example, a wetter than average spring, summer, or early fall can impact the available pond water storage capacity at the start of the non-growing season. Or an extended freezing event that prevents land application can require surge storage capacity during the event and then recovery and planning for the next event. These unpredictable and uncontrollable weather conditions can dramatically affect the Port's non-growing season land application plans and require the Port to adapt as necessary. Furthermore, weather conditions can be highly variable between farms, and for this reason the Port will be installing weather monitoring stations located at representative farm locations and collecting weather data from these stations to document weather conditions throughout the year.

The weather stations will be constructed and registered with the National Oceanic and Atmospheric Administration (or another recognized weather tracking system) by December 1, 2023.

4 New Source Additions and Non-Growing Season Limitations

The Port will not seek DEQ approval for new influent sources that will increase influent flow to be managed for land application above the limits specified in this section until the Port attains compliance with all provisions of the Permit or until the Port adds non-growing season storage capacity to store the increased flow as described in this section.

Based on industrial potable water usage supplied to each industrial source, the Port reported influent flow of 1,243,999,211 gallons for the non-growing season reporting period of November 2021 through February 2022. This amount, however, overestimates the industrial wastewater flows received by the Port for land application because of industrial consumptive water uses and other losses. Except for four data centers, all industrial wastewater received by the Port for land application flows through, and is metered at, the South Lift Station or the North Lift Station. The exceptions are: PDX 62, whose discharge flows are separately metered; PDX 90, some of whose discharges flow directly to Farm 2 and are separately metered; and VA Data 1 and PDX 109, whose discharge flows are not metered. For VA Data 1 and PDX 109, discharge flows will be conservatively estimated using their potable water usage. Based on the total industrial discharge flows measured at the North Lift Station, South Lift Station, PDX 62, and PDX 90, and using the potable water usage at VA Data 1 and PDX 109 to estimate their discharge flows, the reported discharge flow for the most recent full non-growing season reporting period of November 2021 through February 2022 was 1,031,844,698 gallons. The Port has identified ongoing influent flow reductions at specific industries (Calbee and Lamb Weston Boardman) of 54 million gallons (MG) and 9 MG (estimated at 3MG if averaged over the non-growing season) that will be implemented by the next winter season period beginning November 1, 2023.

Subtracting the 57 MG in identified non-growing season reductions gives a baseline total gallon amount to establish a non-growing season total gallon influent limit to aid in ongoing improved compliance.

The Port will meet the following wastewater influent limit during the term of this Compliance Plan, resulting in no net increase of influent during the non-growing season until Permit compliance is attained. The Port may request DEQ approval to increase the non-growing season and annual influent volume limits equal to the projected flow from Cal Farms only if the Port demonstrates that it has increased storage capacity by an amount of at least three times the projected annual flow from Cal Farms by new storage infrastructure addition. No other new sources other than those listed in the Permit, Schedule A(1) will be approved until the Port attains compliance with the Permit's land application requirements. The limit below takes effect beginning November 1, 2023, in advance of the next non-growing season period.

Non-Growing Season Period	Wastewater Non-Growing Season Influent Limit
November 1 – End of February (each year)	974,844,698 gallons

In addition, the Port will meet the following annual wastewater influent limit during the term of this Compliance Plan, resulting in no net annual increase of influent until compliance with the Permit's land application requirements is attained, with the exception of the potential addition of Cal Farms as discussed above. Based on the measured influent flows described in the preceding paragraphs, the Port reported a total influent volume of 3,039,667,707 gallons during the period of November 2021 – October 2022.

Total net influent flow from all influent sources is limited as follows, taking into account the flow reductions identified above (54MG and 9MG). This limit takes effect November 1, 2023.

Reporting Period	Total Influent Flow Limit
November 1 – October 31 (each year)	2,976,667,707 gallons

During the term of this compliance plan, the Port will provide a summary of compliance with the influent flow limits described above as part of the annual report due April 15th each year as required by the permit. The summary will include a table of actual measured influent flows compared to the influent flow limits of this section.

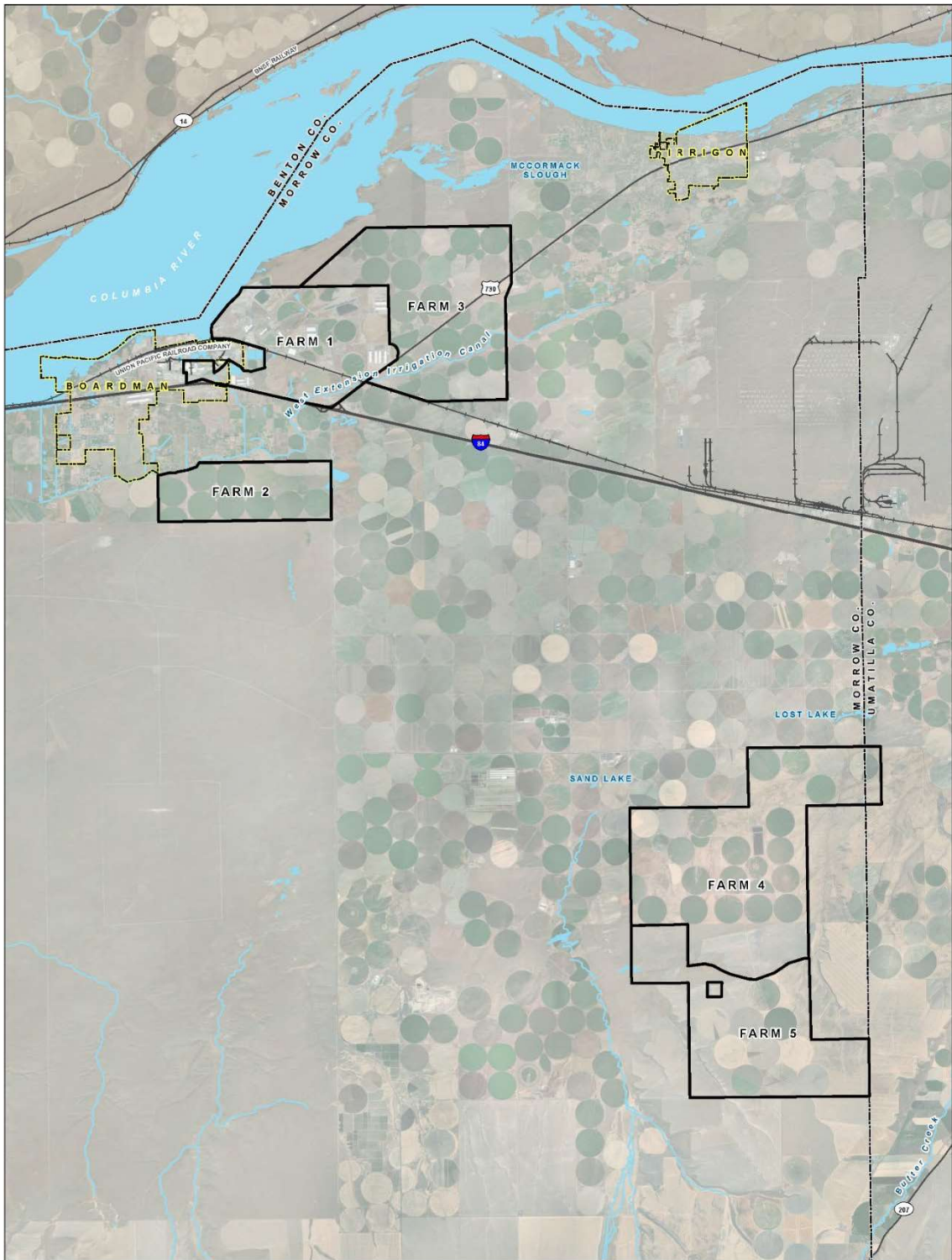
5 Infrastructure Inventory and Repair Program

The Port has reported several occurrences of wastewater line leaks in 2023. As required by Schedule B(3) of the Permit, the Port is required to perform daily visual inspections of its wastewater infrastructure (including lift station, storage systems, and pipelines) to evaluate malfunctions or potential for environmental release. Through these inspections, POM identifies

equipment and infrastructure that will likely require repair or replacement. The Port will develop a tracking program and schedule to inventory and evaluate critical infrastructure for repairs and/or replacement. This will be completed and confirmation of the inventory and scheduling program provided to DEQ no later than April 15th, 2024.

6 Limitations

Both the availability of equipment, parts and subsequent shipping issues have caused increasing delays in all projects across the Port over the past several years. It should be noted all dates provided in this document assume near-normal to normal shipping times. Should there be a significant delay, this could directly affect those dates. The Port will notify DEQ about any delay and request a new date of completion for the corresponding project. DEQ will evaluate any submitted requests.



LEGEND

Port's Existing Land Application Boundary

All Other Features

County Boundary

City Boundary

Railroad

Major Road

Watercourse

Waterbody

Date: May 5, 2023
Data Sources: BLM, ESRI, CDOT, USGS, Maxar Imagery (2019)

Document Path: Y:\0231_PortofMorrow\Source_Figures\025_Ongoing_Hydro_2022\Winter_In_Compliance_Plan\Figure1_Port_Land_App_Boundaries_Fall2022.mxd; npamer

FIGURE 1

Port Land Application Boundaries – Fall 2022

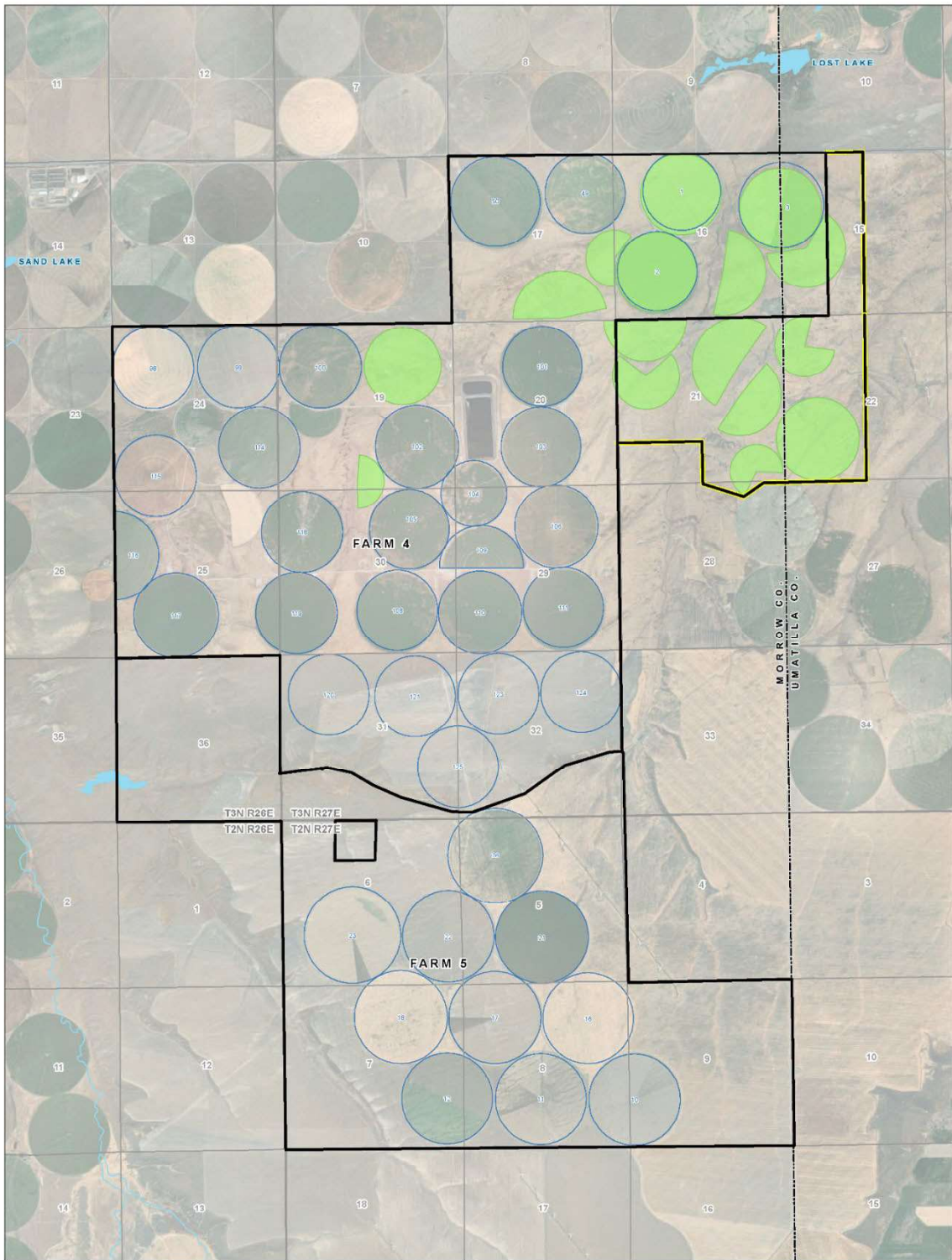
Interim Non-Growing Season Compliance Plan

Port of Morrow



0 1 2 3
Miles





LEGEND

- Proposed Land Application Boundary Line Expansion
- Existing Land Application Irrigation Circle
- New Irrigation Circle
- Port's Existing Land Application Boundary
- All Other Features**
- County Boundary
- ~ Watercourse
- Waterbody

Date: May 8, 2023
Data Sources: BLM, ESRI, ODOT, USGS, Maxar Imagery (2018)

Document Path: Y:\0281_PortofMorrow\Source_Figures\025_Ongoing_Hydro_2022\Winter_Irr_Compliance_Plan\Figure2_Port_Land_App_Madison_Expansion_2023.mxd, npalmer

FIGURE 2

Port Land Application Farm 4 2023 Expansion Acres

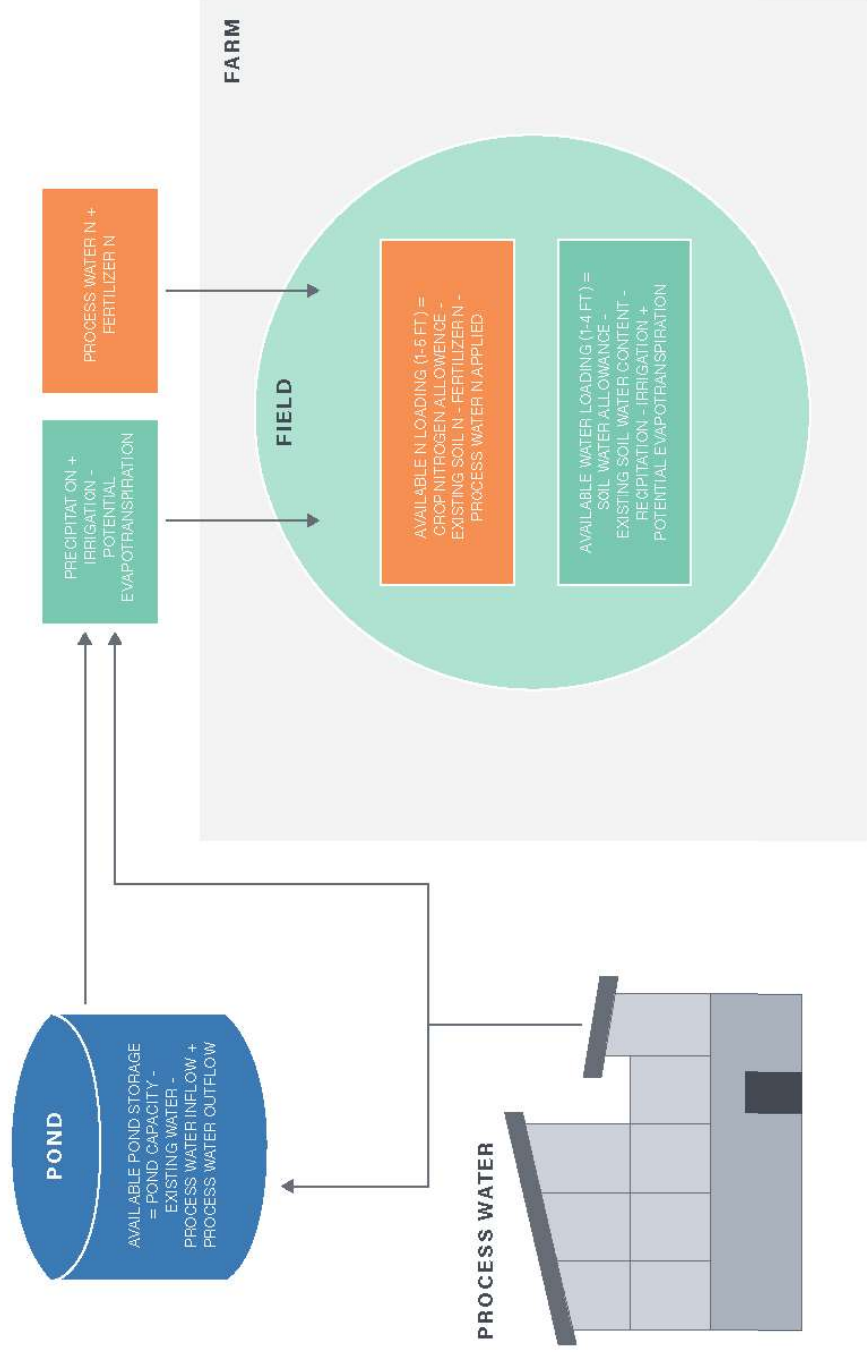
Interim Non-Growing Season Compliance Plan
Port of Morrow



0 1/2 1
Miles



FIGURE 3
Forecast Modeling Schematic
 Interim Non-Growing Season
 Compliance Plan
 Port of Morrow



Appendix A

Land Application

Irrigation Circle Risk Ranking Winter Irrigation Compliance Plan

May 5, 2023

and

October 25, 2023 Update



TECHNICAL MEMORANDUM

Land Application - Irrigation Circle Risk Ranking Winter Irrigation Compliance Plan

To: Miff Devin, Port of Morrow

From: Bruce Brody-Heine, GSI Water Solutions, Inc..

Date: May 5, 2023

1. Introduction

The Port of Morrow (Port) operates an industrial wastewater land application program on the farmlands in the vicinity of the Port's Boardman Industrial Park. The program operates under an Oregon Department of Environmental Quality (DEQ) water pollution control facilities (WPCF) land application permit, as modified on November 2, 2022 (Permit No. 102325 Modification 1) (Permit).

The modified Permit retains restrictions on the application of wastewater during the designated non-growing (winter) season of November through February, including prohibiting applying wastewater to sites where (1) the sum of soil nitrate in the 4th and 5th foot is greater than or equal to 30 pounds per acre or (2) soil moisture in the 4th foot of the soil profile is equal to or greater than 75% of the 4th foot water-holding capacity. Since these restrictions were first applied in December 2017, there has been insufficient acreage in the Port's land application program that meets these criteria to apply all the wastewater that the Port receives during the winter, particularly during a wet winter. In addition, the recent Permit modification will effectively require the Port to eliminate all land application during the winter, beginning on November 1, 2025. The Permit modification includes a schedule of required wastewater treatment, storage, and other measures to achieve this restriction.

While these infrastructure projects are under construction, the Port's Winter Irrigation Compliance Plan (September 2022) includes proposed interim measures to minimize potential risks to the groundwater system and downgradient groundwater users from the application of wastewater during the non-growing season to sites that do not meet the Permit's non-growing season soil nitrate and moisture criteria.

One interim measure is the evaluation and ranking of the Port's land application fields with respect to groundwater risks to identify areas that can be prioritized for winter irrigation if there is insufficient acreage that meets the Permit's winter irrigation criteria. The goal of this interim measure is directing wastewater, when needed, to fields with the lowest risk of impacting both shallow groundwater and downgradient groundwater users (i.e., alluvial domestic drinking water wells).

2. Approach

The Port evaluated multiple parameters associated with each field within the land application program. The Port used the following parameters to define risk that will minimize the risk of nitrate movement to the shallow groundwater system if wastewater must be applied to fields that do not meet the Permit's winter irrigation soil

nitrate and moisture criteria, as well as lower the risk to downgradient water users via the shallow groundwater system:

1. Inventory of Domestic Water Supply Wells Downgradient from the Land Application Program. The Port has identified downgradient alluvial groundwater supply wells that are being used for domestic purposes and the distance to these wells from the center of each field within the Port's land application farms.
2. Depth to Groundwater. The depth to the groundwater table was evaluated at the center of each pivot and used to rank fields within the land application boundaries.
3. Soil Water Holding Capacity. The hydraulic properties of the soils at each field were evaluated and used to rank fields within the land application boundaries.
4. Review Current Land Application Program Downgradient Groundwater Monitoring Well Datasets. The Port monitors the alluvial groundwater quality at the upgradient and downgradient boundary of its land application program. This data was reviewed to assess the condition and trend of the water quality (nitrate concentrations) across the downgradient boundary of an area to assess how the system is responding to current/past land application practices.
5. Alluvial Aquifer Currently Impacted or Not Impacted. The current status of the alluvial aquifer and if it currently is impacted or if it is un-impacted was also evaluated for each field.

The Port evaluated specific fields and zones within each land application farm using the factors listed above to rank and identify fields/zones within each farm that minimize risks in a responsible manner if the Port expects to need to apply wastewater to fields that do not meet the Permit's winter irrigation soil nitrate and moisture criteria. The score for each parameter was compiled together into a score to rank each field based on risk. Table 1 presents the results of the scores and ranking for each field.

3. Field Ranking Evaluation

An evaluation was completed for each of the five parameters and a risk level was assigned based on the datasets. Table 1 presents the summary of each parameter's evaluation and the associated risk score from 1 (low risk) to 5 (high risk). The assigned risk scoring ranges for each parameter are presented on the top of Table 1 and in Table 2 and as described below.

3.1 Domestic Well Locations

Search Area

The Port performed a water well search to identify water wells downgradient of the land application operations. The downgradient areas were based on the known groundwater flow direction at each land application Farm. After consulting with the DEQ hydrogeologist, the Port completed a water well search in each downgradient search area (Figure 1a). Water wells located in these downgradient search areas were identified using the following datasets:

- Lower Umatilla Basin Groundwater Management Area field located wells,
- OWRD water well database
- Other projects' field located wells in the region
- Visual aerial photograph search/inspection of the downgradient search areas for houses or offices; if no well was identified near the structure, an alluvial domestic well was assigned to the house or office.

The identification of the houses from the aerial photograph search are summarized in the figures in Attachment 1¹ and the wells are listed as “alluvial domestic, assumed” on the figures.

After identifying the wells in the search areas, the wells were categorized based on the unit they were completed in (alluvial, basalt or unknown); and based on the type of use for the well (domestic, irrigation, monitoring or other types of uses). Figure 1a presents the locations of all the water wells identified within the search areas, and Figure 1b shows only the domestic or unknown use type wells within the search areas.

Alluvial System

The Port’s field ranking is focused on downgradient domestic water wells completed in the shallow alluvial aquifer system because potential impacts from the land application program would be to this first water bearing unit. Therefore, the distance to domestic wells for each field ranking associated with nearby domestic wells was based on the distance to the downgradient well within the groundwater flowpath and only included domestic wells completed in the alluvial aquifer. In addition, all the well logs with an unknown well use and that are completed in the alluvial aquifer were also assumed to be “alluvial domestic wells” for the purposes of this evaluation.

Results

Farms 1, 2, and 3. Figure 2a shows all of the domestic wells (alluvial, basalt and unknown) located downgradient of the land application areas at Farms 1, 2, and 3. Please note that the Port’s 3 municipal East Beach wells completed in the alluvial aquifer were not considered in this evaluation because the Port operates these wells and continually manages the final nitrate water quality (through a blending process with City of Boardman water) to always be below the drinking water nitrate standard. Figure 2b presents only the alluvial domestic wells in the downgradient search areas along with the alluvial system’s groundwater contours and associated shallow groundwater flow directions. The groundwater contours and flow directions are from the Port’s monitoring well network at each Farm and reported each year to DEQ in their annual reports.

From this information the distance from the center of each pivot was calculated to the nearest domestic alluvial (or unknown) water well. The results are summarized in Table 1. There were no alluvial domestic water wells downgradient of Farms 1 and 3 prior to encountering the Columbia River², while numerous domestic wells are found downgradient of Farm 2.

Farms 4 and 5. Figure 3a shows all of the domestic wells (alluvial, basalt and unknown) located downgradient of the land application areas at Farms 4 and 5. In addition, the assumed alluvial domestic wells associated with housing or office structures identified are also shown on this figure. Figure 3b presents only the alluvial and assumed domestic wells within the downgradient search areas along with the alluvial system’s groundwater contours and associated shallow groundwater flow directions. The groundwater contours and flow directions are from the Port’s monitoring well network at each Farm and reported each year to DEQ in their annual reports.

From this information the distance from the center of each pivot within Farms 4 and 5 was calculated to the nearest domestic alluvial (or unknown) water well. These results are summarized in Table 1. To be conservative, Farm fields 1, 2, 3, and 4 were assumed to flow towards House #2 (Figure 3b), despite the groundwater flow direction not fully supporting this result. Based on the groundwater flow path, the distance to the nearest domestic well for farm fields (Farm 4) 98, 115, 116, and 117 and (Farm 5) 12, 18, and 23 was

¹ No houses were identified downgradient of Farm 3. Because so many domestic wells are downgradient of Farm 2, this area was not searched. Multiple structures were identified that look like housing in the area downgradient of Port’s Farm 4 and 5. These structures and the nearby wells are documented in Attachment 1.

² There is one alluvial well located downgradient of Farm 3. However, there are no wells or development allowed within the Umatilla National Wildlife Refuge and no visible structures that may require a domestic well, so this well is assumed to be mislocated by the driller on the well log.

assumed to be House #1 (Figure 3b). For all other irrigation circles at Farms 4 and 5, the distance to the downgradient domestic well UMAT 6099 was calculated.

The assigned risk score for this distance to domestic well parameter ranged from a land application field being within 0 to 2 miles was considered a high risk (given a score of 5), and fields being more than 5 miles away from the nearest domestic well as being a low risk (given a score of 1).

3.2 Depth to Groundwater from Field Surface

The second parameter evaluated is the depth of groundwater below the land surface at each field. This parameter is helpful to evaluate because the deeper the groundwater table, the longer it might take for water to move through the unsaturated zone. Possible impacts from the land application program will be reduced if the depth to the shallow alluvial groundwater is hundreds of feet below the field surface. Figure 4a and 4b present the depth of the center of each pivot to the top of the alluvial groundwater table at Farms 1, 2, and 3 and Farms 4 and 5, respectively.

The depths to groundwater table assigns a risk score between 1 and 5 to each field, with 0 to 15 feet to the alluvial aquifer considered a high risk (given a score of 5), and fields with greater than 60 feet to the alluvial aquifer as being a low risk and given a score of 1.

3.3 Soil Water Holding Capacity

The soil water holding capacity is the amount of water that a given soil can hold for crop use, or in different terms, the quantity of water that can be stored in the root zone and thus will not percolate to the water table. The Port, with the help of IRZ Consulting, has developed soil water holding capacity values for the land application circles based on field soil sampling and water content measurements completed at each field. The soil water holding capacity listed for each field in Table 1 and displayed in Figure 5 is the average over the top 5 feet for each field.

Fields with a higher soil water holding capacity are considered a lower risk than fields with lower soil water holding capacity. The average soil water holding capacity assigns a risk score between 1 and 5 to each field, with less than or equal to 1.25 inches water / foot soil considered a high risk (given a score of 5), and fields with greater than 2.25 inches water / foot soil being a low risk and given a score of 1.

3.4 Results of Port's Downgradient Monitoring Program Trends

The Port monitors the water quality at the upgradient and downgradient boundaries of each of the land application Farms. The data from this monitoring program provides an assessment of the Port's land application program and identifies whether there are obvious impacts to the shallow groundwater from land application. However, interpretation of the data is complicated by the fact that elevated nitrate (and other constituents) is present in the groundwater system upgradient of the Port's operations and is therefore already present in the shallow groundwater aquifer before it flows under the land application program circles.

Two components of the water quality data were evaluated as part of this field ranking exercise: 1) is the downgradient water quality greater or less than the upgradient (or background) groundwater quality, and 2) is the current nitrate trend (over the last several years) in the downgradient monitoring wells decreasing, increasing, or flat.

Each field was assigned a downgradient well based on the groundwater flow direction data and then these two water quality data parameters were evaluated and given a risk score. The information is presented in Tables 1 and 2.

3.5 Aquifer Contamination History

The final parameter used in this field ranking exercise is whether the aquifer beneath a field was already contaminated above the drinking water quality standard for nitrate. DEQ staff have expressed concerns about potentially impacting an area of the aquifer that currently does not exceed the nitrate water quality standard. To evaluate this parameter the water quality data for both the upgradient and downgradient monitoring wells associated with a field were reviewed for each field. If the appropriate upgradient monitoring well exceeded the drinking water standard of 10 milligrams per liter (mg/L), the risk of impacting an uncontaminated aquifer was considered low because the shallow aquifer is already above the drinking water standards. However, if the appropriate upgradient monitoring wells associated with a field showed no contamination in the shallow aquifer system, these circles were assigned a high-risk value because the shallow aquifer has not been previously contaminated, and the Port does not want to negatively impact this unimpacted portion of the shallow aquifer. Tables 1 and 2 summarize the results of this evaluation and the risk scoring, respectively.

4. Results

The Port's Winter Irrigation Compliance Plan proposed interim measures to minimize potential risks to the groundwater system and downgradient groundwater users from potential scenarios where there is insufficient acreage that meets the Permit's winter irrigation criteria. One of these interim measures is through the development of an irrigation field risk ranking system for the land application fields. This ranking will prioritize irrigation fields within the land application program that would provide the lowest risk to downgradient users if there is insufficient acreage to meet the Permit's winter irrigation criteria. Fields ranked as low risk will be prioritized to receive winter land application water if the permit criteria are exceeded while the Port's winter storage infrastructure project is being constructed.

Table 1 presents a summary of the evaluation of each parameter. The risk score for each individual parameter was summed together to develop the final risk score for each field. As part of this process, the Port used a conservative weighting system that gave more weight in the final ranking to the distance to the nearest downgradient domestic well. The domestic well risk rank was weighted at 50% of the total final score, with the other 4 parameters equally divided in weighting (i.e., each of the remaining parameters was weighted 12.5%). The final risk score for each field was then placed into one of three categories: low-risk, medium-risk, and high-risk. The final risk score for each field is presented in Table 1 and Figures 6a and 6b.

Farms 1 and 3

Figure 6a presents the risk score for the land application fields at Farms 1 and 3. All these fields scored as a low risk. This score for Farms 1 and 3 fields reflects the fact that there are no downgradient alluvial domestic wells that would be impacted by land application operations.

Farm 2

Farm 2 fields are mainly ranked as high risk (Figure 6a), primarily because of the location of multiple domestic wells downgradient of these fields (see Figure 2b).

Farms 4 and 5

Figure 6b presents the risk score for the land application fields at Farms 4 and 5. Across both farms there are low, medium, and high-risk fields. One of the drivers for these rankings is the distance to assumed domestic wells at nearby houses identified in the aerial photograph review (Attachment A). Other risk score drivers included the downgradient monitoring well increasing trends and these wells being greater than the background water quality at the farms.

Port of Morrow

Updated: 4/25/2023

Notes:
Downgradient well MW-9 - little POM farming occurs upgradient of this monitoring well & the MW is located directly downgradient of the City ponds.
Farm 1 - Circle 152 is a City of Boardman wastewater circle - Port does not use this circle
Port of Morrow 3 East Beach alluvial water supply wells were not considered in this evaluation because the Port controls these wells and continually manages the final nitrate water quality to always be < 10 mg/L
= depth to GW from center of field was not GIS derived; estimated based on google earth data and gw contours and adjacent field values.

Soil moisture holding capacity are derived from field capacity minus wilting point. Field capacity is derived from soil moisture datasets for each field by IRZ. No field moisture measurements are available for Field 149, so the SWHC was calculated from the NRCS estimate field capacity based on the soil type.

TABLE 2

Port of Morrow Land Application Program - Field Ranking Risk Scoring Approach

Winter Irrigation Compliance Plan

Port of Morrow

Risk Levels 1=Low, 2=Low-Medium, 3=Medium, 4=Medium-High, 5=High Risk

Closer to a domestic wells equates to higher risk

Downgradient Domestic Wells	
Risk Level	Distance to Well <i>(closest downgradient domestic well in gw flowpath - miles)</i>
1 <i>(Low)</i>	> 5 mi
2	4 - 5 mi
3	3 - 4 mi
4	2 - 3 mi
5 <i>(High)</i>	0 - 2 mi

Shallower depth to water table equates to higher risk

Depth to Alluvial Water Table	
Risk Level	Depth to GW <i>(ft bgs - circle center)</i>
1 <i>(Low)</i>	>60
2	45-60
3	30-45
4	15-30
5 <i>(High)</i>	0-15

Lower soil moisture holding capacity equates to higher risk

Soil Water Holding Capacity	
Risk Level	Holding Capacity <i>(in water/ft soil)</i>
1 <i>(Low)</i>	> 2.25
2	1.751 - 2.25
3	1.51 - 1.75
4	1.251 - 1.5
5 <i>(High)</i>	< = 1.25

POM Downgradient Monitoring Wells

- 1) Evaluating 2 different categories of information; Weighting the results to become one variable in final risk table
- 2) Weighting the results to become one variable in final risk table

Comparison of Compliance Well to the Background/Upgradient Well

greater than (>) Background/Upgradient Well = 5

Less than (<) Background/Upgradient Well = 1

Compliance Well - Nitrate Trend

Increasing = 5

Flat = 3

Decreasing = 1

Risk Level	Total Risk Score <i>(weighted evenly for each category)</i>
1 <i>(Low)</i>	1
2	2
3	3
4	4
5 <i>(High)</i>	5

Each Category is weighted 50% of the total risk score

	Comparison to Background Well	Current Trend	Comparison Risk Score	Trend Risk Score	Total Risk Score <i>(weighted evenly for each category)</i>
Farm 1 & 3					
MW-11, 5D	> Background Well	flat/decreasing	5	3	4
MW-24	< Background Well	increasing	1	5	3
MW-25	< Background Well	decreasing	1	1	1
MW-26	< Background Well	flat	1	3	2

Note: Farm 1& 3 based on statistical evaluation of data thru 2022, with trends from 2017 - 2022 dataset (post corrective actions plan)

Farm 2					
MW-12s	> Background Well	~ flat	5	3	4
MW-13c	> Background Well	increasing	5	5	5
MW-14s	< Background Well	~ flat	3	1	2

Note: Farm 2 results were based on professional judgement, with trends estimated from 2017 - 2022 dataset (post corrective actions plan)

Farm 4 (Madison Ranch)					
MW-101/105	< Background Well	~ flat	1	3	2
MW-101/108	> Background Well	~ flat	5	3	4
MW-102	> Background Well	~ flat	5	3	4
MW-103	> Background Well	increasing	5	5	5
Farm 5 (Mader-Rust)					
MW-106	≈ Background Well	~ flat	1	3	2
MW-108	≈ Background Well	~ flat	1	3	2

Circles 1, 2, 3 49, 50, & 101

Farm 5 downgradient wells
Farm 5 downgradient wells

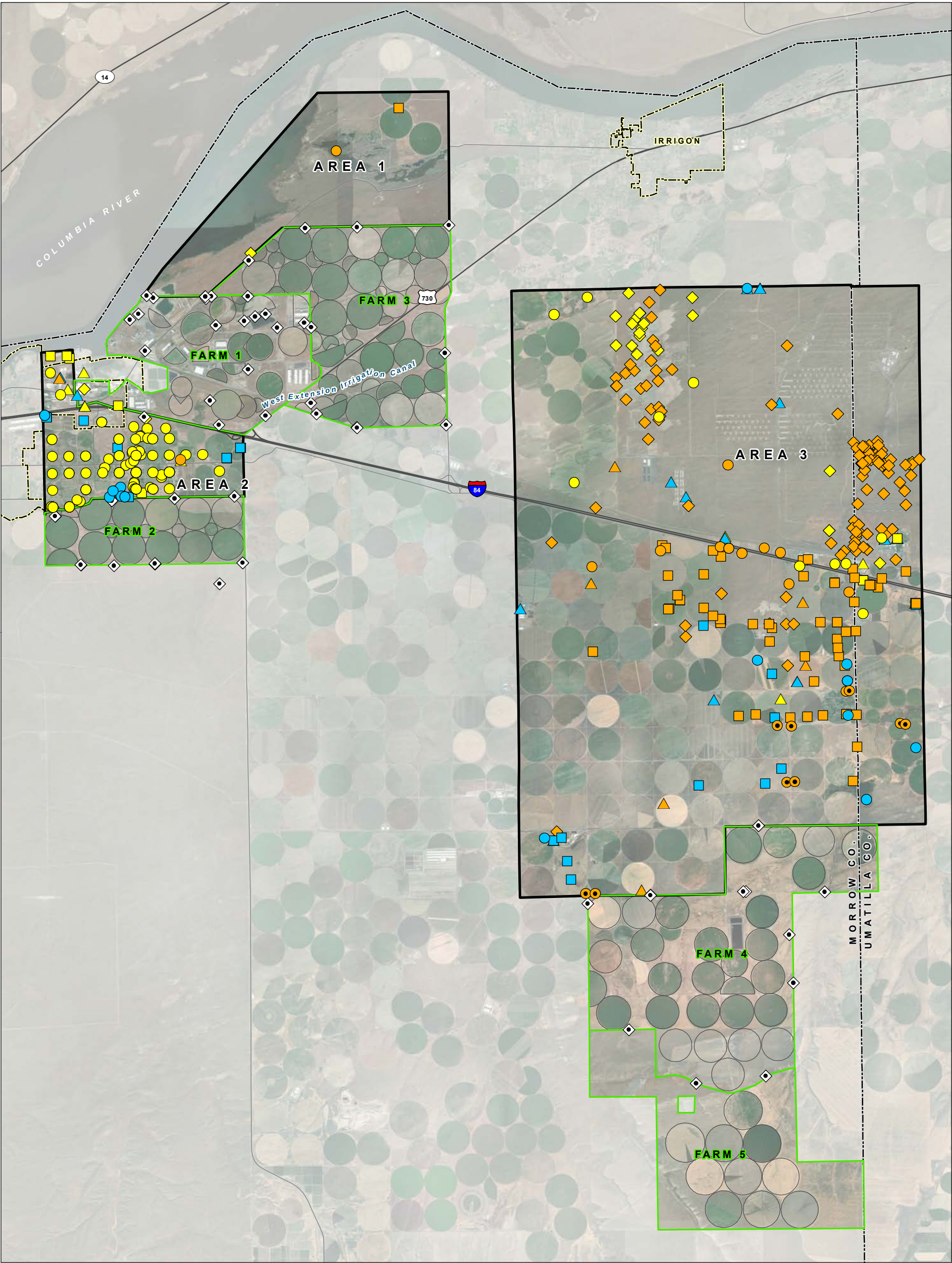
Little to no historic groundwater contamination is given higher score

Historically Contaminated Aquifer	
Risk Level	Historic Contamination
1 <i>(Low)</i>	Historic Contamination > 10 mg/L Nitrate
2	---
3	Historic Contamination 2 - 10 mg/L Nitrate
4	---
5 <i>(High)</i>	No Contamination

Farm 1, 2, & 3, and Madison Ranch Circles present prior to 2013

Madison Ranch Circle added after 2013

All other Madison Ranch circles, and Farm 5 Circles



LEGEND

- Well Search Area
- POM Farm
- Irrigation Circle

Aquifer

- Alluvial
- Basalt
- Unknown

Well Type

- Domestic
- Domestic, Assumed
- Irrigation
- Monitoring
- Monitoring, POM
- Other¹

All Other Features

- County Boundary
- City Boundary
- Major Road

NOTE

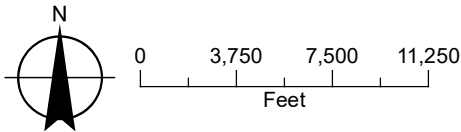
1. Other wells include: livestock, industrial, dewatering, and unknown

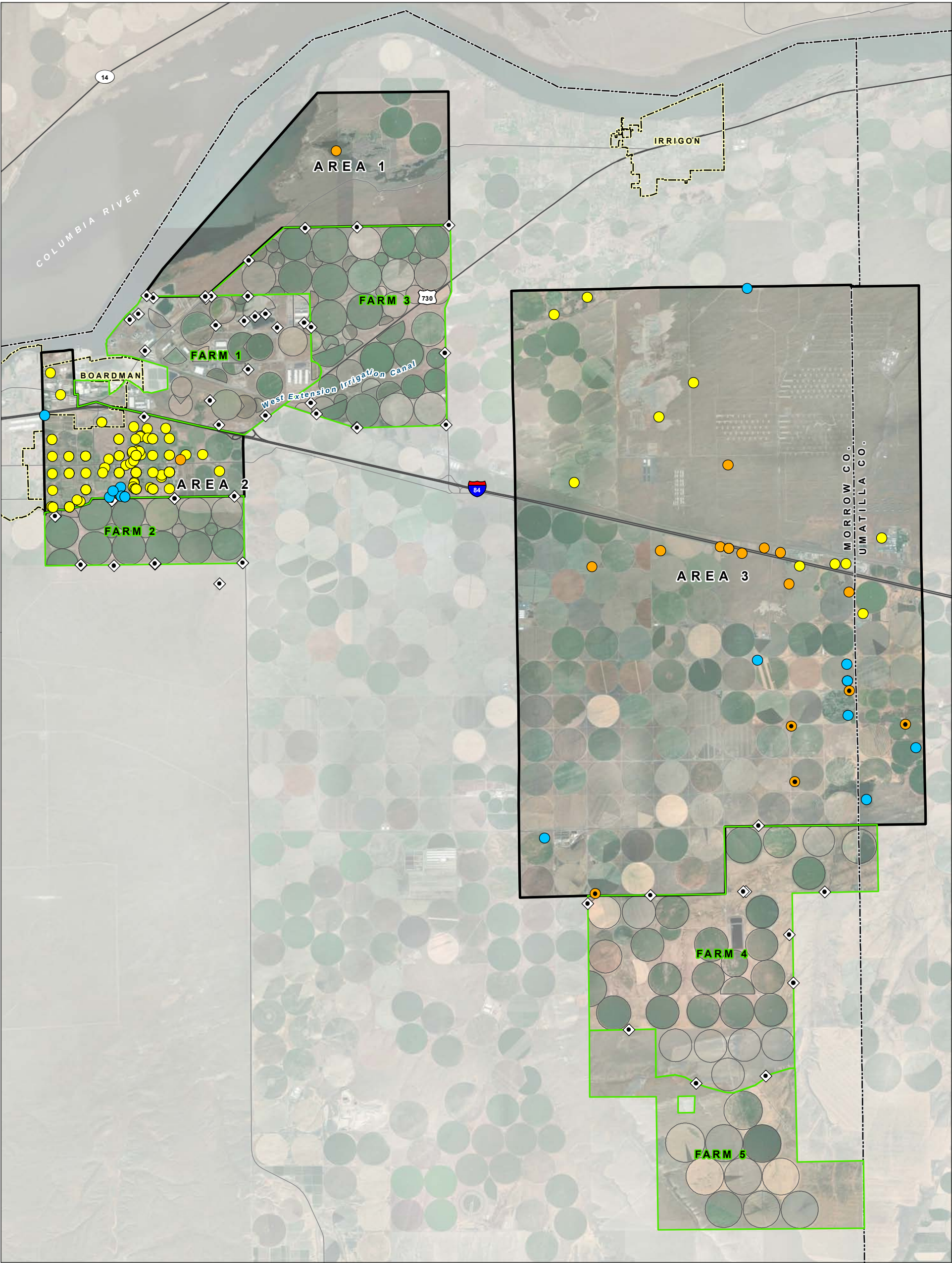
Date: May 8, 2023
Data Sources: BLM, ESRI, ODOT, USGS, Aerial Photo 2020

FIGURE 1a

Well Overview - All Wells

Port of Morrow Land Application Farms and Downgradient Groundwater Flow Areas





LEGEND

Well Search Area

POM Farm

Irrigation Circle

Aquifer

Alluvial

Basalt

Unknown

Well Type

Domestic

Domestic, Assumed

Monitoring, POM

All Other Features

County Boundary

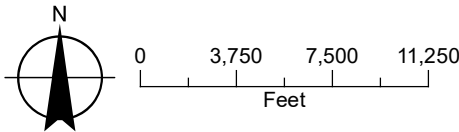
City Boundary

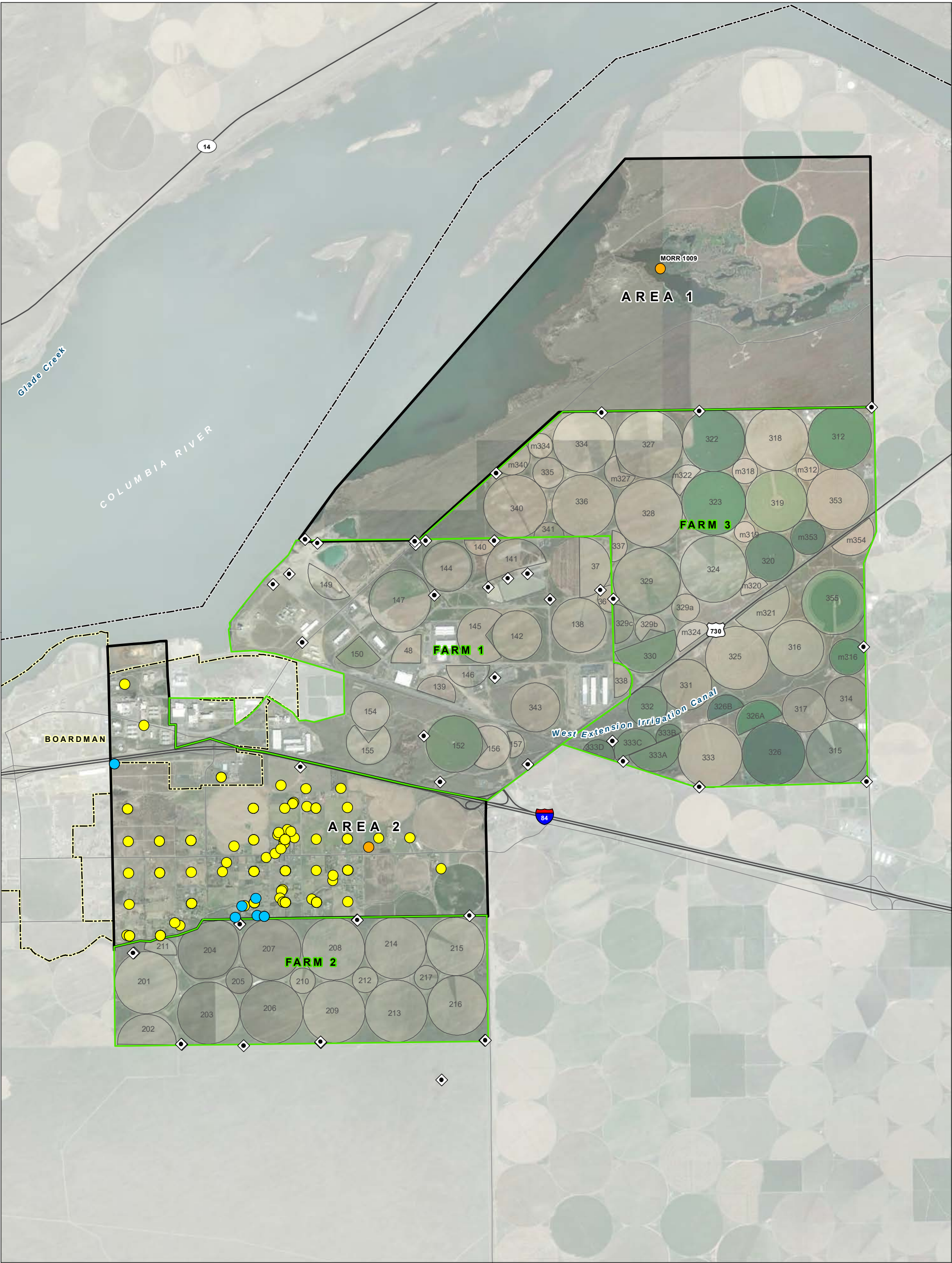
Major Road

FIGURE 1b

Well Overview - Domestic Wells

Port of Morrow Land Application Farms
and Downgradient Groundwater Flow Areas





LEGEND

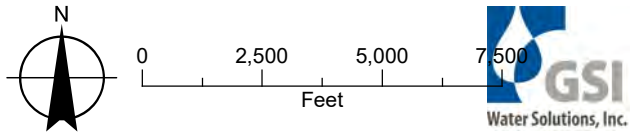
- | | |
|-------------------|---------------------------|
| Well Search Area | Well Type |
| POM Farm | Domestic |
| Irrigation Circle | Monitoring, POM |
| Aquifer | All Other Features |
| Alluvial | County Boundary |
| Basalt | City Boundary |
| Unknown | Major Road |

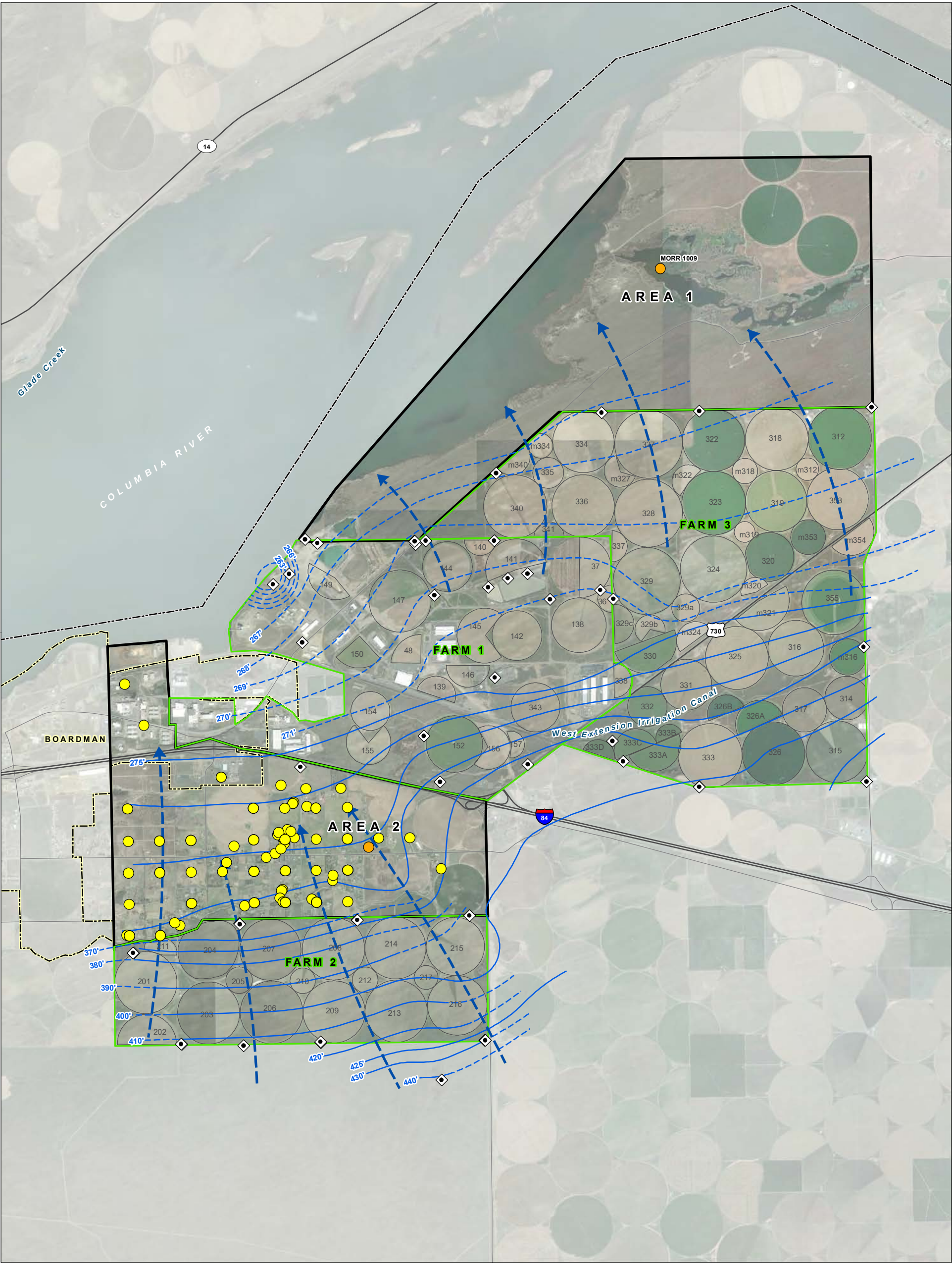
Date: November 10, 2022
Data Sources: BLM, ESRI, ODOT, USGS, Aerial Photo 2020

FIGURE 2a

**Farms 1, 2, and 3
Downgradient Domestic Wells**

Port of Morrow Land Application Farms
and Downgradient Groundwater Flow Areas





LEGEND

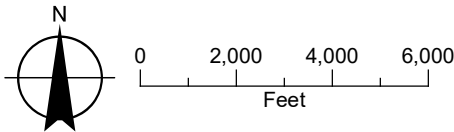
- Groundwater Contour
- Groundwater Contour, Inferred
- Groundwater Flow
- Well Search Area
- POM Farm
- Irrigation Circle
- Aquifer**
 - Alluvial
 - Unknown

- Well Type**
 - Domestic
 - Monitoring, POM
- All Other Features**
 - County Boundary
 - City Boundary
 - Major Road

FIGURE 2b

**Groundwater Flow Direction
Farms 1, 2 and 3**

Port of Morrow Land Application Farms
and Downgradient Groundwater Flow Areas



Date: November 10, 2022
Data Sources: BLM, ESRI, ODOT, USGS, Aerial Photo 2020

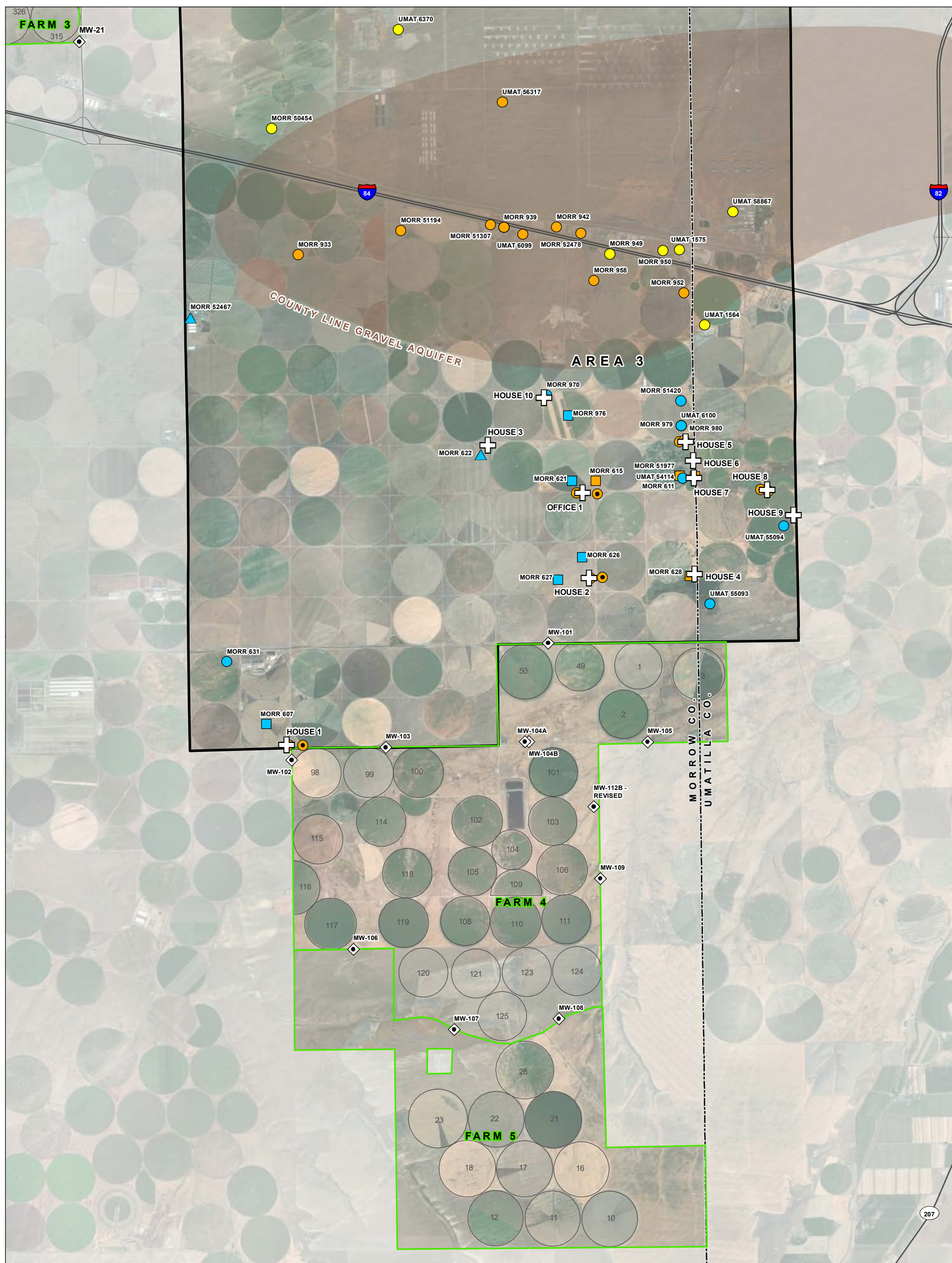


FIGURE 3a

Farm 4 and Farm 5 Downgradient Domestic Wells (Alluvial and Basalt)

Port of Morrow Land Application Farms and Downgradient Groundwater Flow Areas

LEGEND

-  Possible House/Office
-  Well Search Area
-  POM Farm
-  Irrigation Circle
-  County Line Gravel Aquifer

Aquifer

- Alluvial
 Basalt
 Unknown

Well Type

- ☐ Domestic
- ☒ Domestic, Assumed
- ☐ Irrigation
- ☒ Monitoring, POM
- ☐ Other¹

All Other Features

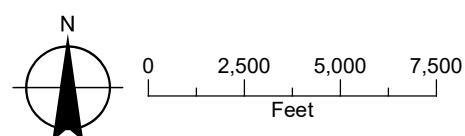
-  County Boundary
 City Boundary
 Major Road

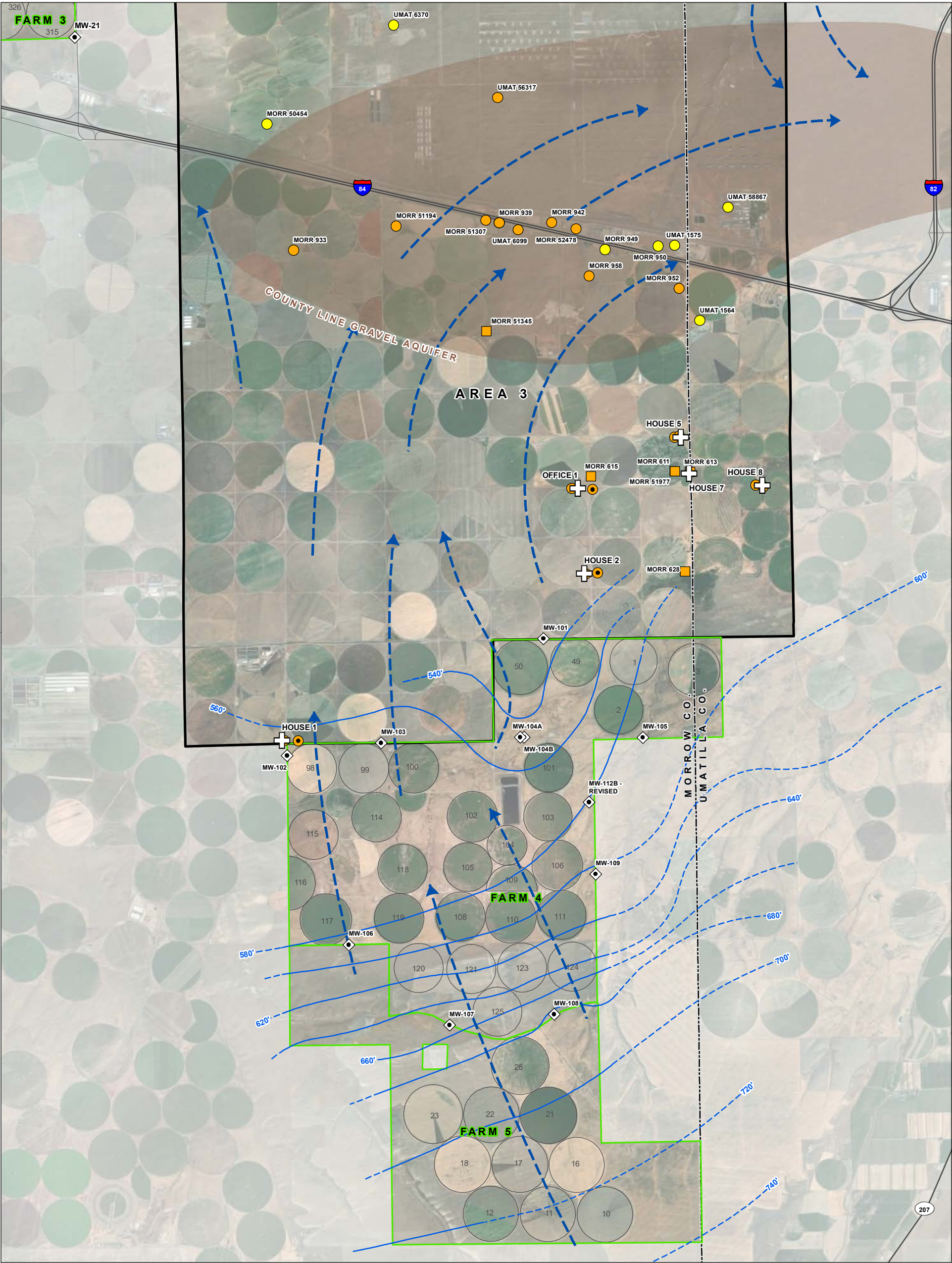
NOTE

NOTE

1. Other wells include: livestock, industrial, dewatering, and unknown

Date: May 8, 2023
Data Sources: BLM, ESRI, ODOT, USGS, Aerial Photo 2020





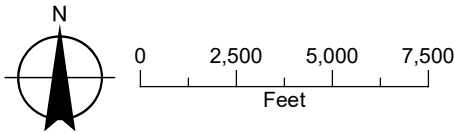
LEGEND

- Possible House/Office
- Groundwater Contour
- Groundwater Contour, Inferred
- Groundwater Flow
- Well Search Area
- POM Farm
- Irrigation Circle
- County Line Gravel Aquifer

- Aquifer**
- Alluvial
 - Unknown
- Well Type**
- Domestic
 - Domestic, Assumed
 - Irrigation
 - Monitoring, POM

- All Other Features**
- County Boundary
 - City Boundary
 - Major Road

FIGURE 3b
Groundwater Flow Direction
Farm 4 and Farm 5 Domestic Alluvial Wells Only
Port of Morrow Land Application Farms
and Downgradient Groundwater Flow Areas



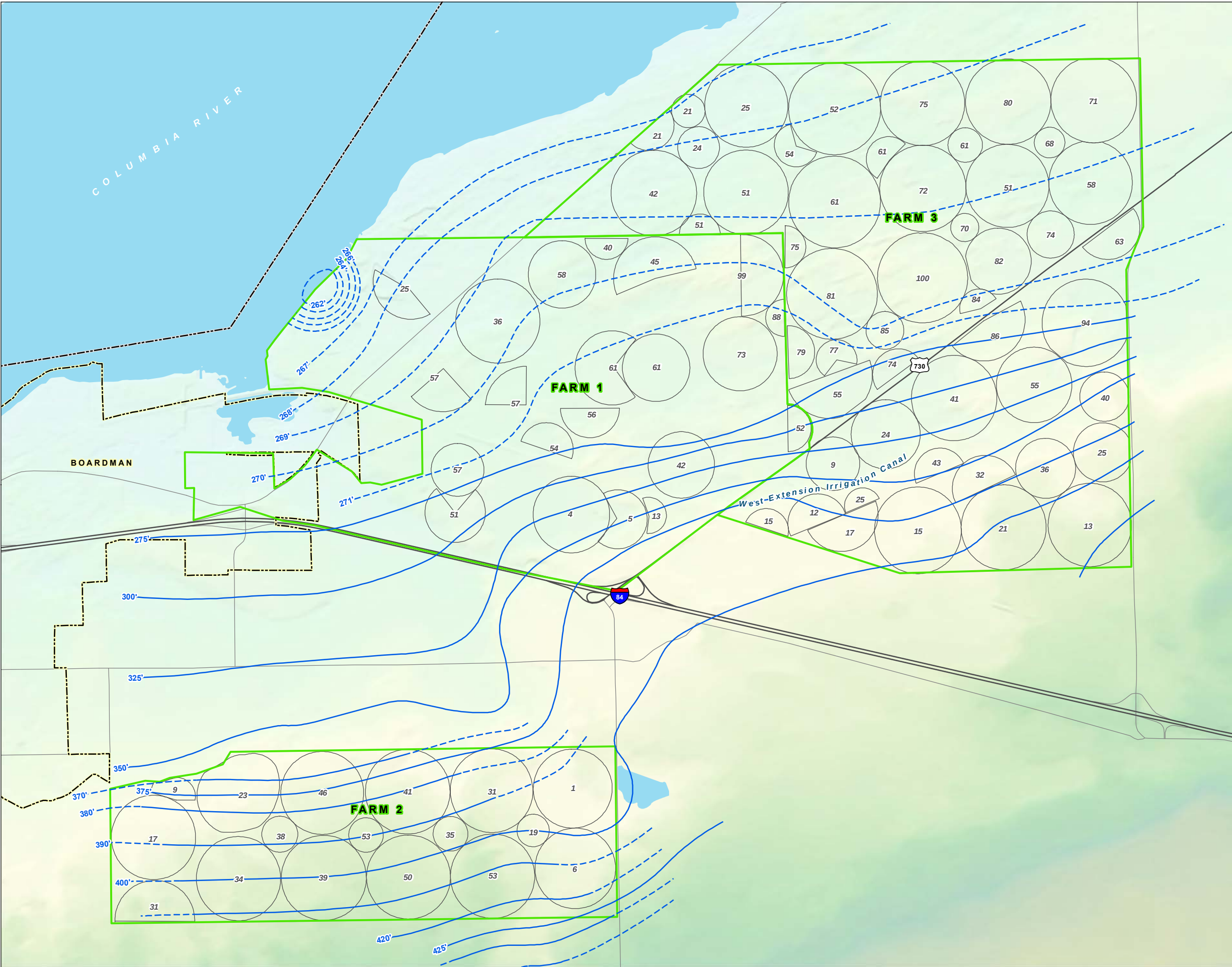
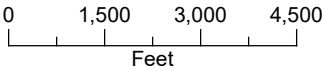
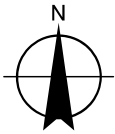


FIGURE 4a
Depth to Groundwater of
Farms 1, 2, and 3
Port of Morrow
Land Application Farms and
Downgradient Groundwater
Flow Areas

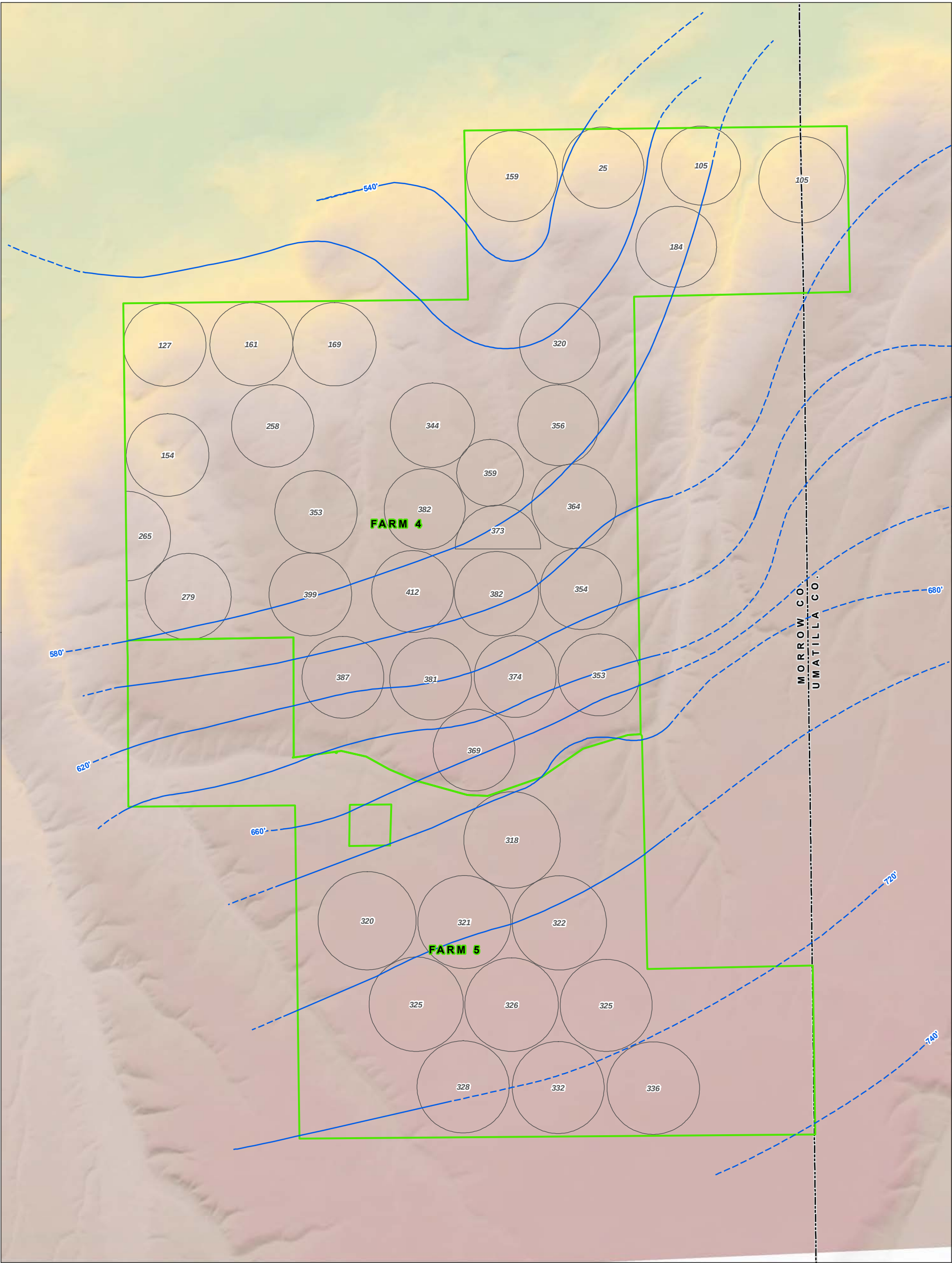
LEGEND

- Irrigation Circle with Depth to Groundwater (at center of pivot)
- Groundwater Contour
- Groundwater Contour, Inferred
- POM Farm
- Elevation**
 - High: 340'
 - Low: 80'
- All Other Features**
 - County Boundary
 - City Boundary
 - Major Road
 - Waterbody



Date: November 10, 2022
Data Sources: BLM, ESRI, ODOT, USGS,
Aerial Photo 2020





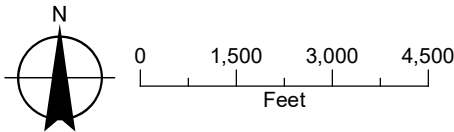
LEGEND

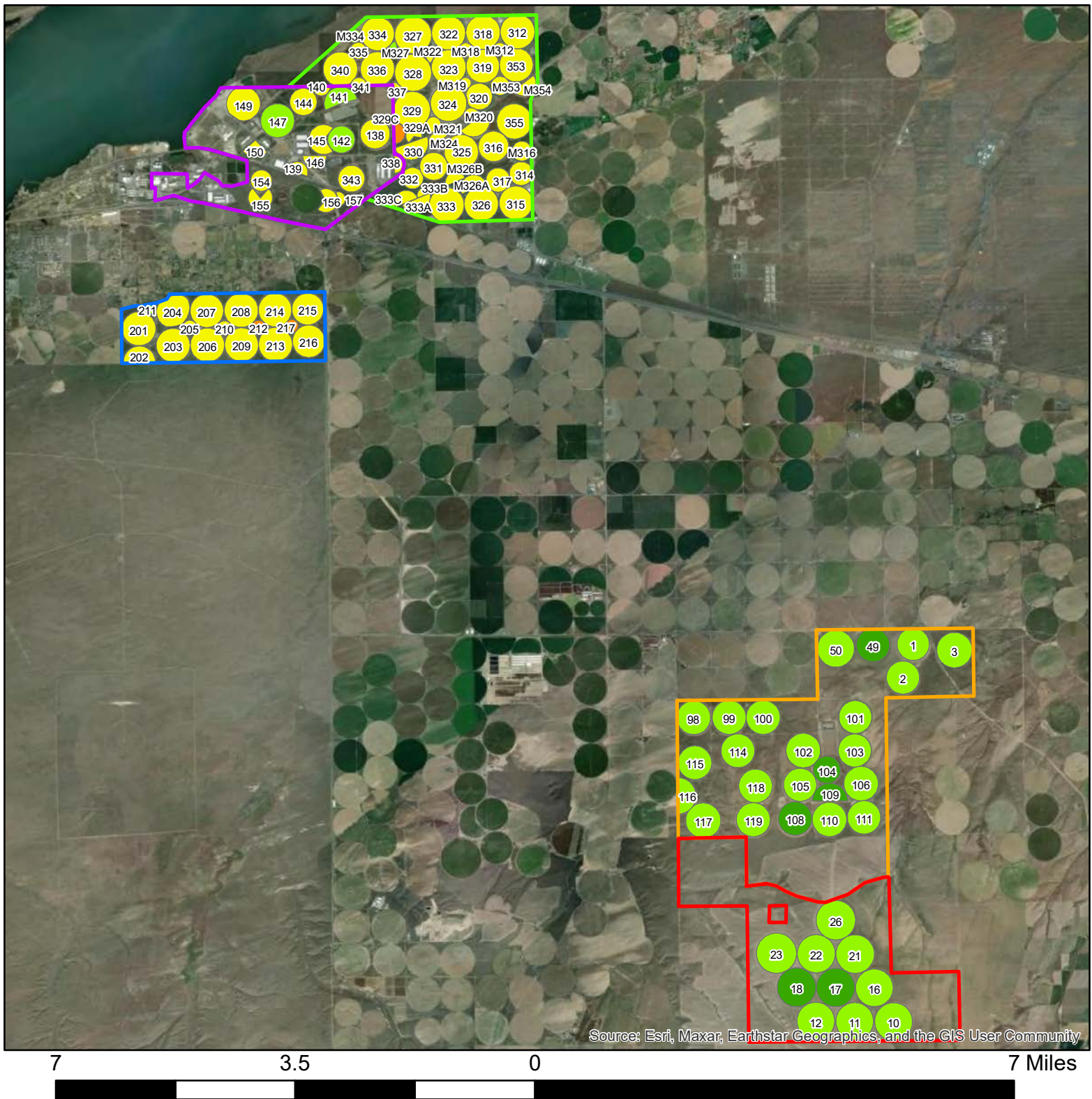
- Irrigation Circle with Depth to Groundwater (at center of pivot)
- Groundwater Contour
- Groundwater Contour, Inferred
- POM Farm
- Elevation**
 - High: 340'
 - Low: 80'

- All Other Features**
- County Boundary
 - Major Road

FIGURE 4b

Depth to Groundwater of Farms 4 and 5
Port of Morrow Land Application Farms and Downgradient Groundwater Flow Areas





Legend

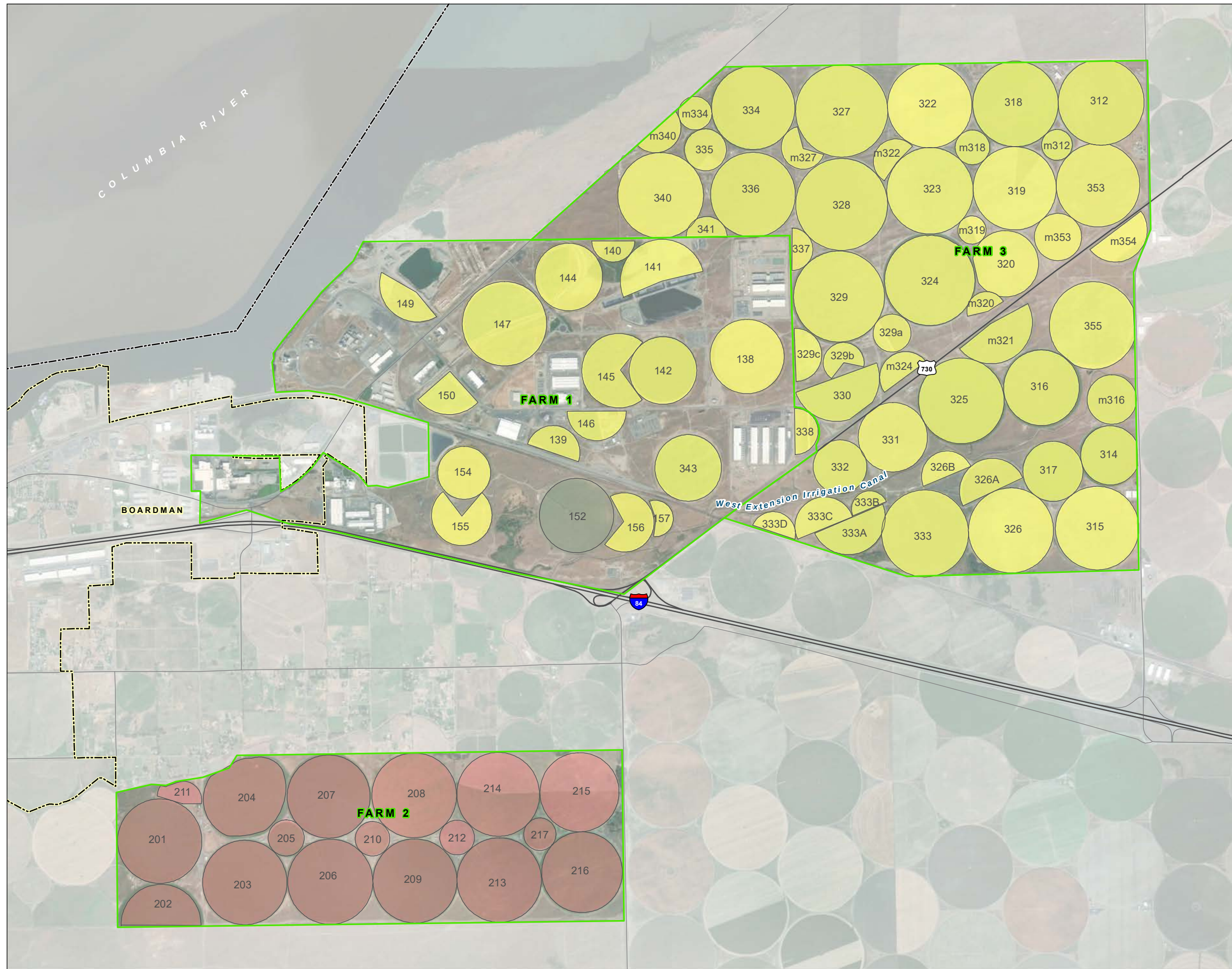
Farms	Average soil water holding capacity (inches water / foot soil)
 Farm 1	 ≤ 1.25 Rank = 5
 Farm 2	 1.26 - 1.50 Rank = 4
 Farm 3	 1.51 - 1.75 Rank = 3
 Farm 4	 1.76 - 2.25 Rank = 2
 Farm 5	 > 2.25 Rank = 1

Average soil water holding capacity, 0-5 ft bgs



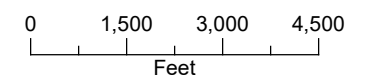
Figure 5

FIGURE 6a
Irrigation Field Risk Summary,
Farms 1, 2, and 3
(Weighted)
 Port of Morrow
 Land Application Farms



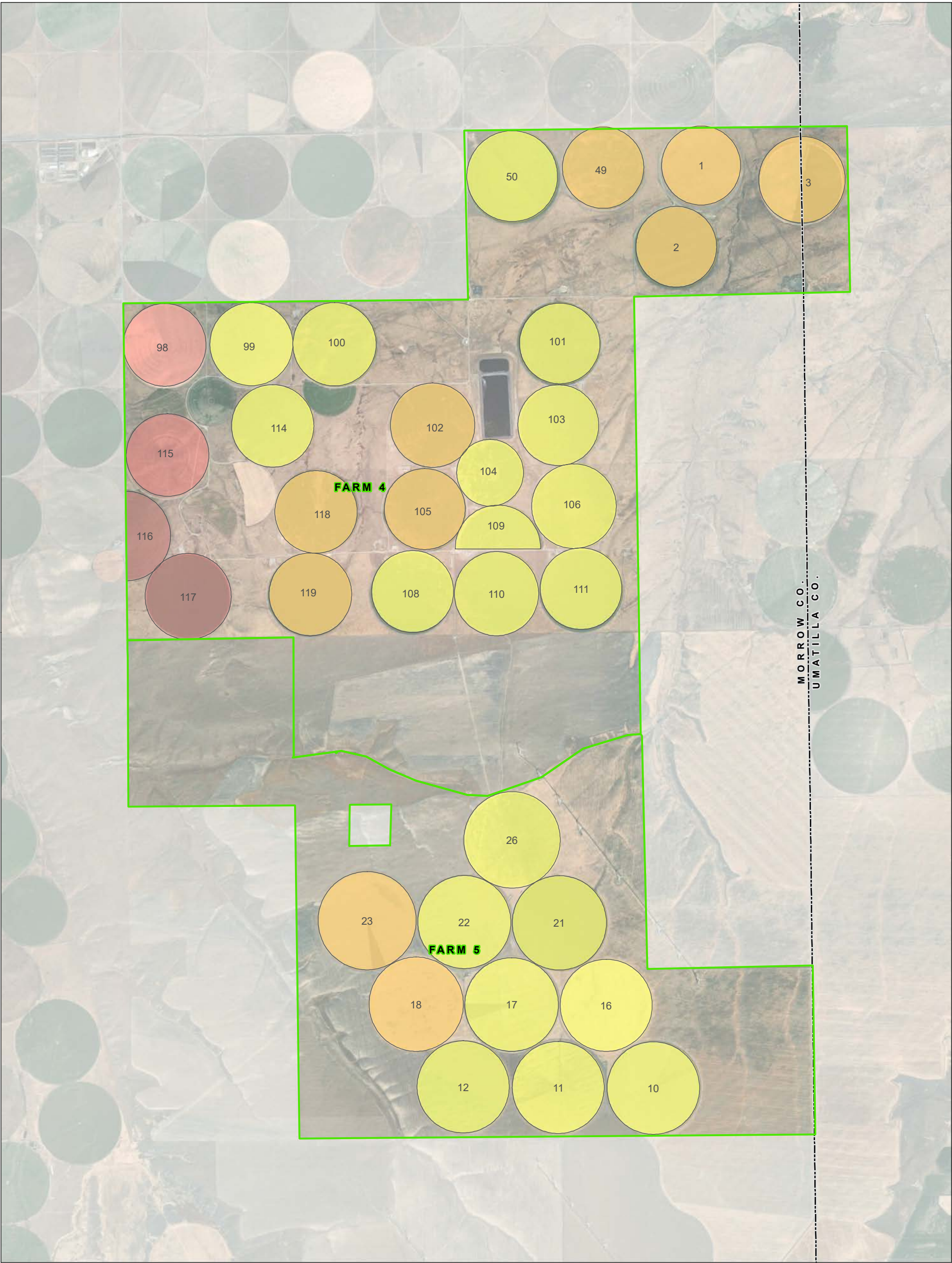
LEGEND

- POM Farm
- Irrigation Circle
- All Other Features**
 - County Boundary
 - City Boundary
 - Major Road
- Risk Score, Weighted**
 - Low
 - Medium
 - High



Date: October 26, 2023
 Data Sources: BLM, ESRI, ODOT, USGS,
 Aerial Photo 2020





LEGEND

- POM Farm
- Irrigation Circle

All Other Features

- County Boundary
- City Boundary
- Major Road

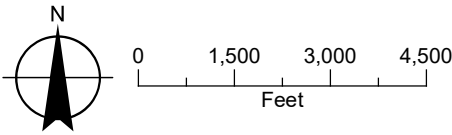
Risk Score, Weighted

- Low
- Medium
- High

FIGURE 6b

Irrigation Field Risk Summary, Farms 4 and 5 (Weighted)

Port of Morrow Land Application Farms and Downgradient Groundwater Flow Areas



ATTACHMENT A

Aerial Photograph Review – Domestic Well Search

HOUSE 1



HOUSE 2



HOUSE 3



HOUSE 4



FIGURE A-1a
House Details
Port of Morrow

LEGEND

- Well Search Area
- Possible House/Office

Well Type

- Domestic
- Domestic, Assumed
- Irrigation
- Monitoring
- Other¹

Aquifer

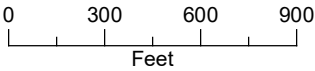
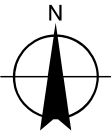
- Alluvial
- Basalt
- Unknown

All Other Features

- County Boundary
- City Boundary
- Major Road
- Watercourse
- Waterbody

NOTE

1. Other wells include: livestock, industrial, dewatering, and unknown



Date: August 31, 2018
Data Sources: Port of Morrow, OGIC, ESRI

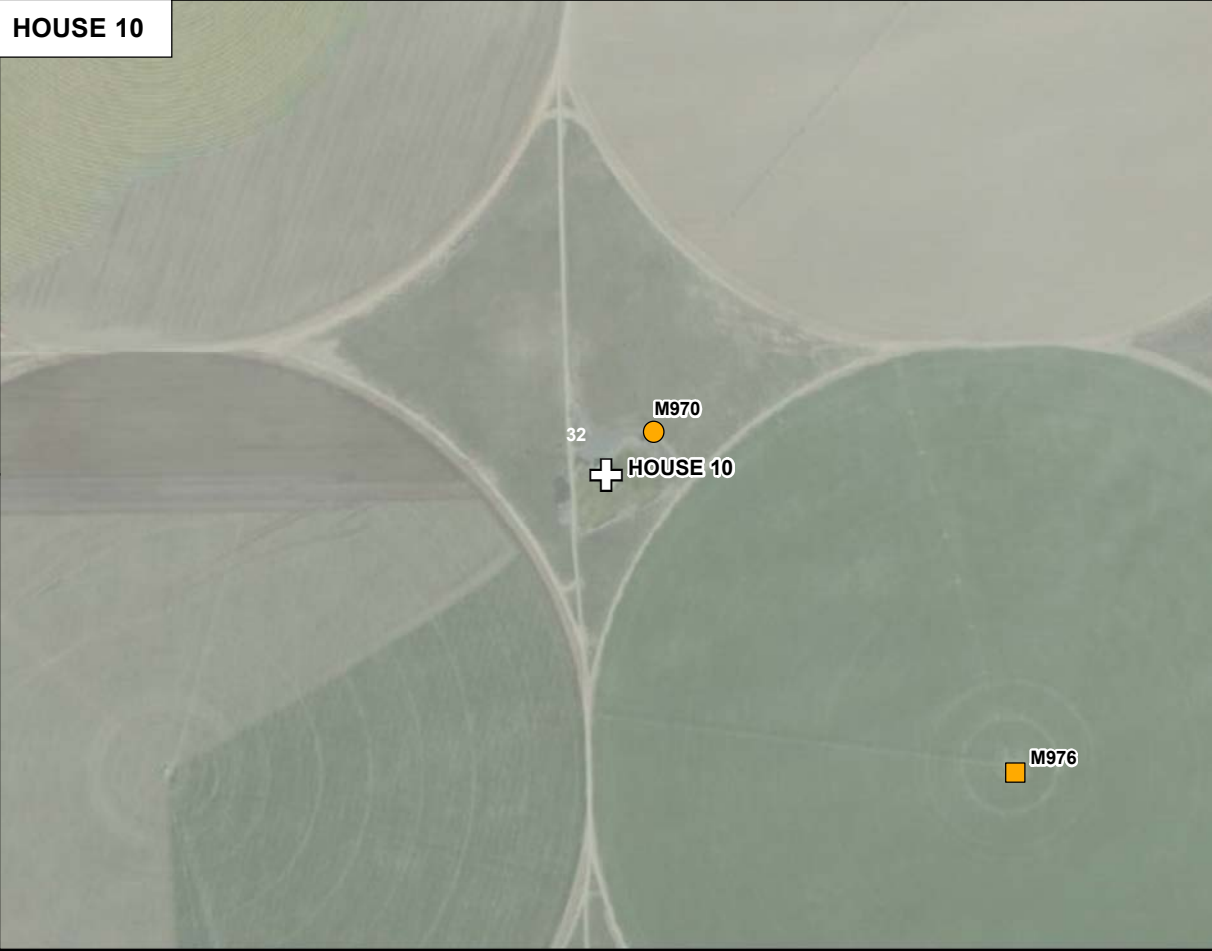


FIGURE A-1b
House/Office Details
Port of Morrow

LEGEND

- Well Search Area
- Possible House/Office

Well Type

- Domestic
- Domestic, Assumed
- Irrigation
- Monitoring
- Other¹

Aquifer

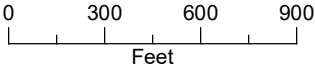
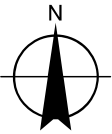
- Alluvial
- Basalt
- Unknown

All Other Features

- County Boundary
- City Boundary
- Major Road
- Watercourse
- Waterbody

NOTE

1. Other wells include: livestock, industrial, dewatering, and unknown



Date: August 31, 2018
Data Sources: Port of Morrow, OGIC, ESRI



TECHNICAL MEMORANDUM

Land Application - Irrigation Circle Risk Ranking Winter Irrigation Compliance Plan *October 2023 Update*

To: Miff Devin, Port of Morrow
From: Bruce Brody-Heine, GSI Water Solutions, Inc..
Date: May 5, 2023; *Updated October 25, 2023*

1. Introduction

The Port of Morrow (Port) operates an industrial wastewater land application program on the farmlands in the vicinity of the Port's Boardman Industrial Park. The program operates under an Oregon Department of Environmental Quality (DEQ) water pollution control facilities (WPCF) land application permit, as modified on November 2, 2022 (Permit No. 102325 Modification 1) (Permit).

The modified Permit retains restrictions on the application of wastewater during the designated non-growing (winter) season of November through February and effectively requires the Port to eliminate all land application during the winter, beginning on November 1, 2025. The Permit modification includes a schedule of required wastewater treatment, storage, and other measures to achieve these restrictions. While these infrastructure projects are under construction, the Port's Winter Irrigation Compliance Plan (May 2023) includes proposed interim measures to minimize potential risks to the groundwater system and downgradient groundwater users from the application of wastewater during the non-growing season to sites that do not meet the Permit's non-growing season soil nitrate and moisture criteria.

In May 2023, the Port submitted a memorandum that summarized the evaluation and ranking of the Port's land application fields with respect to groundwater risks to identify areas that can be prioritized for winter irrigation if there is insufficient acreage that meets the Permit's winter irrigation criteria. The goal of this interim measure is directing wastewater, when needed, to fields with the lowest risk of impacting both shallow groundwater and downgradient groundwater users (i.e., alluvial domestic drinking water wells).

This memorandum updates the May 2023 circle ranking based on updated groundwater contours that have been developed for Farms 4 and 5 following the incorporation of new and additional groundwater data, and also ranks an additional 18 circles or partial circles on Farm 4 that are part of the Port's WPCF Permit Expansion project.

2. Approach

The Port used the same parameters to define the risk that will minimize the risk of nitrate movement to the shallow groundwater system if wastewater must be applied to fields that do not meet the Permit's winter irrigation soil nitrate and moisture criteria as documented in the May 2023 memorandum. These parameters include:

1. Inventory of Domestic Water Supply Wells Downgradient from the Land Application Program. The Port has identified downgradient alluvial groundwater supply wells that are being used for domestic purposes and the distance to these wells from the center of each field within the Port's land application farms.
2. Depth to Groundwater. The depth to the groundwater table was evaluated at the center of each pivot and used to rank fields within the land application boundaries.
3. Soil Water Holding Capacity. The hydraulic properties of the soils at each field were evaluated and used to rank fields within the land application boundaries.
4. Review Current Land Application Program Downgradient Groundwater Monitoring Well Datasets. The Port monitors the alluvial groundwater quality at the upgradient and downgradient boundary of its land application program. This data was reviewed to assess the condition and trend of the water quality (nitrate concentrations) across the downgradient boundary of an area to assess how the system is responding to current/past land application practices.
5. Alluvial Aquifer Currently Impacted or Not Impacted. The current status of the alluvial aquifer and if it currently is impacted or if it is un-impacted was also evaluated for each field.

Because the new data and fields are only associated with Farms 4 and 5, only the parameters at these two Farms are part of this evaluation process. The circle ranking for Farms 1, 2 and 3 were not modified and Figure 1 presents the May 2023 results for those Farms. Table 1 provides a summary of this new evaluation and resulting risk scores for the current and new circles at Farms 4 and 5.

3. Farm 4 and 5 Updated Field Ranking

Two sets of new information are available for Farms 4 and 5 and were incorporated into this Field Ranking evaluation; 1) new shallow groundwater elevation data to the west and east of the Farms provided new insight into the alluvial groundwater flow patterns on the periphery of the Farms, and 2) new Farm 4 monitoring wells associated with the permit expansion were installed on the eastern side of Farm 4. This new information was incorporated into the evaluation of the existing circles and the 18 new circles at Farms 4 and 5.

As previously completed, each of the five parameters outlined above were evaluated and a risk level was assigned based on the datasets. Table 1 presents the summary of each parameter's evaluation and the associated risk score from 1 (low risk) to 5 (high risk). The assigned risk scoring ranges for each parameter are presented on the top of Table 1 and in Table 2 and as described in the May 2023 memorandum.

3.1 Domestic Well Locations

Figure 2 shows the updated groundwater flow directions, based on the updated groundwater contours. The flow-paths from some fields to the nearest identified down-gradient domestic well have changed since the May 2023 memorandum. The updated distances for these fields are also shaded in orange on Table 1.

3.2 Depth to Groundwater from Field Surface

New shallow groundwater elevation data to the west of Farms 4 and 5 (from Lost Valley Farms) provides new insight into the alluvial groundwater flow patterns on the western portion of the Farm. The three new Farm 4 monitoring wells associated with the permit expansion project and additional monitoring wells located to the east of Farm 4 were used in refining the Farms 4 and 5 shallow groundwater contour map in consultation with DEQ. Updated groundwater contours are shown in the revised Figure 2. The updated groundwater contours were used to determine the depth to groundwater below each field. Fields with updated depth to groundwater are highlighted in orange on Table 1.

3.3 Soil Water Holding Capacity

The soil water holding capacity is the amount of water that a given soil can hold for crop use, or in different terms, the quantity of water that can be stored in the root zone. The Port, with the help of IRZ Consulting

developed soil water holding capacity values for the 18 new land application circles. A higher soil water holding capacity is considered a lower risk than fields with lower soil water holding capacity. The soil water holding capacity is listed for each new field in Table 1. No changes were made to the existing fields.

3.4 Port Downgradient Monitoring Program Trends

The water quality results were updated with June 2023 results and reviewed for all the circles that existed prior to this evaluation. The cells highlighted in grey in Table 1 represent values that changed based on June 2023 quarterly groundwater sampling results. The June 2023 data were used for evaluation of the 18 new circles.

3.5 Aquifer Contamination History

Because the 18 new fields at Farms 4 and 5 are new and have not been farmed prior to the start of the Port's land application program in 2017, it was assumed that there is no prior contamination at these locations and therefore received a "high" risk level for this parameter. No changes were made to the existing fields.

4. Results

The Port's irrigation field risk ranking system for the land application fields prioritizes irrigation fields within the land application program that provide the lowest risk to downgradient users if there is insufficient acreage to meet the Permit's winter irrigation criteria. Fields ranked as low risk will be prioritized to receive winter land application water if the permit criteria are exceeded while the Port's winter storage infrastructure project is being constructed.

The risk score for each individual parameter was summed together to develop the final risk score for each field. As part of this process, the Port used a conservative weighting system that gave more weight in the final ranking to the distance to the nearest downgradient domestic well. The domestic well risk rank was weighted at 50% of the total final score, with the other 4 parameters equally divided in weighting (i.e., each of the remaining parameters was weighted 12.5%). The final risk score for each field was then placed into one of three categories: low-risk, medium-risk, and high-risk.

Table 1 presents a summary of the evaluation of each parameter and Figures 1 and 3 summarize the risk score into low-risk, medium-risk, and high-risk category. The results of the evaluation using the new groundwater contour datasets for the existing and new fields at Farms 4 and 5 are presented on Figure 2.

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TABLE 1
Port of Morrow Land Application Program Field Ranking
Winter Irrigation Compliance Plan
Port of Morrow

		Risk Level	Distance to Well			Risk Level	Depth to GW			Risk Level	Holding Capacity			Risk Level	
		1 (Low)	> 5 mi			1 (Low)	>60			1 (Low)	> 2.25			1 - 2 (Low)	
		2	4 - 5 mi			2	45-60			2	1.751 - 2.25			---	
		3	3 - 4 mi			3	30-45			3	1.51 - 1.75			2 - 3.5	
		4	2 - 3 mi			4	15-30			4	1.251 - 1.5			3.5 - 5 (High)	
		5 (High)	0 - 2 mi			5 (High)	0-15			5 (High)	<= 1.25				
Updated: 10/10/2023															
Circle #	Acres	Downgradient Domestic Wells			Depth to Alluvial Water Table		Soil Water Holding Capacity		POM Downgradient Monitoring Wells				Historically Contaminated Alluvial Aquifer		TOTAL RISK SCORE (Weighted) (max = 5; min = 1)
		Distance to Domestic Well (closest downgradient domestic well in gw flowpath - miles)	Risk Level		Depth to Water (ft bgs - center of circle)	Risk Level	Water Holding Capacity (in water/ft soil)	Risk Level	Compliance Well	Comparison to Background Well	Current Trend	Risk Level	Historical Contamination (Based on Age of Field)	Risk Level	
Farm 1															
138	85	No well downgradient	1		73	1	1.65	3	MW-25	< Background Well	decreasing	1	Yes > 10 mg/L Nitrate	1	1.25
139	23	No well downgradient	1		54	2	1.66	3	MW-11, 5D	> Background Well	flat/decreasing	4	Yes > 10 mg/L Nitrate	1	1.75
140	16	No well downgradient	1		41	3	1.68	3	MW-24	< Background Well	increasing	3	Yes > 10 mg/L Nitrate	1	1.75
141	36	No well downgradient	1		45	3	1.80	2	MW-24	< Background Well	increasing	3	Yes > 10 mg/L Nitrate	1	1.625
142	76	No well downgradient	1		61	1	1.76	2	MW-24	< Background Well	increasing	3	Yes > 10 mg/L Nitrate	1	1.375
144	24	No well downgradient	1		58	2	1.74	3	MW-24	< Background Well	increasing	3	Yes > 10 mg/L Nitrate	1	1.625
145	65	No well downgradient	1		61	1	1.58	3	MW-24	< Background Well	increasing	3	Yes > 10 mg/L Nitrate	1	1.5
146	17	No well downgradient	1		56	2	1.74	3	MW-11, 5D	> Background Well	flat/decreasing	4	Yes > 10 mg/L Nitrate	1	1.75
147	55	No well downgradient	1		36	3	1.82	2	MW-11, 5D	> Background Well	flat/decreasing	4	Yes > 10 mg/L Nitrate	1	1.75
149	24.1	No well downgradient	1		25	4	1.59	3	MW-11, 5D	> Background Well	flat/decreasing	4	Yes > 10 mg/L Nitrate	1	2
150	34	No well downgradient	1		57	2	1.60	3	MW-11, 5D	> Background Well	flat/decreasing	4	Yes > 10 mg/L Nitrate	1	1.75
154	50	No well downgradient	1		57	2	1.71	3	MW-11, 5D	> Background Well	flat/decreasing	4	Yes > 10 mg/L Nitrate	1	1.75
155	47	No well downgradient	1		51	2	1.60	3	MW-11, 5D	> Background Well	flat/decreasing	4	Yes > 10 mg/L Nitrate	1	1.75
156	38	No well downgradient	1		5	5	1.70	3	MW-24	< Background Well	increasing	3	Yes > 10 mg/L Nitrate	1	2
157	12	No well downgradient	1		13	5	1.60	3	MW-24	< Background Well	increasing	3	Yes > 10 mg/L Nitrate	1	2
Farm 2															
201	125	0.40	5		17	4	1.56	3	MW-12s	> Background Well	~ flat	4	Yes > 10 mg/L Nitrate	1	4
202	66.4	0.79	5		31	3	1.58	3	MW-12s	> Background Well	~ flat	4	Yes > 10 mg/L Nitrate	1	3.875
203	126	0.73	5		35	3	1.56	3	MW-12s	> Background Well	~ flat	4	Yes > 10 mg/L Nitrate	1	3.875
204	126	0.32	5		23	4	1.61	3	MW-12s	> Background Well	~ flat	4	Yes > 10 mg/L Nitrate	1	4
205	21.4	0.51	5		38	3	1.52	3	MW-13c	> Background Well	increasing	5	Yes > 10 mg/L Nitrate	1	4
206	126	0.76	5		39	3	1.52	3	MW-13c	> Background Well	increasing	5	Yes > 10 mg/L Nitrate	1	4
207	125	0.26	5		46	2	1.53	3	MW-13c	> Background Well	increasing	5	Yes > 10 mg/L Nitrate	1	3.875
208	126	0.39	5		41	3	1.61	3	MW-13c	> Background Well	increasing	5	Yes > 10 mg/L Nitrate	1	4
209	129	0.88	5		50	2	1.57	3	MW-13c	> Background Well	increasing	5	Yes > 10 mg/L Nitrate	1	3.875
210	21	0.60	5		53	2	1.58	3	MW-13c	> Background Well	increasing	5	Yes > 10 mg/L Nitrate	1	3.875
211	16.2	0.09	5		9	5	1.83	2	MW-12s	> Background Well	~ flat	4	Yes > 10 mg/L Nitrate	1	4
212	18.6	0.64	5		35	3	1.48	4	MW-14s	< Background Well	decreasing	2	Yes > 10 mg/L Nitrate	1	3.75
213	126	0.95	5		53	2	1.52	3	MW-14s	< Background Well	decreasing	2	Yes > 10 mg/L Nitrate	1	3.5
214	93.1	0.53	5		32	3	1.57	3	MW-14s	< Background Well	decreasing	2	Yes > 10 mg/L Nitrate	1	3.625
215	56.9	0.62	5		1	5	1.51	3	MW-14s	< Background Well	decreasing	2	Yes > 10 mg/L Nitrate	1	3.875
216	116	1.10	5		6	5	1.51	3	MW-14s	< Background Well	decreasing	2	Yes > 10 mg/L Nitrate	1	3.875
217	18.8	0.87	5		19	4	1.50	4	MW-14s	< Background Well	decreasing	2	Yes > 10 mg/L Nitrate	1	3.875
Farm 3															
312	125.2	No well downgradient	1		71	1	1.56	3	MW-26	< Background Well	flat	2	Yes > 10 mg/L Nitrate	1	1.375
m312	17.8	No well downgradient	1		68	1	1.56	3	MW-26	< Background Well	flat	2	Yes > 10 mg/L Nitrate	1	1.375
314	64.2	No well downgradient	1		25	4	1.68	3	MW-26	< Background Well	flat	2	Yes > 10 mg/L Nitrate	1	1.75
315	121.1	No well downgradient	1		13	5	1.72	3	MW-26	< Background Well	flat	2	Yes > 10 mg/L Nitrate	1	1.875
316	106.6	No well downgradient	1		55	2	1.62	3	MW-26	< Background Well	flat	2	Yes > 10 mg/L Nitrate	1	1.5
m316	41.6	No well downgradient	1		40	3	1.58	3	MW-26	< Background Well	flat	2	Yes > 10 mg/L Nitrate	1	1.625
317	61.8	No well downgradient	1		37	3	1.75	3	MW-26	< Background Well	flat	2	Yes > 10 mg/L Nitrate	1	1.625
318	129.5	No well downgradient	1		80	1	1.67	3	MW-26	< Background Well	flat	2	Yes > 10 mg/L Nitrate	1	1.375
m318	20	No well downgradient	1		61	1	1.62	3	MW-26	< Background Well	flat	2	Yes > 10 mg/L Nitrate	1	1.375
319	123.6	No well downgradient	1		51	2	1.61	3	MW-26	< Background Well	flat	2	Yes > 10 mg/L Nitrate	1	1.5
m319	14.1	No well downgradient	1		70	1	1.58	3	MW-26	< Background Well	flat	2	Yes > 10 mg/L Nitrate	1	1.375
320	75.7	No well downgradient	1		82	1	1.57	3	MW-26	< Background Well	flat	2	Yes > 10 mg/L Nitrate	1	1.375
m320	12.8	No well downgradient	1		84	1	1.64	3	MW-26	< Background Well	flat	2	Yes > 10 mg/L Nitrate	1	1.375
m321	56	No well downgradient	1		86	1	1.53	3	MW-26	< Background Well	flat	2	Yes > 10 mg/L Nitrate	1	1.375
322	125.8	No well downgradient	1		75	1	1.59	3	MW-26	< Background Well	flat	2	Yes > 10 mg/L Nitrate	1	1.375
m322	20.3	No well downgradient	1		61	1	1.72	3	MW-26	< Background Well	flat	2	Yes > 10 mg/L Nitrate	1	1.375
323	128.5	No well downgradient	1		72	1	1.58	3	MW-26	< Background Well	flat	2	Yes > 10 mg/L Nitrate	1	1.375
324	149	No well downgradient	1		100	1	1.51	3	MW-26	< Background Well	flat	2	Yes > 10 mg/L Nitrate	1	1.375
m324	24	No well downgradient	1		75	1	1.60	3	MW-26	< Background Well	flat	2	Yes > 10 mg/L Nitrate	1	1.375
325	130.8	No well downgradient	1		41	3	1.61	3	MW-26	< Background Well	flat	2	Yes > 10 mg/L Nitrate	1	1.625
326	125.1	No well downgradient	1		21	4	1.58	3	MW-26	< Background Well	flat	2	Yes > 10 mg/L Nitrate	1	1.75
326A	39.3	No well downgradient	1		32	3	1.68	3	MW-26	< Background Well	flat	2	Yes > 10 mg/L Nitrate	1	1.625
326B	22.2	No well downgradient	1		43	3	1.66	3	MW-26	< Background Well	flat	2	Yes > 10 mg/L Nitrate	1	1.625
327	146.3	No well downgradient	1		52	2	1.64	3	MW-25	< Background Well	decreasing	1	Yes > 10 mg/L Nitrate	1	1.375
m327	24.1	No well downgradient	1		54	2	1.86	2	MW-25	< Background Well	decreasing	1	Yes > 10 mg/L Nitrate	1	1.25
328	149.8	No well downgradient	1		61	1	1.64	3	MW-25	< Background Well	decreasing	1	Yes > 10 mg/L Nitrate	1	1.25
329	151.9	No well downgradient	1		81	1	1.52	3	MW-25	< Background Well	decreasing	1	Yes > 10 mg/L Nitrate	1	1.25
329a	25.9	No well downgradient	1		85	1	1.52	3	MW-26	< Background Well	flat	2	Yes > 10 mg/L Nitrate	1	1.375
329b	19.4	No well downgradient	1		77	1	1.58	3	MW-25	< Background Well	decreasing	1	Yes > 10 mg/L Nitrate	1	1.25
329c	24.2	No well downgradient	1		79	1	1.50	4	MW-25	< Background Well	decreasing	1	Yes > 10 mg/L Nitrate	1	1.375
330	64.8	No well downgradient	1		55	2	1.59	3	MW-25	< Background Well	decreasing	1	Yes > 10 mg/L Nitrate	1	1.375
331	81.4	No well downgradient	1		24	4	1.62	3	MW-26	< Background Well	flat				

TABLE 1
Port of Morrow Land Application Program Field Ranking
Winter Irrigation Compliance Plan
Port of Morrow

Updated: 10/10/2023

		<table><tr><th>Risk Level</th><th>Distance to Well</th></tr><tr><td>1 (Low)</td><td>> 5 mi</td></tr><tr><td>2</td><td>4 - 5 mi</td></tr><tr><td>3</td><td>3 - 4 mi</td></tr><tr><td>4</td><td>2 - 3 mi</td></tr><tr><td>5 (High)</td><td>0 - 2 mi</td></tr></table>	Risk Level	Distance to Well	1 (Low)	> 5 mi	2	4 - 5 mi	3	3 - 4 mi	4	2 - 3 mi	5 (High)	0 - 2 mi	<table><tr><th>Risk Level</th><th>Depth to GW</th></tr><tr><td>1 (Low)</td><td>>60</td></tr><tr><td>2</td><td>45-60</td></tr><tr><td>3</td><td>30-45</td></tr><tr><td>4</td><td>15-30</td></tr><tr><td>5 (High)</td><td>0-15</td></tr></table>	Risk Level	Depth to GW	1 (Low)	>60	2	45-60	3	30-45	4	15-30	5 (High)	0-15	<table><tr><th>Risk Level</th><th>Holding Capacity</th></tr><tr><td>1 (Low)</td><td>> 2.25</td></tr><tr><td>2</td><td>1.751 - 2.25</td></tr><tr><td>3</td><td>1.51 - 1.75</td></tr><tr><td>4</td><td>1.251 - 1.5</td></tr><tr><td>5 (High)</td><td><= 1.25</td></tr></table>	Risk Level	Holding Capacity	1 (Low)	> 2.25	2	1.751 - 2.25	3	1.51 - 1.75	4	1.251 - 1.5	5 (High)	<= 1.25			<table><tr><th>Risk Level</th></tr><tr><td>1 - 2 (Low)</td></tr><tr><td>---</td></tr><tr><td>2 - 3.5</td></tr><tr><td>---</td></tr><tr><td>3.5 - 5 (High)</td></tr></table>	Risk Level	1 - 2 (Low)	---	2 - 3.5	---	3.5 - 5 (High)
Risk Level	Distance to Well																																																
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Updated: 10/10/2023		<table><tr><th colspan="2">Downgradient Domestic Wells</th></tr><tr><th>Distance to Domestic Well (closest downgradient domestic well in gw flowpath - miles)</th><th>Risk Level</th></tr></table>	Downgradient Domestic Wells		Distance to Domestic Well (closest downgradient domestic well in gw flowpath - miles)	Risk Level	<table><tr><th colspan="2">Depth to Alluvial Water Table</th></tr><tr><th>Depth to Water (ft bgs - center of circle)</th><th>Risk Level</th></tr></table>	Depth to Alluvial Water Table		Depth to Water (ft bgs - center of circle)	Risk Level	<table><tr><th colspan="2">Soil Water Holding Capacity</th></tr><tr><th>Water Holding Capacity (in water/ft soil)</th><th>Risk Level</th></tr></table>	Soil Water Holding Capacity		Water Holding Capacity (in water/ft soil)	Risk Level	<table><tr><th colspan="4">POM Downgradient Monitoring Wells</th></tr><tr><th>Compliance Well</th><th>Comparison to Background Well</th><th>Current Trend</th><th>Risk Level</th></tr></table>	POM Downgradient Monitoring Wells				Compliance Well	Comparison to Background Well	Current Trend	Risk Level	<table><tr><th colspan="2">Historically Contaminated Alluvial Aquifer</th></tr><tr><th>Historical Contamination (Based on Age of Field)</th><th>Risk Level</th></tr></table>	Historically Contaminated Alluvial Aquifer		Historical Contamination (Based on Age of Field)	Risk Level	<table><tr><th>TOTAL RISK SCORE (Weighted) (max = 5; min = 1)</th></tr></table>	TOTAL RISK SCORE (Weighted) (max = 5; min = 1)																	
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TOTAL RISK SCORE (Weighted) (max = 5; min = 1)																																																	
Farm 5 (Mader-Rust)																																																	
10	158.65	10.3	1	323	1	2.22	2	MW-108	= Background Well	No nitrate in upgradient or downgradient monitoring wells	2	Post-2016 Field	5	1.75																																			
11	167.6	10.4	1	313	1	2.00	2	MW-106	= Background Well		2	Post-2016 Field	5	1.75																																			
12	162.76	9.8	1	308	1	2.07	2	MW-106	= Background Well		2	Post-2016 Field	5	1.75																																			
16	146.2	9.7	1	315	1	2.19	2	MW-108	= Background Well		2	Post-2016 Field	5	1.75																																			
17	170.84	10.0	1	314	1	2.51	1	MW-106	= Background Well		2	Post-2016 Field	5	1.625																																			
18	152.1	9.3	1	307	1	2.26	1	MW-106	= Background Well		2	Post-2016 Field	5	1.625																																			
21	142.5	9.2	1	310	1	2.18	2	MW-108	= Background Well		2	Post-2016 Field	5	1.75																																			
22	164.38	9.4	1	306	1	2.24	2	MW-106	= Background Well		2	Post-2016 Field	5	1.75																																			
23	176.47	8.9	1	305	1	2.25	2	MW-106	= Background Well		2	Post-2016 Field	5	1.75																																			
26	156	8.7	1	311	1	2.14	2	MW-108	= Background Well		2	Post-2016 Field	5	1.75																																			

Notes:

Downgradient well MW-9 - little POM farming occurs upgradient of this monitoring well & the MW is located directly downgradient of the City ponds.

Farm 1 - Circle 152 is a City of Boardman wastewater circle - Port does not use this circle

Port of Morrow 3 East Beach alluvial water supply wells were not considered in this evaluation because the Port controls these wells and continually manages the final nitrate water quality to always be < 10 mg/L.

= depth to GW from center of field was not GIS derived; estimated based on google earth data and gw contours and adjacent field values.

= these cells have been updated from the May 2023 table, and reflect the updated groundwater contours developed using the expanded groundwater monitoring network.

= these cells have been updated from the May 2023 table to reflect more recent groundwater quality results.

Soil moisture holding capacity are derived from field capacity minus wilting point. Field capacity is derived from soil moisture datasets for each field by IRZ. No field moisture measurements are available for Field 149, so the SWHC was calculated from the NRCS estimate field capacity based on the soil type.

Farm 2 –Circle 213, although its risk score is 3.5, is designated as High Risk because all other Farm 2 circles are High Risk.

TABLE 2
Port of Morrow Land Application Program - Field Ranking Risk Scoring Approach
Winter Irrigation Compliance Plan
Port of Morrow

Risk Levels 1=Low, 2=Low-Medium, 3=Medium, 4=Medium-High, 5=High Risk

Closer to a domestic wells equates to higher risk

Downgradient Domestic Wells	
Risk Level	Distance to Well <i>(closest downgradient domestic well in gw flowpath - miles)</i>
1 <i>(Low)</i>	> 5 mi
2	4 - 5 mi
3	3 - 4 mi
4	2 - 3 mi
5 <i>(High)</i>	0 - 2 mi

Shallower depth to water table equates to higher risk

Depth to Alluvial Water Table	
Risk Level	Depth to GW <i>(ft bgs - circle center)</i>
1 <i>(Low)</i>	>60
2	45-60
3	30-45
4	15-30
5 <i>(High)</i>	0-15

Lower soil moisture holding capacity equates to higher risk

Soil Water Holding Capacity	
Risk Level	Holding Capacity <i>(in water/ft soil)</i>
1 <i>(Low)</i>	> 2.25
2	1.751 - 2.25
3	1.51 - 1.75
4	1.251 - 1.5
5 <i>(High)</i>	< = 1.25

POM Downgradient Monitoring Wells

- 1) Evaluating 2 different categories of information; Weighting the results to become one variable in final risk table
2) Weighting the results to become one variable in final risk table

Comparison of Compliance Well to the Background/Upgradient Well

greater than (>) Background/Upgradient Well = 5
GW conc prior to Port > 20 mg/L = 3
Less than (<) Background/Upgradient Well = 1

Compliance Well - Nitrate Trend

Increasing = 5
Flat = 3
Decreasing = 1

Risk Level	Total Risk Score <i>(weighted evenly for each category)</i>
1 <i>(Low)</i>	1
2	2
3	3
4	4
5 <i>(High)</i>	5

Each Category is weighted 50% of the total risk score

	Comparison to Background Well	Current Trend	Comparison Risk Score	Trend Risk Score	Total Risk Score <i>(weighted evenly for each category)</i>
Farm 1 & 3					
MW-11, 5D	> Background Well	flat/decreasing	5	3	4
MW-24	< Background Well	increasing	1	5	3
MW-25	< Background Well	decreasing	1	1	1
MW-26	< Background Well	flat	1	3	2

Note: Farm 1& 3 based on statistical evaluation of data thru 2022, with trends from 2017 - 2022 dataset (post corrective actions plan)

Farm 2					
MW-12s	> Background Well	~ flat	5	3	4
MW-13c	> Background Well	increasing	5	5	5
MW-14s	< Background Well	~ flat	3	1	2

Note: Farm 2 results were based on professional judgement, with trends estimated from 2017 - 2022 dataset (post corrective actions plan)

Farm 4					
MW-101/105	< Background Well	increasing	1	5	3
MW MR3/105	< Background Well	increasing	1	5	3
MW-101/108	> Background Well	Increasing	5	5	5
MW-102	Pre Port > 20 mg/L	~ flat	3	3	3
MW-103	Pre Port > 20 mg/L	increasing	3	5	4
Farm 5					
MW-106	≈ Background Well	~ flat	1	3	2
MW-108	≈ Background Well	~ flat	1	3	2

New compliance well

Farm 5 downgradient wells
Farm 5 downgradient wells

Little to no historic groundwater contamination is given higher score

Historically Contaminated Aquifer		
Risk Level	Historic Contamination	Field Development Date
1 <i>(Low)</i>	Historic Contamination > 10 mg/L Nitrate	Field present prior to 2013
2	---	---
3	Historic Contamination 2 - 10 mg/L Nitrate	Field present between 2013 and Aug 2016
4	---	---
5 <i>(High)</i>	No Contamination	Field developed since 2016

Farm 1, 2, & 3, and Farm 4 Circles present prior to 20

Farm 4 Circles developed between 2013 and 8/2016

All other Farm 4 Circles, and Farm 5 Circles

In the absence of groundwater data (Farms 4 and 5) the development date is used to evaluate historic groundwater contamination

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FIGURE 1
Irrigation Field Risk Summary,
Farms 1, 2, and 3
(Weighted)
Port of Morrow
Land Application Farms

LEGEND

POM Farm

Irrigation Circle

All Other Features

County Boundary

City Boundary

Major Road

Risk Score, Weighted

Low

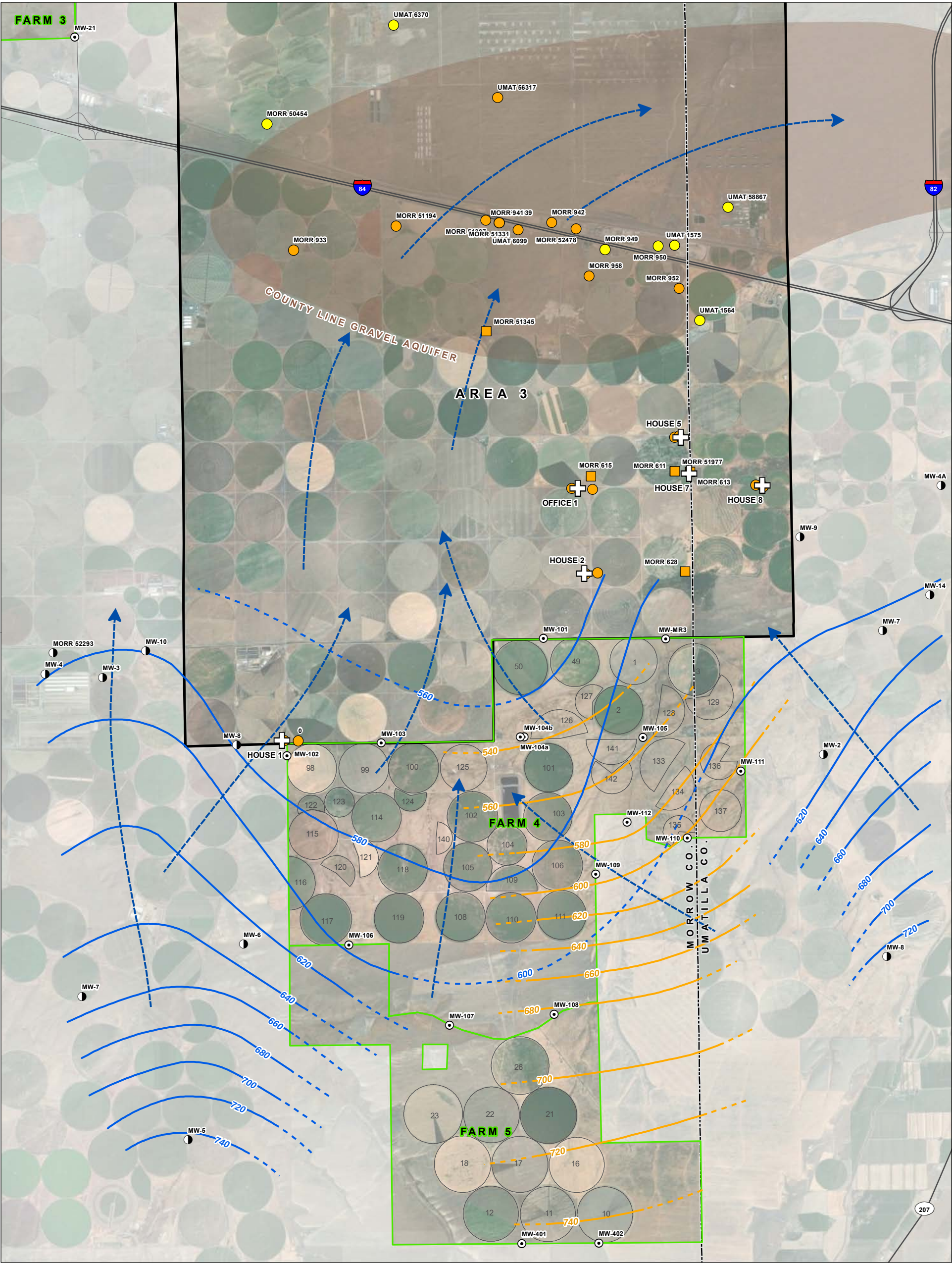
Medium

High

0 1,500 3,000 4,500
Feet

Date: October 26, 2023
Data Sources: BLM, ESRI, ODOT, USGS,
Aerial Photo 2020





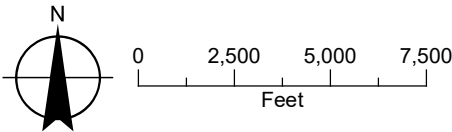
LEGEND

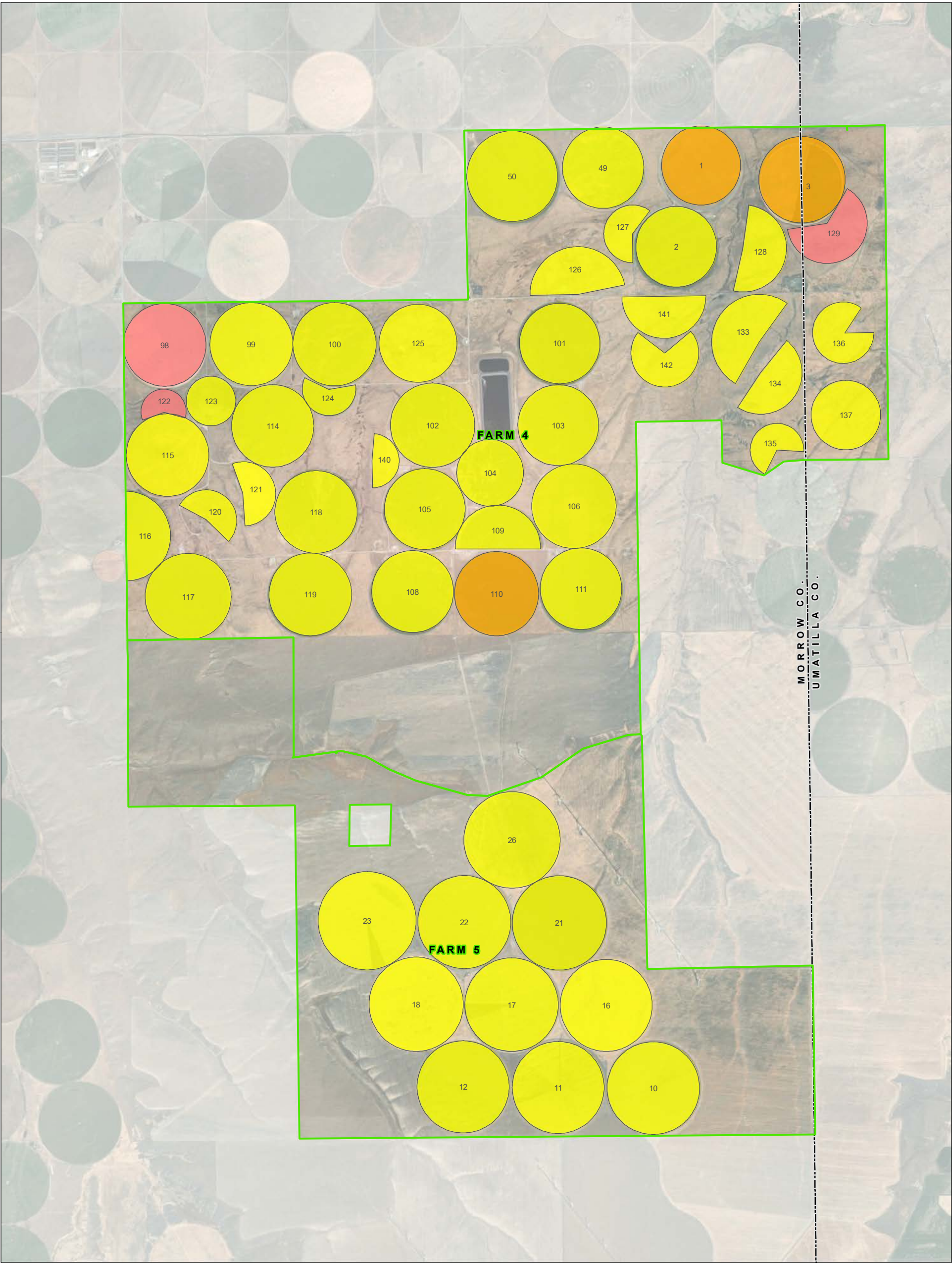
- Possible House/Office
- Unconfined Aquifer Groundwater Contour, Dashed where Inferred From 2023 RI/FS Report
- Confined Aquifer Groundwater Contour, Dashed where Inferred From 2023 RI/FS Report
- Groundwater Flow
- POM Farm
- County Line Gravel Aquifer
- Irrigation Circle
- Well Search Area
- Well Type**
 - Domestic
 - Irrigation
 - Monitoring Well - Apart of POM Network
 - Monitoring Well - Not apart of POM Network

- Irrigation Circle**
 - Alluvial
 - Unknown
- All Other Features**
 - County Boundary
 - Major Road

FIGURE 2
Groundwater Flow Direction
Farm 4 and Farm 5 Domestic Alluvial Wells Only
Port of Morrow Land Application Farms and Downgradient Groundwater Flow Areas

Date: October 9, 2023
Data Sources: BLM, ESRI, ODOT, USGS, Aerial Photo 2020





LEGEND

- POM Farm
- Irrigation Circle

All Other Features

- County Boundary
- City Boundary
- Major Road

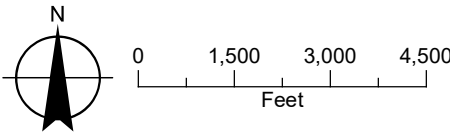
Risk Score, Weighted

- Low
- Medium
- High

FIGURE 3

Irrigation Field Risk Summary, Farms 4 and 5
(Weighted)

Port of Morrow Land Application Farms





Oregon

Kate Brown, Governor

Department of Environmental Quality
Office of Compliance and Enforcement
700 NE Multnomah Street, Suite 600
Portland, OR 97232-4100
(503) 229-5696
FAX (503) 229-5100
TTY 711

April 4, 2024

CERTIFIED MAIL NO. 9859 0710 5270 0688 6529 87

Port of Morrow
c/o Lisa Mittelsdorf, Executive Director
P.O. Box 200
Boardman, OR 97818

Re: Final Order and Stipulated Penalty Demand Notice
Case No. WQ/I-ER-2023-162

This letter is to inform you that the Oregon Department of Environmental Quality (DEQ) has issued you a Final Order and Stipulated Penalty Demand Notice (Order) in the amount of \$727,050 for violations of your Water Pollution Control Facilities permit.

As described in the Mutual Agreement and Final Order (MAO) you signed with DEQ on October 31, 2023, upon receipt of a written notice from DEQ for any violations of Schedule A, Conditions 7, 11 and 13(A)(ii) and (iii) of your wastewater permit you are required to pay stipulated penalties as prescribed in the MAO. This letter and the attached Order serve as notice you violated the permit's limits on land application of wastewater during the November 2023 through February 2024 non-growing season. These limits are intended to prevent overapplication of nitrogen that could cause groundwater contamination.

The MAO includes higher stipulated penalties for applying wastewater in excess of permit limits to fields near drinking water supplies (high-risk fields). There were no violations at high-risk farm fields during the November 2023 to February 2024 time period, 3% percent of the violations occurred in medium-risk fields and 97% percent at low-risk fields. The attached Order also cites five violations of the permit condition prohibiting wastewater effluent spills to the ground surface in areas not authorized for land application. The penalty for all violations cited in the Order is \$727,050 and is now due.

These violations occurred because you do not currently have the necessary wastewater treatment systems to operate in compliance with the permit. As of the date of this Order, you are on track with the MAO schedule to complete construction these systems by November 2025.

Please be advised that further violations of the permit or MAO are subject to additional civil penalties.

The MAO allows you to direct up to 80% of this \$727,050 penalty to the Oregon Health Authority Supplemental Environmental Project (SEP) incorporated into the MAO or to another DEQ-approved SEP. DEQ strongly encourages the use of these additional funds to help support projects that mitigate the harm from nitrate contamination of groundwater in the Lower Umatilla Basin Groundwater

Management Area. If you propose a new SEP, DEQ encourages you to conduct a public process to solicit community input into the identification and selection of a SEP project, consistent with DEQ's recently updated SEP policy.¹ DEQ can assist you in conducting such a public process.

Your right to appeal the Order is outlined in the enclosed document as well as in the MAO.

If you have any questions about the Order, please contact Jeff Bachman in DEQ's Office of Compliance and Enforcement at 503-229-5950. Questions about compliance with the permit and MAO should be directed to Justin Sterger at DEQ's at 541-633-2016.

Sincerely,



Becka Puskas, Interim Manager
Office of Compliance and Enforcement
Enclosure

cc: Michael Campbell, Attorney for Port of Morrow, Steel Rives LLP, 760 SW Ninth Avenue, Suite 3000, Portland, OR 97205
Justin Sterger, DEQ
Mike Hiatt, DEQ
Accounting, DEQ

¹ DEQ's SEP policy is available at <https://www.oregon.gov/deq/FilterDocs/imdSEPappG.pdf>

BEFORE THE ENVIRONMENTAL QUALITY COMMISSION

OF THE STATE OF OREGON

IN THE MATTER OF:) FINAL ORDER AND STIPULATED
PORT OF MORROW,) PENALTY DEMAND NOTICE
)
) CASE NO. WQ/I-ER-2023-162
Respondent.)

I. FINDINGS OF FACT AND CONCLUSIONS

1. On October 31, 2023, Respondent and the Department of Environmental Quality (Department) entered into Mutual Agreement and Order (MAO) No. WQ/I-ER-2021-106.

2. Paragraph 21 of the MAO states: "For violations of the soil nitrate and soil moisture requirements established in Schedule A, Conditions 13(A)(ii), (iii), and (iv) or the leaching prohibition in Schedule A, Condition 11 of the Permit during the non-growing seasons of 2023-2024 and 2024-2025, upon receipt of a written Penalty Demand Notice from DEQ, Respondent shall pay a civil penalty of:

a. \$750 for each violation occurring at an application site identified as low risk in Appendix A of the attached Compliance Plan,

b. \$3,750 for each violation occurring at an application site identified as medium risk in Appendix A of the attached Compliance Plan, and

c. \$7,500 for each violation occurring at an application site identified as high risk in Appendix A of the attached Compliance Plan."

3. Respondent violated the Permit referenced in the MAO as follows:

Site	Schedule A Permit Condition Violated	Site Risk Level	Dates of Violation	Number of Violations
Farm 3, Field 316	Condition 13(A)(ii)	Low	November 8-13, 2023	6
Farm 3, Field m319	Condition 13(A)(ii)	Low	November 8, 11-13, 2023	4
Farm 3, Field 330	Condition 13(A)(ii)	Low	November 10-11, 2023	2

1	Farm 3, Field 333b	Condition 13(A)(ii)	Low	November 21-22, 2023	2
2	Farm 3, Field m334	Condition 13(A)(ii)	Low	November 17-19, 2023	3
3	Farm 3, Field 312	Condition 13(A)(iii)	Low	November 7 and 11, 2023	2
4	Field 3, Farm 314	Condition 13(A)(iii)	Low	November 19, 2023	1
5	Farm 3, Field 317	Condition 13(A)(ii)	Low	November 2, 2023	1
6	Farm 3, Field 318	Condition 13(A)(iii)	Low	November 7, 11 and 19, 2023	3
7	Farm 3, Field m322	Condition 13(A)(ii)	Low	November 7 and 11, 2023	2
8	Farm 3, Field m322	Condition 13(A)(iii)	Low	November 7 and 11, 2023	2
9	Farm 3, Field 324	Condition 13(A)(iii)	Low	November 19, 2023	1
10	Farm 3, Field 326	Condition 13(A)(ii)	Low	November 19, 2023	1
11	Farm 3, Field 326	Condition 13(A)(iii)	Low	November 19, 2023	1
12	Farm 3, Field 326A	Condition 13(A)(iii)	Low	November 1-2 and 4-5, 2023	4
13	Farm 3, Field 326A	Condition 11	Low	November 1-2 and 4-5, 2023	4
14	Farm 3, Field 329	Condition 13(A)(ii)	Low	November 1-5, 2023	5
15	Farm 3, Field 329	Condition 13(A)(iii)	Low	November 1-5, 2023	5
16	Farm 3, Field 329(a)	Condition 13(A)(ii)	Low	November 7 and 11, 2023	2
17	Farm 3, Field 329(b)	Condition 13(A)(ii)	Low	November 2-3, 2023	2
18	Farm 3, Field 329(b)	Condition 13(A)(iii)	Low	November 2-3, 2023	2

1	Farm 3, Field 329(c)	Condition 13(A)(ii)	Low	November 7, 2023	1
2	Farm 3, Field 329(c)	Condition 13(A)(iii)	Low	November 7, 2023	1
3	Farm 3, Field 330	Condition 13(A)(ii)	Low	November 7, 2023	1
4	Farm 3, Field 333A	Condition 13(A)(ii)	Low	November 7, 2023	1
5	Farm 3, Field 333A	Condition 13(A)(iii)	Low	November 7 and 11, 2023	2
6	Farm 3, Field 334	Condition 13(A)(ii)	Low	November 1-2, 2023	2
7	Farm 3, Field 334	Condition 13(A)(iii)	Low	November 1-2, 2023	2
8	Farm 3, Field 333c	Condition 11	Low	November 14, 2023	1
9	Farm 3, Field 336	Condition 13(A)(iii)	Low	November 1-2, 2023	2
10	Farm 3, Field 338	Condition 13(A)(iii)	Low	November 7, 2023	1
11	Farm 3, Field 340	Condition 13(A)(ii)	Low	November 7 and 11, 2023	2
12	Farm 3, Field 340	Condition 13(A)(iii)	Low	November 7 and 11, 2023	2
13	Farm 3, Field 340	Condition 11	Low	November 7, 2023	1
14	Farm 3, Field m340	Condition 13(A)(iii)	Low	November 7, 2023	1
15	Farm 1, Field 138	Condition 13(A)(iii)	Low	December 27-29, 2023	3
16	Farm 1, Field 17	Condition 13(A)(ii)	Low	December 28-29, 2023	2
17	Farm 3, Field 312	Condition 13(A)(iii)	Low	December 21-22, 2023	2
18	Farm 3, Field 314	Condition 13(A)(iii)	Low	December 21-22, 2023	2

1	Farm 3, Field 316	Condition 13(A)(ii)	Low	December 19-21 and 29-30, 2023	5
2	Farm 3, Field 316	Condition 13(A)(iii)	Low	December 19-21 and 29-30, 2023	5
3	Farm 3, Field m316	Condition 13(A)(iii)	Low	December 21-22, 2023	2
4	Farm 3, Field 319	Condition 13(A)(iii)	Low	December 21-22, 26-27 and 29-31, 2023	7
5	Farm 3 Field m319	Condition 13(A)(ii)	Low	December 8-11 and 26-31, 2023	10
6	Farm 3 Field m319	Condition 13(A)(iii)	Low	December 26-31, 2023	6
7	Farm 3, Field m321	Condition 13(A)(iii)	Low	December 11, 2023	1
8	Farm 3, Field 323	Condition 13(A)(iii)	Low	December 21-22 and 29-30, 2023	4
9	Farm 3, Field 324	Condition 13(A)(iii)	Low	December 21-22, 2023	2
10	Farm 3, Field 325	Condition 13(A)(iii)	Low	December 27-28, 2023	2
11	Farm 3, Field 327	Condition 13(A)(iii)	Low	December 7-10, 2023	4
12	Farm 3, Field m327	Condition 13(A)(ii)	Low	December 7-8, 2023	2
13	Farm 3, Field 329	Condition 13(A)(ii)	Low	December 27-28, 2023	2
14	Farm 3, Field 329a	Condition 13(A)(ii)	Low	December 8-9, 11, 27-28 and 30-31, 2023	7
15	Farm 3, Field 329a	Condition 13(A)(iii)	Low	December 27-28, 2023	2
16	Farm 3, Field 329b	Condition 13(A)(ii)	Low	December 8-9, 27-28 and 30-31, 2023	6
17	Farm 3, Field 329b	Condition 13(A)(iii)	Low	December 8-9, 27-28 and 30-31, 2023	6
18	Farm 3, Field 329c	Condition 13(A)(ii)	Low	December 7 and 9-10, 2023	3

1	Farm 3, Field 330	Condition 13(A)(ii)	Low	December 8-9, 2023	2
2	Farm 3, Field 330	Condition 13(A)(iii)	Low	December 8-9, 2023	2
3	Farm 3, Field 332	Condition 13(A)(iii)	Low	December 8-9 and 27-28, 2023	4
4	Farm 3, Field 333	Condition 13(A)(iii)	Low	December 8-11, 26-27 and 29-30, 2023.	8
5	Farm 3, Field 333A	Condition 13(A)(ii)	Low	December 7, 9 and 11, 2023	3
6	Farm 3, Field 333A	Condition 13(A)(iii)	Low	December 7, 9 and 11, 2023	3
7	Field 3, Field m334	Condition 13(A)(ii)	Low	December 8-9 and 11, 2023	3
8	Farm 3, Field 338	Condition 13(A)(iii)	Low	December 27-28, 2023	2
9	Farm 3, Field 353	Condition 13(A)(iii)	Low	December 26-28, 2023	3
10	Farm 3, Field m353	Condition 13(A)(ii)	Low	December 8-10, 26-27 and 29-30, 2023	7
11	Farm 3, Field m353	Condition 13(A)(iii)	Low	December 8-10, 26-27 and 29-30, 2023	7
12	Farm 3, Field m354	Condition 13(A)(iii)	Low	December 26, 2023.	1
13	Farm 4, Field 49	Condition 13(A)(iii)	Low	December 8-14, 2023	7
14	Farm 4, Field 99	Condition 13(A)(iii)	Low	December 26-28, 2023	3
15	Farm 4, Field 100	Condition 13(A)(iii)	Low	December 20-23, 2023	4
16	Farm 4, Field 108	Condition 13(A)(iii)	Low	December 13-19, 2023	7
17	Farm 4, Field 110	Condition 13(A)(iii)	Medium	December 13-23, 2023	11
18	Farm 4, Field 114	Condition 13(A)(iii)	Low	December 8-10 and 28-30, 2023	6

1	Farm 4, Field 115	Condition 13(A)(ii)	Low	December 11-23, 2023	13
2	Farm 4, Field 115	Condition 13(A)(iii)	Low	December 16-23, 2023	8
3	Farm 4, Field 116	Condition 13(A)(iii)	Low	December 8-14, 2023	7
4	Farm 4, Field 117	Condition 13(A)(iii)	Low	December 13-14 and 26-27, 2023	4
5	Farm 1, Field 138	Condition 13(A)(iii)	Low	January 3-5, 2024	3
6	Farm 1, Field 145	Condition 13(A)(iii)	Low	January 6-7 and 9-10, 2024	4
7	Farm 1, Field 147	Condition 13(A)(ii)	Low	January 3-4, 2024	2
8	Farm 1, Field 148	Condition 13(A)(iii)	Low	January 10-11, 2024	2
9	Farm 1, Field 149	Condition 13(A)(ii)	Low	January 4-5, 2024	2
10	Farm 1, Field 149	Condition 13(A)(iii)	Low	January 4-5, 2024	2
11	Farm 3, Field 312	Condition 13(A)(iii)	Low	January 1, 3-4 and 9-10, 2024	5
12	Farm 3, Field 315	Condition 13(A)(iii)	Low	January 9-10, 2024	2
13	Farm 3, Field 316	Condition 13(A)(ii)	Low	January 3-5 and 9-10, 2024	5
14	Farm 3, Field 316	Condition 13(A)(iii)	Low	January 3-5 and 9-10, 2024	5
15	Farm 3, Field m316	Condition 13(A)((iii)	Low	January 3, 2024	1
16	Farm 3, Field m318	Condition 13(A)(iii)	Low	January 3-4 and 9-10, 2024	4
17	Farm 3, Field 319	Condition 13(A)(iii)	Low	January 3 and 5, 2024	2
18	Farm 3, Field m319	Condition 13(A)(ii)	Low	January 3-5, 2024	3

1	Farm 3, Field m319	Condition 13(A)(iii)	Low	January 3-5, 2024	3
2	Farm 3, Field 320	Condition 13(A)(iii)	Low	January 3-4, 2024	2
3	Farm 3, Field m320	Condition 13(A)(iii)	Low	January 3-4, 2024	2
4	Farm 3, Field m321	Condition 13(A)(iii)	Low	January 3-4, 2024	2
5	Farm 3, Field 323	Condition 13(A)(iii)	Low	January 4-5, 2024	2
6	Farm 3, Field 325	Condition 13(A)(iii)	Low	January 2-3 and 9-10, 2024	4
7	Farm 3, Field 329	Condition 13(A)(ii)	Low	January 2-3, 2024	2
8	Farm 3, Field 332	Condition 13(A)(iii)	Low	January 2-3, 2024	2
9	Farm 3, Field 338	Condition 13(A)(iii)	Low	January 2-3, 2024	2
10	Farm 3, Field 353	Condition 13(A)(iii)	Low	January 9-11, 2024	3
11	Farm 4, Field 1	Condition 13(A)(ii)	Medium	January 9-11, 2024	3
12	Farm 4, Field 50	Condition 13(A)(ii)	Low	January 9-11, 2024	3
13	Farm 4, Field 99	Condition 13(A)(ii)	Low	January 3-4 and 6-10, 2024	7
14	Farm 4, Field 99	Condition 13(A)(iii)	Low	January 6-10, 2024	5
15	Farm 4, Field 100	Condition 13(A)(iii)	Low	January 2-3 and 6-11, 2024	8
16	Farm 4, Field 108	Condition 13(A)(iii)	Low	January 4-11, 2024	8
17	Farm 4, Field 110	Condition 13(A)(iii)	Medium	January 4-11, 2024	8
18	Farm 4, Field 115	Condition 13(A)(ii)	Low	January 2-4, 2024	3

1	Farm 4, Field 115	Condition 13(A)(iii)	Low	January 2-4, 2024	3
2	Farm 4, Field 117	Condition 13(A)(iii)	Low	January 6-11, 2024	6
3	Farm 1, Field 138	Condition 13(A)(iii)	Low	February 11-13, 18-19 and 27-29, 2024	9
4	Farm 1, Field 139	Condition 13(A)(iii)	Low	February 7-10 and 16-17, 2024	6
5	Farm 1, Field 145	Condition 13(A)(iii)	Low	February 8-11 and 17-18, 2024	6
6	Farm 1, Field 147	Condition 13(A)(ii)	Low	February 5-7, 10-11, 16-17, 2024	7
7	Farm 1, Field 148	Condition 13(A)(iii)	Low	February 7-10 and 15-16, 2024	6
8	Farm 1, Field 150	Condition 13(A)(iii)	Low	February 15-16, 2024	2
9	Farm 3, Field 312	Condition 13(A)(iii)	Low	February 9-10, 15-16, 21-22, and 28-29, 2024	8
10	Farm 3, Field 314	Condition 13(A)(iii)	Low	February 13-14, 2024	2
11	Farm 3, Field 315	Condition 13(A)(iii)	Low	February 7-8, 2024	2
12	Farm 3, Field 316	Condition 13(A)(ii)	Low	February 5, 9-10, 15-16, 21-22 and 29, 2024	8
13	Farm 3, Field 316	Condition 13(A)(iii)	Low	February 5, 9-10, 15-16, 21-22 and 29, 2024	8
14	Farm 3, Field m316	Condition 13(A)(iii)	Low	February 9-10 and 15, 2024	3
15	Farm 3, Field 317	Condition 13(A)(ii)	Low	February 10, 12-15 and 26, 2024	6
16	Farm 3, Field 318	Condition 13(A)(iii)	Low	February 5-8 and 12-13, 2024	6
17	Farm 3, Field m318	Condition 13(A)(iii)	Low	February 5-6 and 26, 2024	3
18	Farm 3, Field 319	Condition 13(A)(iii)	Low	February 10-11, 2024	2

1	Farm 3, Field m319	Condition 13(A)(ii)	Low	February 12, 18-19, and 24-26, 2024	6
2	Farm 3, Field m319	Condition 13(A)(iii)	Low	February 12, 18-19, and 24-26, 2024	6
3	Farm 3, Field m320	Condition 13(A)(iii)	Low	February 6-10, 16-17, 21-22, and 29, 2024	10
4	Farm 3, Field m321	Condition 13(A)(iii)	Low	February 12-13, 15-16 and 22-23, 2024	6
5	Farm 3, Field m322	Condition 13(A)(ii)	Low	February 13, 19-20, and 23-24, 2024	5
6	Farm 3, Field m322	Condition 13(A)(iii)	Low	February 13, 19-20, and 23-24, 2024	5
7	Farm 3, Field 324	Condition 13(A)(iii)	Low	February 12-13, 15-16 and 22-23, 2024	6
8	Farm 3, Field 326A	Condition 13(A)(iii)	Low	February 26, 2024	1
9	Farm 3, Field 326B	Condition 13(A)(iii)	Low	February 5-7, 9-10, and 15, 2024.	6
10	Farm 3, Field 329	Condition 13(A)(ii)	Low	February 26, 2024	1
11	Farm 3, Field 329	Condition 13(A)(iii)	Low	February 26, 2024	1
12	Farm 3, Field 329a	Condition 13(A)(ii)	Low	February 5-8, 13-14, 16-17 and 22-23, 2024	10
13	Farm 3, Field 329a	Condition 13(A)(iii)	Low	February 5-8, 13-14, 16-17 and 22-23, 2024	10
14	Farm 3, Field 329b	Condition 13(A)(ii)	Low	February 13-14, 16-17, and 26-27, 2024	6
15	Farm 3, Field 329b	Condition 13(A)(iii)	Low	February 13-14, 16-17, and 26-27, 2024	6
16	Farm 3, Field 329c	Condition 13(A)(ii)	Low	February 8-9, 13-14, 17-18 and 26-27, 2024	8
17	Farm 3, Field 329c	Condition 13(A)(iii)	Low	February 8-9, 13-14, 17-18 and 26-27, 2024	8
18	Farm 3, Field 331	Condition 13(A)(iii)	Low	February 12-13, 20-21, and 26-27, 2024.	6

1	Farm 3, Field 332	Condition 13(A)(iii)	Low	February 6-7, 9-10, 13-14 and 18-19, 2024	8
2	Farm 3, Field 333A	Condition 13(A)(ii)	Low	February 6-7, 13-14 and 20-21, 2024	6
3	Farm 3, Field 333A	Condition 13(A)(iii)	Low	February 6-7, 13-14 and 20-21, 2024	6
4	Farm 3, Field m334	Condition 13(A)(ii)	Low	February 13-14 and 19-20, 2024	4
5	Farm 3, Field 338	Condition 13(A)(iii)	Low	February 8-9 and 13-14, 2024	4
6	Farm 3, Field m340	Condition 13(A)(iii)	Low	February 13-14, 19-20 and 27-28, 2024	6
7	Farm 3, Field 353	Condition 13(A)(iii)	Low	February 5-12, 16-18, and 24-26, 2024	14
8	Farm 3, Field m353	Condition 13(A)(ii)	Low	February 13-15 and 18-19, 2024	5
9	Farm 3, Field m353	Condition 13(A)(iii)	Low	February 13-15 and 18-19, 2024	5
10	Farm 3, Field m354	Condition 13(A)(iii)	Low	February 5-6, 9-10, 19-20, 22-23, and 29, 2024	9
11	Farm 3, Field 355	Condition 13(A)(iii)	Low	February 10-12, 19-21, 23-24, 2024	8
12	Farm 4, Field 2	Condition 13(A)(ii)	Low	February 9-15, 19-22 and 26-28, 2024	14
13	Farm 4, Field 2	Condition 13(A)(iii)	Low	February 9-15, 19-22 and 26-28, 2024	14
14	Farm 4, Field 49	Condition 13(A)(iii)	Low	February 12-13, 2024	2
15	Farm 4, Field 50	Condition 13(A)(ii)	Low	February 8-12 and 15-19, 2024	10
16	Farm 4, Field 50	Condition 13(A)(iii)	Low	February 8-12 and 15-19, 2024	10
17	Farm 4, Field 50	Condition 11	Low	February 10-12 and 15-19, 2024	8
18	Farm 4, Field 99	Condition 13(A)(ii)	Low	February 12-15, 22-24 and 27-28, 2024	10

1	Farm 4, Field 99	Condition 13(A)(iii)	Low	February 12-15, 22-24 and 27-28, 2024	10
2	Farm 4, Field 100	Condition 13(A)(iii)	Low	February 8-12, 15-22 and 24-26, 2024	16
3	Farm 4, Field 108	Condition 13(A)(iii)	Low	February 5-8 and 16-19, 2024	8
4	Farm 4, Field 109	Condition 13(A)(iii)	Low	February 8-12 and 19-22, 2024	9
5	Farm 4, Field 115	Condition 13(A)(ii)	Low	February 5-8, 16-22 and 24-25, 2024	13
6	Farm 4, Field 115	Condition 13(A)(iii)	Low	February 5-8, 16-22 and 24-25, 2024	13
7	Farm 4, Field 116	Condition 13(A)(iii)	Low	February 8-12 and 22-24, 2024	8
8	Farm 4, Field 117	Condition 13(A)(iii)	Low	February 24-28, 2024	5
9	Farm 4, Field 118	Condition 13(A)(iii)	Low	February 7-8, 12-16 and 22-25, 2024	11
10	Farm 4, Field 123	Condition 13(A)(ii)	Low	February 29, 2024	1
11	Farm 4, Field 140	Condition 13(A)(iii)	Low	February 29, 2024	1
12	Farm 5, Field 12	Condition 13(A)(ii)	Low	February 19-23, 2024	5
13	Farm 5, Field 16	Condition 13(A)(ii)	Low	February 12-14 and 18, 2024	4
14	Farm 5, Field 16	Condition 13(A)(iii)	Low	February 12-14 and 18, 2024	4
15	Farm 5, Field 18	Condition 13(A)(ii)	Low	February 14-18 and 25-27, 2024	8
16	Farm 5, Field 18	Condition 13(A)(iii)	Low	February 25-27, 2024	3
17	Farm 5, Field 22	Condition 13(A)(iii)	Low	February 14-18, 25-27 and 29, 2024	9
18	Farm 5, Field 26	Condition 13(A)(ii)	Low	February 12-14, 18-20 and 27-29, 2024	9

Farm 5, Field 26	Condition 13(A)(iii)	Low	February 12-14, 18-20 and 27-29, 2024	9
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4. Paragraph 22 of the MAO states: "For violations of Schedule A, Condition 7 of the Permit resulting from the discharge of wastewater from Respondent's pipelines to the ground surface occurring from the effective date of this MAO until November 1, 2025, upon receipt of a written Penalty Demand Notice from DEQ, Respondent shall pay a civil penalty of

a. \$0 for discharges of less than 400 gallons where Respondent has promptly notified DEQ and cleaned up the discharge.

b. \$600 for discharges under 5,000 gallons.

c. \$1,200 for discharges of 5,000 gallons or more but less than 50,000 gallons.

d. \$2,400 for discharges of 50,000 gallons or more."

5. Respondent violated Schedule A, Condition 7 of the Permit as follows:

a. On March 13, 2024, Respondent discharged 3,000 gallons of wastewater to ground surface at Circle 329 approximately 3,500 feet north of the intersection of Lewis & Clark Drive and US Highway 730, Boardman, Oregon.

b. On March 10, 2024, Respondent discharged 20,000 gallons of wastewater to ground surface at Circle 144 approximately 1,800 feet east of the intersection of Columbia Boulevard and Gar Swanson Drive, Boardman, Oregon.

c. On March 9, 2024, Respondent discharged 2,500 gallons of wastewater to ground surface at Circle 146 approximately 100 feet south of Lewis & Clark Drive, Boardman, Oregon.

d. On February 12, 2024, Respondent discharged 20,000 gallons of wastewater to ground surface at Circle 147 approximately 2,000 feet northeast of the intersection of Columbia Boulevard and Lewis and Clark Drive, Boardman, Oregon.

e. On January 16, 2024, Respondent discharged 30,000 gallons of wastewater to ground surface at Circle 140 approximately 3,300 feet northeast of Gar Swanson and Columbia Boulevard, Boardman, Oregon.

6. The penalty for Respondent's violations cited in Paragraph 3, above, is \$722,250.

7. The penalty for Respondent's violations cited in Paragraph 4, above is \$4,800.

8. Respondent's total civil penalty is \$727,050.

II. ORDER TO PAY CIVIL PENALTY

Based upon the foregoing FINDINGS OF FACTS and CONCLUSIONS, Respondent is hereby ORDERED TO: Pay a total civil penalty of \$727,050.

If you do not file a request for hearing as set forth in Section III below, your check or money order must be made payable to "State Treasurer, State of Oregon" and sent to the DEQ, Business Office, 700 NE Multnomah Street, Suite #600, Portland, Oregon 97232.

III. NOTICE OF RIGHT TO REQUEST A CONTESTED CASE HEARING

You have a right to a contested case hearing on this Order and Demand for Payment of Stipulated Penalty. **As described in paragraph 23 of the MAO, the issue shall be limited to Respondent's compliance or non-compliance with the MAO.** DEQ must receive the written request for hearing **within 20 calendar days** from the date you receive this Final Order and Stipulated Penalty Demand Notice. If you have any affirmative defenses or wish to dispute any allegations of fact in this Order, you must do so in your request for hearing, as factual matters not denied will be considered admitted, and failure to raise a defense will be a waiver of the defense. (See OAR 340-011-0530 for further information about requests for hearing.) You must send your request to: **DEQ, Office of Compliance and Enforcement, 700 NE Multnomah Street, Suite 600, Portland, Oregon 97232**, fax it to **503-229-5100** or email it to **DEQappeals@deg.state.or.us**. An administrative law judge employed by the Office of Administrative Hearings will conduct the hearing, according to ORS Chapter 183, OAR Chapter 340, Division 011 and OAR 137-003-0501 to 0700. You have a right to be represented by an attorney at the hearing, however you are not required to be. If you are an individual, you may represent yourself. If you are a corporation, partnership, limited liability company, unincorporated association, trust or government body, you must be represented by an attorney or a duly authorized representative, as set forth in OAR 137-003-0555.

1 Active duty Service members have a right to stay proceedings under the federal Service
2 Members Civil Relief Act. For more information contact the Oregon State Bar at 1-800-
3 452-8260, the Oregon Military Department at 503-584-3571, or the nearest United States Armed
4 Forces Legal Assistance Office through <http://legalassistance.law.af.mil>. The Oregon Military
5 Department does not have a toll free telephone number.

6 If you fail to file a request for hearing in writing within 20 calendar days of receipt of this
7 Order, the Order will become a final order by default without further action by DEQ as per OAR
8 340-011-0535(5). DEQ designates the relevant portions of its files, including information
9 submitted by you, as the record for purposes of proving a prima facie case.

10
11
12 4/4/2024
13 Date

14 Becka J Puskas
15 Becka Puskas, Interim Manager
16 Office of Compliance and Enforcement
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August 12, 2024

Justin W. Sterger
Senior Permit Writer, WQ Program

Department of Environmental Quality (DEQ)
Eastern Region Bend Office
475 NE Bellevue Drive, Suite 110
Bend, OR 97701

Subject: Port of Morrow's Request to Modify WPCF Permit #102325 to Further Reduce Non-Growing Season Groundwater Nitrate Risks and to Adjust the Secondary Treatment Compliance Schedule

Dear Mr. Sterger,

The Port of Morrow (Port) operates an industrial wastewater reuse facility that land applies wastewater from food processors and other industries near Boardman, Oregon, in accordance with Water Pollution Control Facilities (WPCF) Permit #102325 (Permit). The Port requests two modifications to the Permit. First, to further reduce non-growing season (NGS) groundwater nitrate risks, the Port requests replacing the blanket prohibition in Permit Condition A(13)(A)(ii) on applying wastewater to sites with 30 pounds or more per acre of nitrate in the fourth and fifth foot soil profile with the more protective and nuanced performance-based approach described below. Second, to address unforeseeable delays in the construction of secondary treatment facilities, the Port requests a four-year extension in the secondary treatment construction and startup deadlines in Permit Condition C(4). Because the Port expects to complete NGS storage facilities ahead of schedule, the Port does not expect the delay in the completion of the secondary treatment facilities to have any effect on NGS Permit compliance.

I. Permit Modification to Establish a Performance-Based Approach for NGS Wastewater Application

Background

Permit Condition A(13)(A)(ii) prohibits the Port from applying irrigation water during the NGS to fields with a soil nitrate concentration in the 4th and 5th foot greater than or equal to 30 pounds (lbs)/acre (herein referred to as "the 30-lb rule"). Permit Condition A(13)(A)(iii) prohibits the Port from applying additional irrigation water during the NGS to fields where the soil moisture is greater than or equal to 75% of the 4th foot water holding capacity (WHC) (herein referred to as the 75% moisture rule). Further, Permit Condition A(13)(A)(iv) limits the Port to using only the available WHC in the top three feet of soil during the NGS. These interim limits apply until November 1, 2026, when the Permit requires all wastewater to be stored during the NGS except as approved by DEQ for beneficial uses with treated wastewater meeting the concentration limits in Table A1 of the Permit.

In addition to these Permit conditions, the Port has also developed, in agreement with DEQ, a risk-based ranking of fields to guide the application of wastewater during the NGS. This Field Ranking Risk Scoring Approach (GSI, 2023) categorizes fields as "low," "medium," and "high" risk based on several factors, including proximity to downgradient domestic drinking water wells and proximity to groundwater. Once the higher-risk fields are removed from the NGS wastewater application program and

the Port has screened the lower-risk fields for those that pass both the 75% moisture and 30-lb rules, only a fraction of the fields in the Port’s program can receive NGS wastewater.

Justification for Modification

Although the 30-lb rule is intended to reduce potential leaching of nitrate to groundwater, the rule in practice decreases the available fields (total area) the Port may use to apply wastewater, thereby increasing the total hydraulic loading to individual fields when applying a fixed wastewater volume. This practice can lead to individual fields exceeding the 75% moisture rule and reduce the amount of nitrogen the field may receive the following spring and summer (a critical period for crop development and maximum nitrogen uptake) without exceeding an agronomic rate (see Conditions A(8) and A(9) of the Permit). For example, Figure 1 below demonstrates a hypothetical scenario where a single field receives the full volume of its WHC in the top three feet as allowed under Condition A(13)(A) of the Permit, with the 4th foot approaching the 75% soil moisture limit. If other fields with a 4th and 5th foot nitrogen concentration greater than 30 lbs were allowed to receive wastewater, the same volume of water currently applied to the single field could be spread to the other fields and managed within the top portion (0 to 3 feet below ground surface) of the soil profile. In doing so, the Port would reduce saturation through the profile (i.e., into the 4th and 5th foot) from wastewater application and potentially reduce the total mass of nitrate that could reach groundwater.

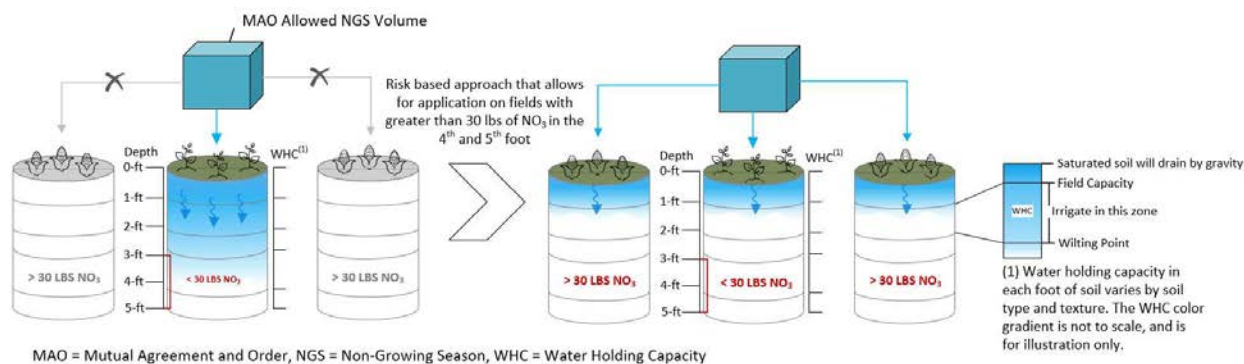


Figure 1. Example of the 30-lb Rule Impact on Available Land Application Area for the Non-Growing Season.

Simply spreading wastewater to other fields, however, would not necessarily reduce the total amount of potential nitrate leaching to groundwater, since it is also dependent on the total nitrate concentration in the soil profile, among other factors (e.g., precipitation events, WHC, soil type/texture, farming practices, etc.). For this reason, the Port proposes to replace the 30-lb rule with a risk-based approach that is consistent with Condition A(13)(A)(i) of the Permit, as well as NGS restrictions based on the Field Ranking Risk Scoring Approach (GSI, 2023) and total soil profile nitrate concentrations. Using the performance-based approach, fields would be evaluated prior to the NGS for soil moisture, WHC, and total nitrate concentration throughout the 5-foot soil profile to calculate the proper application rates dispersed among more qualifying fields.

For example, Figure 2 below shows the starting soil nitrate concentration in fields from the 2023-2024 non-growing season irrigation program.¹ Figure 2 illustrates how certain fields that pass the 30-lb rule

¹ For simplicity, Figure 2 does not consider the WHC or soil moisture content, which would need to be considered when evaluating the ability to apply wastewater during the NGS.

may qualify to receive NGS wastewater, even though they have more total nitrate in the 5-foot profile than other fields that were excluded. When Figures 1 and 2 are considered together, they demonstrate how fields that pass the existing 30-lb rule (but have a higher total nitrate concentration in the soil profile) may receive more wastewater than would occur if the same volume were spread to additional fields with lower total nitrate in the soil profile but which do not pass the 30-lb rule.

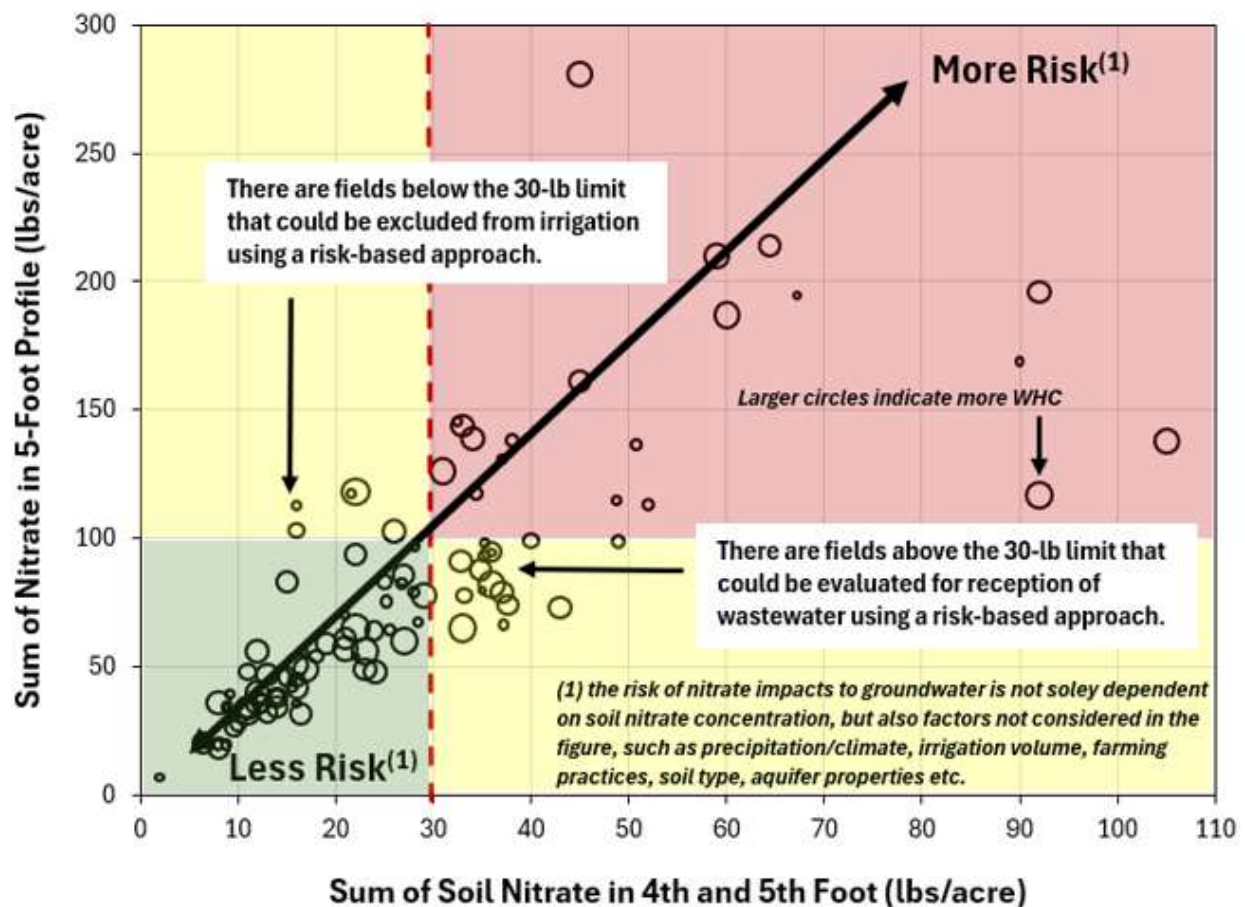


Figure 2. Example of risk-based screening of fields that might be included in the non-growing season irrigation program based on the total nitrate in the soil profile.

Based on the concepts outlined above, the Port requests DEQ remove Condition A(13)(A)(ii) and replace it with a risk-based approach to be approved by DEQ on a field-by-field basis. The Port would submit a plan for approval to DEQ that describes the criteria and monitoring used to select fields for the 2024-2025 non-growing season irrigation program. This plan would be submitted by October 1, 2024, and approval would be needed by October 31, 2024.

The proposed plan to be submitted to DEQ for approval before any irrigation could occur would include:

- a list of fields that were evaluated for NGS land application
 - The list would exclude fields ranked as high risk based on the Field Ranking Risk Scoring Approach (GSI, 2023), as well as fields with a total soil profile nitrate concentration of 150 lbs/acre or more
- the criteria used to select fields based on their risk and likelihood to leach nitrate including:

- available WHC and starting soil moisture
- total soil nitrate concentration (in the 5-foot profile)
- results of modeling of leaching potential using software programs (e.g., United States Department of Agriculture (USDA) publicly available tools)
- the results of forward predictive modeling of anticipated volumetric capacity that may include additional climatic and physical variables such as precipitation, evapotranspiration, and evaporation in order to more accurately consider dynamic changes in soil moisture
- the volume and timing of wastewater to be applied to each field
- any additional monitoring beyond what is described in the Port's Operations, Monitoring, and Management (OM&M) Plan (e.g., additional soil moisture monitoring or increased soil nitrate testing)
- farming best management practices (BMPs) intended to reduce the potential for leaching and mobilization (e.g., irrigation scheduling, denitrification inhibitors)

Proposed Permit Modification

The Port proposes to modify Permit Condition A(13)(A) as follows:

- (A) The OM&M plan must include, but is not limited to, the following terms and conditions for operations during the non-growing season:
- (i) Application sites must be ranked and evaluated according to the presence and location of nitrogen and moisture in the soil profile, and water holding capacity, modeled nitrate leaching potential using publicly available models, and other factors, ~~the moisture level in the 4th foot of the soil profile,~~
 - (a) Based on the evaluation, the Port shall submit a Non-Growing Season Irrigation Plan on or before October 15th of each year for DEQ approval prior to the beginning of each non-growing season that describes how the Port will select sites for non-growing season irrigation,
 - (b) The Port shall irrigate sites during the non-growing season in accordance with the approved Non-Growing Season Irrigation Plan,
 - (c) Application sites are prohibited from receiving non-growing season irrigation if they are ranked as "high risk" in accordance with the Non-Growing Season Irrigation Plan approved by DEQ,
 - (ii) Application sites where the sum of soil nitrate, ~~in the 4th and 5th foot,~~ in the top five feet of soil is greater than or equal to ~~30~~ 150 lbs/ac are prohibited from receiving non-growing season irrigation,
 - (iii) Application sites are prohibited from receiving non-growing season irrigation if they are ranked as "high risk" in accordance with a NGS risk-ranking plan approved by DEQ and that takes into consideration the distance to downgradient domestic drinking water wells, depth to groundwater, and other factors,
 - (~~iiiiv~~) Application sites with soil moisture in the 4th foot of the soil profile equal to or greater than 75% of the 4th foot water-holding capacity are prohibited from receiving additional non-growing season irrigation,
 - (v) Non-growing season irrigation is to be limited to utilization of the available water-holding capacity in the top three (3) feet of the soil column, only, and
 - (vi) Non-growing season irrigation events will be planned based on the most recent soil moisture monitoring event.

-
- (vii) These interim limits apply until November 1, 2026 when non-growing season wastewater will be stored except as approved by DEQ for beneficial uses with treated effluent.

II. Permit Modification to Address Secondary Treatment Construction Delays

Background

Permit Condition C(4) requires the Port to design and construct a secondary wastewater treatment system in order to achieve the NGS land application limits for total nitrogen, total suspended solids, biochemical oxygen demand, and pH in Table A1 to Permit Condition A(14). These NGS limits take effect on November 1, 2025.

To meet the effective date of the limits, Permit Condition C(4) required the Port to design the secondary treatment facilities and submit a draft plan and specifications for DEQ approval by December 31, 2023. The Port has met these deadlines. The next substantive deadline is the July 1, 2025 deadline to complete construction and startup of the secondary treatment system. This is followed by an October 1, 2025, deadline to submit a secondary treatment performance study to DEQ, and then the November 1, 2025, deadline to meet the Table A1 NGS land application limits.

Justification for the Modification

The Port's efforts to construct the secondary treatment facilities have been affected, like those of many other public and private entities proposing large-scale construction projects, by substantial cost increases and anticipated delays in obtaining critical components. The only acceptable bid that the Port received for the project was nearly twice the amount budgeted and substantially exceeded the amount that the Port is currently able to finance, given the many other improvements in the Port's reuse system that it is currently undertaking, including but not limited to the recently completed anaerobic digester project, the construction of NGS storage facilities, and expansion of the acreage available for land application. The unexpectedly high cost of the secondary treatment system has led the Port to reevaluate the design of the system and explore additional financing options. To allow sufficient time for these efforts and to complete construction of any revised design, including obtaining required components, which are subject to "Buy American" requirements that increase costs and acquisition times, the Port requests a four-year extension of the remaining components of the Permit's secondary treatment schedule.

The potential risk to groundwater of the requested extension should be minimal or zero. Although the Permit currently requires all NGS land application to meet the Table A1 limits by November 1, 2025, Permit Condition A(14)(B) requires all NGS wastewater to be stored by November 1, 2026. Thus, the only NGS that could be affected by any delay in meeting the Table A1 limits would be the 2025-26 NGS. Moreover, the Port anticipates that the necessary storage facilities will be constructed and available for use by November 1, 2025—a year earlier than required. If the storage facilities are constructed and available by November 1, 2025, the Port could avoid land-applying any NGS wastewater that does not meet the Table A1 NGS land application limits by the current deadline.

Proposed Permit Modification

The Port proposes to modify Permit Condition C(4) by extending the “Complete construction and startup” deadline to July 1, 2029; by extending the deadline for submitting to DEQ a summary of the performance of the secondary treatment system to October 1, 2029; and by extending the deadline for complying with the Table A1 limits in Permit Condition A(14) to November 1, 2029. The Port also proposes to add to the schedule requirements to submit project status reports on July 1, 2025, 2026, 2027, and 2028.

Since the NGS storage facilities are anticipated to come online one year early, the Port also proposes to modify Permit Condition C(5) by moving the “Complete construction” deadline to November 1, 2025 and by extending the deadline for complying with the Table A1 limits in Permit Condition A(14) to November 1, 2029.

For consistency with these modifications, the Port proposes to change the deadline in Permit Condition A(14) for meeting the Table A1 concentration limits to November 1, 2029.

Closing

Thank you for considering this request. Under the proposed performance-based approach, the expeditious collection of fall soil samples for measurement of nitrate will be critical to applying the evaluation criteria and providing DEQ adequate time for review prior to any NGS irrigation. Therefore, it will be essential to obtain DEQ action on the proposed modifications as expeditiously as possible in order to establish the criteria that are protective of groundwater, such that the metrics can be transparently applied and the Port can communicate effectively with its teaming partners, farmers, and the industrial discharges ahead of the upcoming NGS.

Thank you for your consideration.

Sincerely,

A handwritten signature in black ink, appearing to read "Miff Devin", with a horizontal line extending from the end of the signature.

Miff Devin

References

GSI Water Solutions, Inc., 2023. Land Application – Irrigation Circle Risk Ranking Winter Irrigation Compliance Plan. May 5, 2023. *Updated October 2023*.

Attachments

Parametrix, 2024. Assessment of WPCF Permit Schedule A(13)(A)(ii) Technical Memorandum.

DATE: August 12, 2024
TO: Miff Devin, Port of Morrow
FROM: Joe Mitzel, PE; Lauryn Guerrissi, EIT (Parametrix)
SUBJECT: Assessment of WPCF Permit Schedule A(13)(A)(ii)
PROJECT NUMBER: 233-7464-004
PROJECT NAME: Operations, Monitoring, and Management Plan – Continued Support



Introduction

The Port of Morrow (Port) operates a land application system for recycled industrial wastewater under Water Pollution Control Facilities (WPCF) Permit 102325 (Permit). Schedule A(13)(A) of the Permit specifies the following conditions for land application activities conducted during the non-growing season, defined in the Permit as November 1 through February:

- (i) *Application sites must be ranked and evaluated according to the presence and location of nitrogen in the soil profile, and the moisture level in the 4th foot of the soil profile,*
- (ii) *Application sites where the sum of soil nitrate, in the 4th and 5th foot, is greater than or equal to 30 lbs/ac are prohibited from receiving non-growing season irrigation,*
- (iii) *Application sites with soil moisture in the 4th foot of the soil profile equal to or greater than 75% of the 4th foot water-holding capacity are prohibited from receiving additional non-growing season irrigation,*
- (iv) *Non-growing season irrigation is to be limited to utilization of the available water-holding capacity in the top three (3) feet of the soil column, only, and*
- (v) *Non-growing season irrigation events will be planned based on the most recent soil moisture monitoring event.*
- (vi) *These interim limits apply until November 1, 2026 when non-growing season wastewater will be stored except as approved by DEQ for beneficial uses with treated effluent.*

The Port has requested that Parametrix evaluate the impacts of Condition (ii), herein referred to as the 30-lb rule, in conjunction with Conditions (iii) through (iv) on land application area availability during the non-growing season, and subsequent risk of exceeding water holding capacities of available fields or increasing the potential for nitrate to reach groundwater.

Conceptual Framework

In general, the total hydraulic capacity of the Port's recycled water system is dependent on available storage pond capacity and the soil water holding capacity (WHC) of fields within the WPCF program. Since storage pond capacity is fixed, this analysis focuses solely on the soil WHC component of the



overall system capacity. WHC is defined as the amount of water a specific soil can hold in its pore space against the force of gravity; any water applied in excess of a soil's WHC may be subject to downward movement through the soil profile along with mobile dissolved substances, such as nitrate. The Port maintains WHC measurements for each foot of the 5-foot soil profile for all fields within the WPCF program and manages all irrigation based on these measurements.

During the non-growing season, Schedule A(13)(A)(ii) limits the number of fields available for land application to only those that have less than 30 pounds per acre (lbs/acre) of total nitrate in the 4th and 5th foot of the soil profile. Correspondingly, this limits the area over which recycled water can be applied and reduces the available WHC of the system. As illustrated in Figure 1, if a fixed volume of recycled water is applied over a smaller area (as limited by the 30-lb rule), the potential of exceeding the WHC of the soil profile and subsequent leachable recycled water volume within that area is increased. This practice may also concentrate nitrate in the leachate over a smaller volume of groundwater such that when mixed, less dilution is available from the groundwater.

Conversely, as available land application area increases, available soil WHC also increases, and the same fixed volume of water can be spread out across more fields with less risk of exceeding the available capacity of each individual soil profile. Since the larger area provides more WHC, the volume of recycled water that could leach is reduced. Additionally, any leachate that reaches the aquifer mixes with a larger groundwater volume resulting in a reduced mixed groundwater concentration compared to the same volume of recycled water applied over the smaller area.

The objective of the analysis presented herein is to quantify the above-described conceptual framework using site-specific data from a past non-growing season. **Please note:** The analysis provides a general quantification of this conceptual framework only, and it is not necessarily representative of actual leaching conditions during any specific non-growing season.

Methodology

Modeling Approach

The Oregon Department of Environmental Quality (DEQ) previously used the Washington State Department of Ecology (Ecology) *Spreadsheet Models for Determining the Influence of Land Applications of Fertilizer on Underlying Groundwater Nitrate Concentration* (Ecology 2014) (herein referred to as *Spreadsheet Models*) to assess the Port's impacts to groundwater nitrate concentrations from non-growing season recycled water application (DEQ 2021); therefore, Parametrix considered using the same model for the present analysis for consistency. However, after reviewing both DEQ's original assessment and the underlying equations in the *Spreadsheet Models*, Parametrix determined that the model would not be suitable because it does not account for soil WHC. Without accounting for soil WHC, leachable recycled water volumes and mixed groundwater concentrations would likely be grossly overestimated since it is assumed that all applied recycled water would leach. For example, in DEQ's 2021 assessment, modeled mixed groundwater concentrations were approximately 2 to 12 times higher than observed concentrations.

Parametrix also evaluated the use of the Idaho Department of Environmental Quality (IDEQ) Reuse System Modeling Tool (the RU Toolbox) (IDEQ 2012), which consists of two spreadsheets: (1) a "Nutrient/Hydraulic Balance Module" spreadsheet that estimates nitrate leachate concentration from a land application area based on the planted crop, precipitation, evapotranspiration, soil WHC, applied recycled water, applied freshwater, and applied nitrogen, and (2) a "GW Contaminant Transport Module" spreadsheet that estimates downgradient mixed groundwater concentration based on the leachate concentration output of Spreadsheet (1). Although this model does account for WHC, Parametrix determined that it is overly complex for the present high-level, program-wide

analysis and is better suited for evaluating leaching and downgradient groundwater impacts from specific fields.

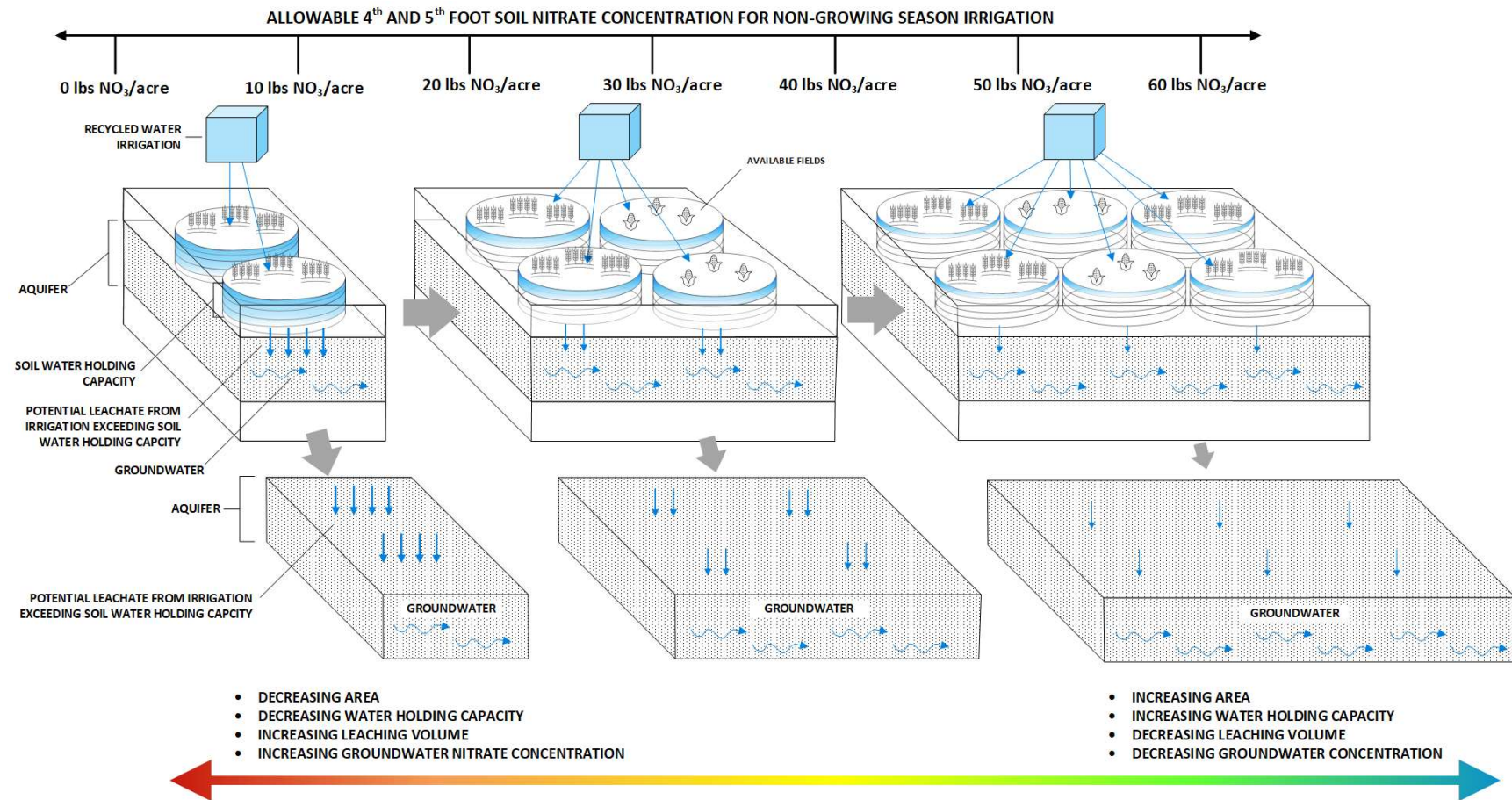


Figure 1. Conceptual Framework for Evaluation Non-Growing Season Land Application Area

As a result, Parametrix adapted calculations from concepts used in both the *Ecology Spreadsheet Models* and the IDEQ RU Toolbox models for the present analysis. The calculations are described in the Evaluated Data, Assumptions, and Calculations section below, and they account for soil WHC in a manner consistent with how WHC is used in the Permit (e.g., Schedule A(13)(A)(iii)-(iv)) for irrigation management and protection of groundwater.

Evaluated Data, Assumptions, and Calculations

For this analysis, Parametrix evaluated the total applied recycled water volume, soil nitrate, soil moisture, and soil water holding capacity data for fields in Farms 1, 3, 4, and 5 that were eligible for irrigation at the start of the 2023 non-growing season (October 31, 2023). The following assumptions were used for the analysis:

- The capacity available at the beginning of the non-growing season (October 31) represents the entire capacity for the whole season.
- Recycled water applied is equal to the entire 2023 non-growing season volume, which was approximately 785 million gallons (MG).
- Fields are considered eligible for irrigation only if they are low or medium risk to groundwater as ranked by the Port's Field Ranking Risk Scoring Approach (GSI 2023).
- Calculated capacity is based on the 3-foot WHC of fields that had less than 75% soil moisture in the 4th foot as required by Schedule A(13)(A)(iii)-(iv).
- Precipitation and evapotranspiration were not accounted for in this analysis.
- The concentration of nitrate in the Port's recycled water has historically been <1 mg/L; therefore, Parametrix assumed a recycled water nitrate concentration of 1 mg/L for this analysis.
- The sum of nitrate in the full 5-foot profile is considered leachable if the applied recycled water volume exceeds the actual available capacity of the 3-foot soil profile (field WHC less the starting soil moisture). Leachable nitrate is calculated using the concentration in the 3-foot profile that is displaced by recycled water. Therefore, if the applied recycled water is less than the total 3-foot WHC, only the incremental displacement volume (recycled volume less the total 3-foot WHC) is used to calculate leachable nitrate. If the applied recycled water is greater than the total 3-foot profile WHC, then leachable nitrate is calculated using the total 3-foot WHC (and no more), because once the nitrate in the soil is flushed through (by exceeding the total 3-foot WHC), there is no more nitrate available to leach.
- Ammonium concentrations in soil and wastewater were not included in this analysis because ammonium is the less mobile form of nitrogen. Additionally, nitrification, defined as the conversion of ammonium to nitrate, is expected to be negligible during the non-growing season when soil temperatures are low.
- Simple groundwater mixing calculations were performed based on site-specific aquifer parameters obtained from GSI Water Solutions, Inc. (GSI) and a regional hydrogeology report (Grondin et al. 1995). Since the hydrogeology beneath the Port's land application system is complex, consisting of alluvial deposits and Columbia River Basalt Group (CRBG) flows with both shallow and deep confined and unconfined aquifer systems (GSI 2023), a range of hydraulic conductivity values (250 to 3,000 feet per day [ft/day]) were used for the mixing assessment. The purpose of this assessment is not to provide a detailed analysis of the hydrogeologic characteristics of the aquifer underlying the Port's program but, rather, to provide the magnitude of mixed concentrations that might be expected with different land application areas and associated soil nitrate concentrations.

Estimated capacity, potentially leachable recycled water volume, and potentially leachable nitrate mass were calculated using Equations (1), (2), and (3), respectively:

$$\text{Actual Soil Capacity (3ft)}[\text{gal}] = \sum_{i=1}^{i=3\text{ft}} \text{WHC}_i[\text{gal}] * (1 - \text{Soil Moisture}_i[\%]) \quad (1)$$

$$\text{Potentially Leachable Volume}[\text{gal}] = \text{Wastewater Volume}[\text{gal}] - \text{Actual Soil Capacity (3ft)}[\text{gal}] \quad (2)$$

$$\text{Potentially Leachable Mass} \left[\frac{\text{lbs}}{\text{acre}} \right] = \frac{\left(\frac{\sum_{i=1}^{i=5\text{ft}} \text{NO}_3[\text{lbs}]}{\sum_{i=1}^{i=3\text{ft}} \text{WHC}_i[\text{gal}]} + \text{Recycled Water NO}_3 \left[\frac{\text{lbs}}{\text{gal}} \right] \text{NO}_3 \right) * \text{Potentially Leachable Volume}[\text{gal}]}{\text{Area}[\text{acre}]} \quad (3)$$

The calculations denoted in Equations (1) through (3) are further illustrated in Figure 2.

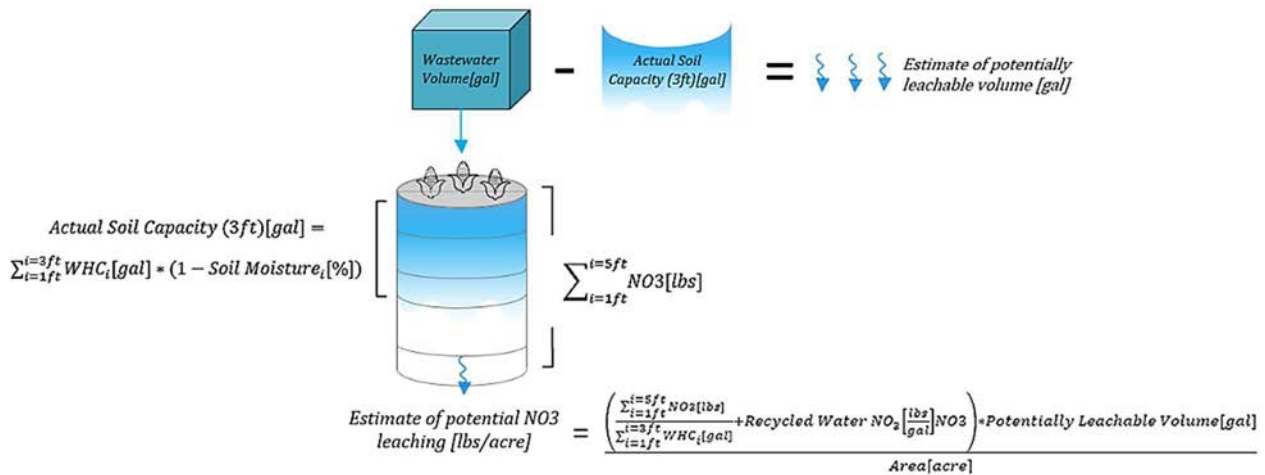


Figure 2. 2023 Non-Growing Season: Modeled Capacity of Fields as a Function of 4th and 5th Foot Soil Nitrate

In addition to capacity and leaching calculations, Parametrix performed a simple groundwater mixing calculation using the Darcy equation for groundwater flow (Equation (4)) with a mass balance (Equation (5)) similar to the methodology presented in the *Ecology Spreadsheet Models*.

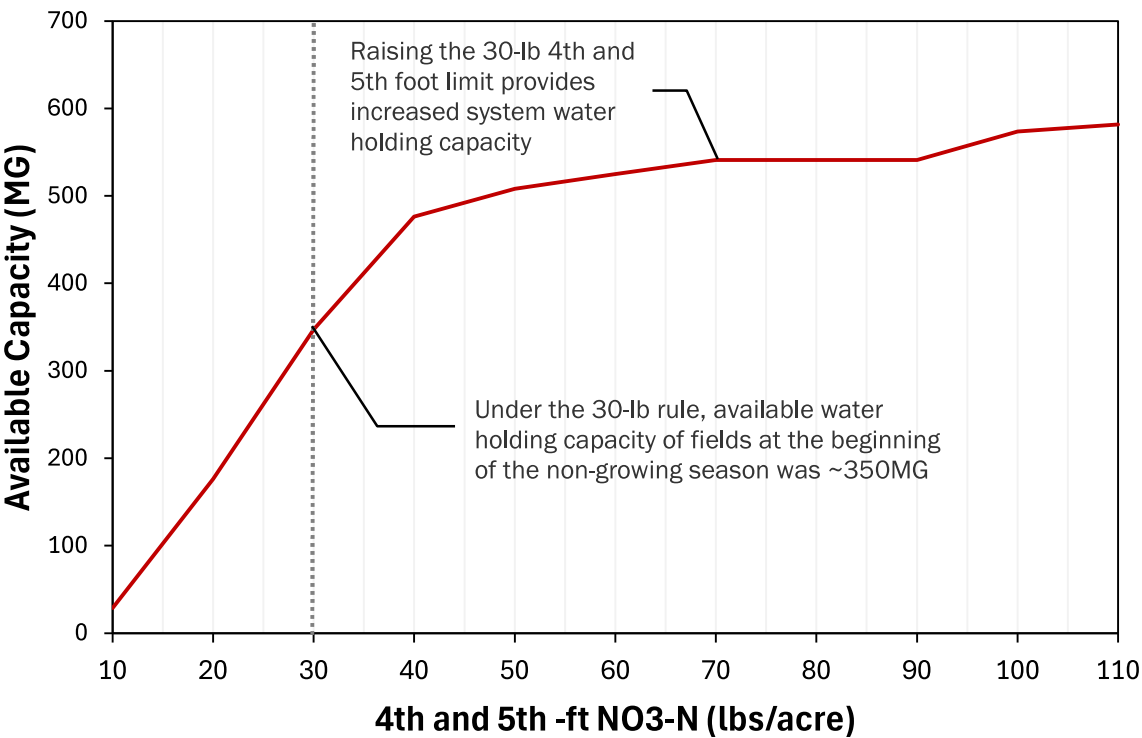
$$Q_{GW} \left[\frac{\text{gal}}{\text{day}} \right] = k \left[\frac{\text{ft}}{\text{day}} \right] * i \left[\frac{\text{ft}}{\text{ft}} \right] * A[\text{ft}^2] * 7.48 \left[\frac{\text{gal}}{\text{ft}^3} \right] \quad (4)$$

$$C_{\text{NO}_3, \text{mixed}} \left[\frac{\text{mg}}{\text{L}} \right] = \frac{Q_{GW}[\text{gal/day}] * C_{GW}[\text{mg/L}] + Q_{RW}[\text{gal/day}] * C_{RW}[\text{mg/L}]}{Q_{GW}[\text{gal/day}] + C_{GW}[\text{gal/day}]} \quad (5)$$

Where Q_{GW} and Q_{RW} are the flows of groundwater and recycled water, respectively, k is the aquifer hydraulic conductivity, i is the hydraulic gradient, A is the modeled mixing area (i.e., land application area), $C_{\text{NO}_3, \text{mixed}}$ is the concentration of nitrate in mixed groundwater and recycled water, C_{GW} is the concentration of nitrate in groundwater (assumed 0), and C_{RW} is the concentration of nitrate in recycled water (including leached soil nitrate). As noted in the list of assumptions, aquifer parameters (k and i) were obtained from site-specific hydrogeologic characterization data provided by GSI and the Grondin et. Al, (1995) regional hydrogeology report. A range of k values from 250 ft/day (representative of Farms 4 and 5) to 3,000 ft/day (representative of Farms 1 and 3) and an average i value of 0.007 feet per foot (ft/ft) (representative of all farms) were used for this analysis. Parametrix was unable to compare the estimated k and i values with those used by DEQ in the 2021 assessment because specific values were not reported in DEQ's memorandum.

Results

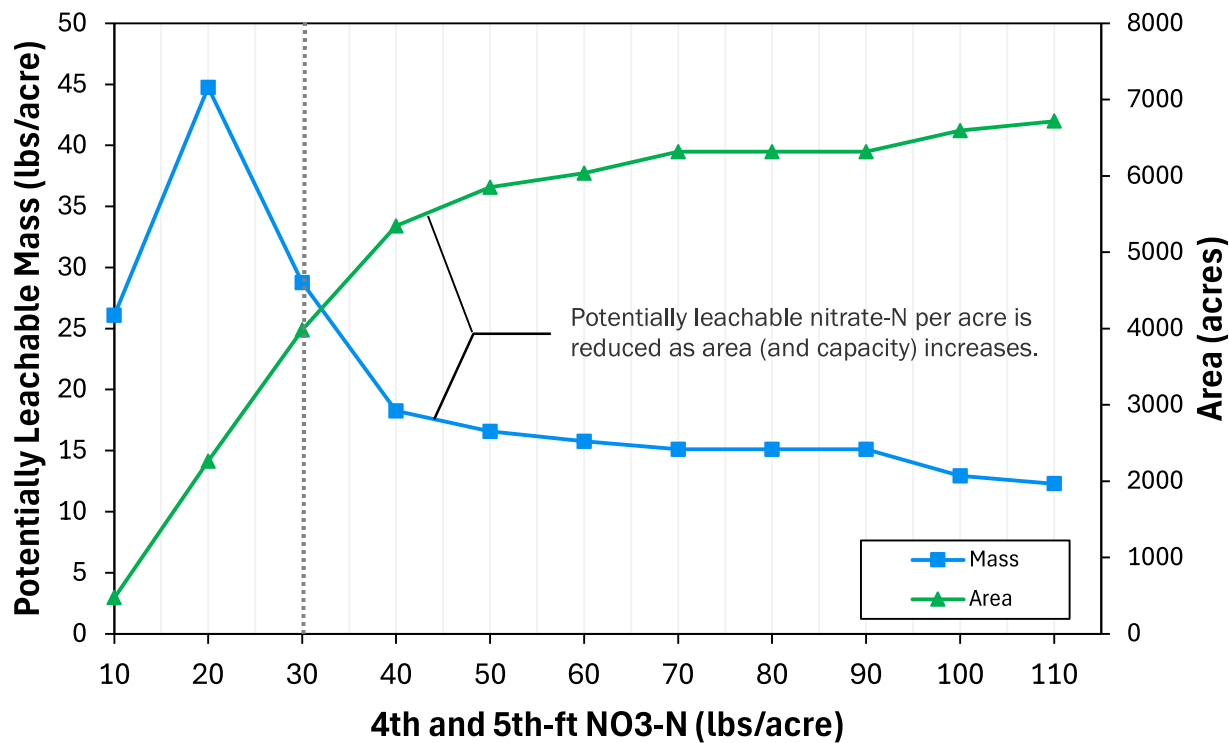
Figure 3 below shows available capacity for the beginning of the 2023 non-growing season as calculated by Equation (1). As seen in the figure, when the 30-pound limit is raised, the available capacity of the system increases because of the increase in fields available for irrigation. Under the 30-lb rule, the soil showed approximately 350 MG of capacity; however, if fields with 4th and 5th foot nitrate concentration of 50 to 60 lbs/acre are included in the program, capacity increases to approximately 500 MG. Capacity does not significantly increase if fields above 50 to 60 lbs/acre are included because 4th and 5th foot nitrate for a majority of the fields within the Port’s program fell below 50 to 60 lbs/acre in 2023.



Notes:
Modeled volumes represent estimated available capacity at the beginning of the NGS in 2023, after removing fields that were "high risk" to groundwater (GSI, 2023) or violated the 75% moisture rule.

Figure 3. 2023 Non-Growing Season: Modeled Capacity of Fields as a Function of 4th and 5th Foot Soil Nitrate

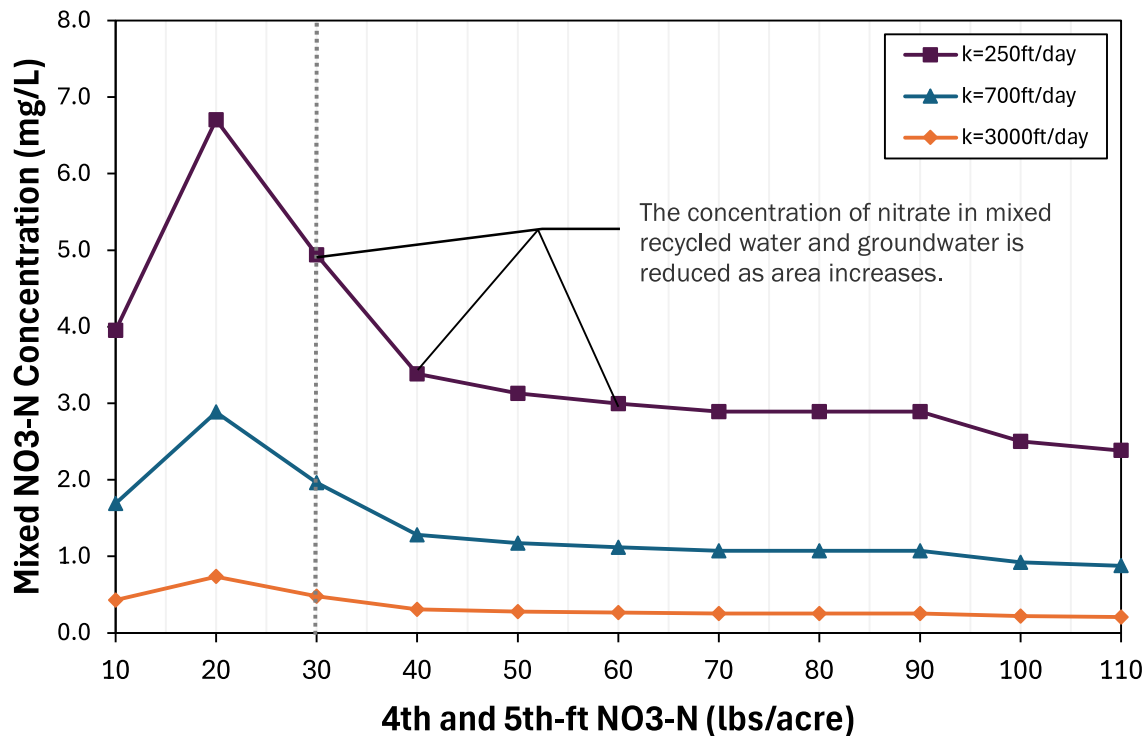
Figure 4 below shows the increase in available land application area and corresponding reduction in potentially leachable nitrate per acre as the 4th and 5th foot nitrate limit is increased from 10 lbs/acre to 110 lbs/acre. The plot demonstrates that the mass of nitrate leached per acre can be higher when leaching is concentrated over a smaller land application area (such as the area limited by the 30-lb rule) compared with land application over a larger area (if the 4th and 5th foot nitrate limit is raised). This trend is directly related to the increase in available capacity (with increasing land application area) and can be seen by comparing the similarity in shape between the area line (green with triangles) in Figure 4 and the capacity line (red) shown in Figure 3.



Notes:
Masses represent estimated potentially leachable NO3-N mass based on simple model for application of 2023 non-growing season volume. Estimates are computed for conceptual demonstration and do not represent actual masses leached.

Figure 4. 2023 Non-Growing Season: Modeled Potentially Leachable Nitrate-N and Land Application Area as a Function of 4th and 5th Foot Soil Nitrate-N

Figure 5 presents results from the simple groundwater mixing calculations performed using Equations (4) and (5) for a range of hydraulic conductivity values. The general trend is that mixed groundwater concentration decreases as the 4th and 5th foot nitrate rule is expanded, both because the potentially leachable mass per acre is decreased (see Figure 4) and because the volume of groundwater over which the recycled water is applied is increased.

**Notes:**

Modeled mixed concentrations represent estimated concentration of NO₃-N in groundwater once mixed with hypothetically leached recycled water from the 2023 NGS volume. Assumes background groundwater NO₃-N concentration is 0 mg/L. Reported concentrations do not represent actual conditions.

Figure 5. 2023 Non-Growing Season: Modeled Groundwater Nitrate-N Concentration Mixed with Potentially Leachable Recycled Water

Conclusions and Recommendations

Our analysis of Condition (ii) (the 30-lb rule) in conjunction with Conditions (iii) through (iv) of Schedule A(13)(A) of the Permit, demonstrates that restricting the available land application area (and capacity) for a fixed volume of recycled water may concentrate nitrate leaching over that area, which could result in a flux of groundwater with higher nitrate concentration compared with the same volume of recycled water applied over a larger area (with larger capacity).

Since actual leaching conditions are dependent on field-specific factors beyond the 4th and 5th foot soil nitrate concentration (e.g., nitrate concentration in the full 5-foot profile, crop rooting depth, soil characteristics, best management practices), Parametrix recommends that the Port use a more protective risk-based approach to evaluate individual fields for non-growing season irrigation based on available WHC, soil moisture, and total nitrate in the 5-foot profile in lieu of Schedule A(13)(A)(ii) of the Permit.

References

- DEQ (Department of Environmental Quality). 2021. Assessment of Groundwater Nitrate Impacts from Port of Morrow Wintertime Wastewater Application. Unpublished memorandum by DEQ to Chad Gubala, PhD, Pendleton, OR.
- Ecology (Washington State Department of Ecology). 2014. Spreadsheet Models for Determining the Influence of Land Applications of Fertilizer on Underlying Groundwater Nitrate Concentrations, Publication No. 14-03-018. Washington State Department of Ecology, Olympia, WA.
- Grondin, G.H., K.C. Wozniak, D.O. Nelson, and I. Camacho. 1995. Hydrogeology, Groundwater Chemistry and Land Uses in the Lower Umatilla Basin Groundwater Management Area.
- GSI (GSI Water Solutions, Inc.). 2023. Groundwater Monitoring Plan, Port of Morrow.
- IDEQ (Idaho Department of Environmental Quality) – Technical Services Division. 2012. Wastewater Reuse/Land Treatment System Modeling.

Attn: Justin W. Sterger
Senior Water Quality Permit Writer
Oregon Department of Environmental Quality 475 NE Bellevue Dr., Suite 110
Bend, OR 97701

8-21-24

RE: Secondary Treatment System Compliance Schedule Revisions

Justin,

The Port of Morrow's August 12, 2024, request to modify its Water Pollution Control Facilities permit (Permit) included a request to extend the deadline for completing construction of secondary treatment facilities to July 1, 2029, and for achieving the permit's Table A1 limits to November 1, 2029. In response to your request for additional information to support the requested extension, the Port has reevaluated the time needed. Based on this reevaluation, the Port has refined its requested extension and requests that the secondary treatment deadlines in Permit Schedule C.4 be modified as follows:

Complete By	Requirement
September 1, 2025	Submit a Preliminary Design Report to DEQ for review of the revised proposed Secondary Treatment System. The preliminary design report must include updated nitrogen and hydraulic balances to document system capacity upon completion of the project.
April 1, 2026	Submit 90% Plans and Specifications to DEQ for review of the revised proposed Secondary Treatment System. The 90% plans must address all DEQ comments on the Preliminary Design Report.
April 1, 2027	Submit to DEQ a project status report.
April 1, 2028	Submit to DEQ a project status report.
April 1, 2029	Submit to DEQ a project status report.
July 1, 2029	Complete construction and startup.
October 1, 2029	Submit to DEQ a summary of performance for the Secondary Treatment System. The summary must include a comparison of the wastewater characteristics in Table B8 before and after secondary treatment.
November 1, 2029	The permittee must comply with Schedule A(14) effluent limits for wastewater land applied in the non-growing season.

This revised request is based on the following information and time estimates.

The Port of Morrow received two bids to construct the Secondary Treatment System that the Port previously designed with DEQ approval to achieve a total nitrogen concentration of 7 milligrams per liter (mg/L) or less. The low bid was \$45,080,000 over budget with contingency built in, would not be constructed within the required schedule, and was beyond the Port's ability to finance. After the Port's value engineering efforts with its engineering consultant did not significantly reduce the bidder's price, the Port determined that the design would need to be substantially revised in order to meet the objectives of the Permit at a reasonable and feasible cost.

The Port also notes that the total nitrogen and other effluent limitations set forth in Table A1 of the Permit apply only to wastewater applied during the non-growing season (November through February). Because the Permit also requires the Port to construct wastewater storage facilities that will enable the Port to comply with the Permit's prohibition on non-growing season applications of wastewater after November 1, 2026 (unless authorized by DEQ for beneficial reuse), there will be no need for the Secondary Treatment System to achieve the 7 mg/L total nitrogen and other Table A1 limits once the Port has constructed the wastewater storage facilities, which are expected to be completed by November 1, 2025, a year earlier than required. Accordingly, the Secondary Treatment System could be redesigned solely to comply with Permit Condition A(14)(A), which provides that the Port "must utilize the wastewater treatment system year-round as necessary to ensure permit compliance." This should create additional design flexibility by enabling the design to focus on ensuring sufficient treatment to achieve growing-season agronomic rate limits.

Since determining that a redesign was needed, the Port has been engaged in discussions with its engineering consultant on the process and objectives for redesigning the treatment system. Based on these discussions, it has become clear that the Port's agreement with the engineering consultant needs to be revised to better align the consultant's scope of work with the Port's design needs. The Port estimates that an additional 6-8 weeks will be needed to revise the agreement.

Once the agreement is revised, the Port anticipates that a redesign will require 14 weeks. The redesign will then have to be discussed and refined with the low bidder, which the Port anticipates will require 8 weeks. Assuming no further issues or changes will need to be made in the design between the designer and contractor, a construction schedule can be developed. Allowing for unexpected contingencies, the Port anticipates that it will be able to submit a revised Preliminary Design Report to DEQ for its review and approval no later than September 1, 2025.

Once a revised Preliminary Design Report is submitted to DEQ, the Port anticipates that a schedule similar to the current Permit schedule could be followed, albeit with a somewhat longer construction schedule to allow for the more extensive delays in receiving critical equipment and components that construction projects are now encountering. Thus, the 90% design could be submitted to DEQ approximately seven months after the Preliminary Design Report (*i.e.*, by April 1, 2026). Assuming no changes in the design that would add construction complexity or add to the lead times for system components, construction could be completed in approximately three years, with an adjustment of the completion date from April to July 2029 to avoid completing construction during the winter season. The performance summary could then be submitted to DEQ by October 1, 2029, with the Permit Table A1 non-growing season limits met by November 1, 2029.

Respectively Submitted,

A handwritten signature in black ink, appearing to read "Miff Devin". The signature is fluid and cursive, with a horizontal line extending from the end of the name.

Miff Devin
Operations Manager
Port of Morrow

INDUSTRIAL LAND APPLICATION SITE CHECKLIST

Directions for checklist: Check (X) appropriate boxes for tables and provide brief narrative where necessary.

APPLICANT INFORMATION

Facility Name:	Farm 6 – Land Application Program Expansion
Permittee Name:	Port of Morrow
NPDES/ WPCF (circle one):	File Number: 70590 Permit Number: 102325
Facility Address:	Farm 6 - 73920 Pole Line Road, Boardman, OR 97818
Contact Name:	Miff Devin
Phone Number:	541-945-2240

TYPES OF WASTE TO BE LAND APPLIED

Describe waste types to be beneficially land applied: Food processing, cooling, and other industrial wastewater as authorized by WPCF Permit No. 102325.

TYPE OF WASTEWATER/SOLIDS FROM TREATMENT PROCESSES

	Activated Sludge		Re-circulating Gravel/Sand Filter
	Mechanically Aerated Lagoon		Rotating Biological Filter
	Aerated Lagoon	X	Other (Specify): Industrial Food Processing, Cooling, and Other Wastewater

TREATMENT EFFICIENCY

	Tertiary Treatment		85% or more BOD/TSS removal
	95% or more BOD/TSS removal		Rotating Biological Filter
	90% or more BOD/TSS removal	X	Other (Specify): Settlement Basins

DISINFECTION TREATMENT METHOD IF APPLICABLE

	Chlorine injection just prior to irrigation		
	Chlorine injection with storage of reclaimed water		
	Chlorine injection after storage just prior to irrigation		
	UV exposure just prior to irrigation		
	UV exposure with storage of reclaimed water		
	UV exposure after storage just prior to irrigation		
	Other (specify):		
X	Non-Disinfected water		Other describe
	Non-Disinfected solids/sludge		

Average Dry Weather Flow, million gallons per day (MGD): Annual average land application flow of 8.5 MGD for the entire land application program of 11,024 acres. This application is for an expansion of that program to add a minimum of 5,350 additional acres. No new wastewater sources are proposed as part of this application.

Directions for checklist: Check (X) appropriate boxes for tables and provide brief narrative where necessary.

ARE THERE ALARMS FOR VARIOUS UNIT PROCESSES?	Yes	No
Are alarms independent of the normal power supply of the plant?	NA	
Failure of a disinfection treatment process?	NA	
Failure of a clarification process?	NA	
Failure of a coagulation process?	NA	
Failure of a filtration process?	NA	
Are the alarms on separate circuit breakers from the reuse pumps?	NA	
Is the Recycled Water back-up generator tested regularly?	NA	

IN THE EVENT OF POWER LOSS:	Yes	No
Can the plant continue to discharge?		X
Can there be any irrigation of non-disinfected water?		X
If yes to either of the above, specify control measures that will be in place to stop the irrigation as soon as possible. The Port manages power loss and other disruptions to the system through surge capacity within the various storage ponds.		

STORAGE IMPOUNDMENT AT FACILITY	Yes	No
Is there a storage facility proposed for this project?	NA	
If yes, at the facility	NA	
If yes, located at a location other than the facility	NA	
If yes to either of the above, specify the location and length of time the storage facility will be used: No new storage is proposed as part of the Farm 6 expansion project. The existing Sand Dune Storage Lagoon is located on Farm 4, approximately 3.0 miles to the east of the proposed expansion area. The lagoon stores water year-round to be applied to the farmland via irrigation pivots.		

INDUSTRIAL SOLIDS and LIQUID LAND APPLICATION SITE INFORMATION*

Property Owners Name: Port of Morrow (contracted future owner) Address: 2 Marine Drive, Boardman, OR 97818 Contact Name: Miff Devin – Port of Morrow Phone Number: 541-376-8107			
<i>Current Owner, pending closing of contracted sale: Canyon Farm, LLC, and Canyon Farm II, LLC 160 Bovet Rd, Suite 310, San Mateo CA 94402 Local Headquarters – 11907 S Gallop Lane, Kennewick, WA 99338</i>			
Property Lessee Name: Address: Contact Name: Phone Number:			
Land Application Contact Name: Miff Devin Phone Number: 541-945-2240			
TWP:	Range:	Sec:	Tax Lot
TWP:	Range:	Sec:	Tax Lot
Attach An Assessor's Map for each Proposed Land Application Site Attachment A - See Attached Tax Lot Table and Map			

ZONED LAND USE OF EACH SITE*:

X	Exclusive Farm Use		Industrial
	Forestry		State/Federal lands
	Rural Residential		Other (Specify):

***If there is more than one land application site in the site evaluation request, then list all proposed sites in an attached table and provide all the requested information in this form for each site.**

Directions for checklist: Check (X) appropriate boxes for tables and provide brief narrative where necessary.

ZONED LAND USE OF AREA AROUND EACH LAND APPLICATION SITE

X	Exclusive Farm Use		Industrial
	Forestry		State/Federal lands
	Rural Residential		Other (Specify):

THE NEAREST DEVELOPED PROPERTY FROM (ft) EACH LAND APPLICATION SITE:

[\(Irrigated Ag Pivots Or CAFO present immediately surrounding Farm 6 Expansion Site\)](#)

North boundary: potential farm worker/residential house ~ 200' from north of expansion area boundary
South boundary: residential house ~ 4,000 feet from south expansion boundary; Finnley Butte Landfill is located SW of site ~ 1 mile; potential farm worker/residential house in section 27
East boundary: potential farm worker/residential house ~ 200' from northeast corner of expansion area boundary at section 23, no other within 1 mile of boundary
West boundary: irrigation pivots for ~ 1.75 miles from western edge of expansion area boundary, followed by the Navy bombing range

What is the nearest developed property downwind of irrigation site (specify type and distance): <u>Unknown – expansion area surrounded by other agricultural land</u>
Are there any playgrounds, schools, or public parks within ½ mile of irrigation site? (specify): <u>No</u>

DOMESTIC WELLS FOR EACH LAND APPLICATION SITE	Yes	No
Are there any domestic wells located within the irrigation site?		<u>X</u>
If yes, within 100 feet?		

Directions for checklist: Check (X) appropriate boxes for tables and provide brief narrative where necessary.

POTENTIAL RUN-OFF POINTS ARE LOCATED AT THE:

	North boundary (specify): <u>No runoff expected to the north (see discussion below about NE corner of Farm 6) (refer to Figure 3)</u>
	South boundary (specify): <u>No runoff expected to the South(refer to Figure 3)</u>
<u>X</u>	East boundary (specify): <u>Pipe failure at one of the pivots in Section 14 or 23 could result in runoff along NE portion of Section 14 (where the Sand Hollow feature crosses the Farm 6 boundary; Section 14)(refer to Figure 3).</u>
<u>X</u>	West boundary (specify): <u>Pipe failure at one of the pivots in Section 17 could result in runoff along western portion of Section 17, otherwise no potential runoff is expected to the West (refer to Figure 3)</u>

PUBLIC ACCESS WILL BE CONTROLLED BY THE FOLLOWING:

	No trespassing or warning signs (specify spacing):
	Fencing (specify type):
<u>X</u>	Other (specify): <u>Signage and private roadways to site with limited access</u>

Prevailing wind direction during irrigation season (specify)generally from the west
Will irrigation be restricted when winds exceed 10 MPH? No

STORAGE IMPOUNDMENT OR STAGING AREAS AT LAND APPLICATION SITE(S)	Yes	No
Are there storage/staging areas proposed at the land application site?		<u>X</u>
If yes to either of the above, If yes, give location(s) with a scaled map show all area to be used. Specify the location and length of time the storage each site will be used: <u>No new storage is proposed for this expansion application.</u>		
Describe staging area access and regress, How will you address track-out issues? <u>NA. No staging areas are proposed. Wastewater will be piped directly to Farm 6 or stored in Farm 4 lagoon and then piped to the expansion area.</u>		

BARRIERS ON BOUNDARIES THAT MAY MITIGATE AEROSOL DRIFT OR ODORS

Natural vegetation (specify height and width):
Natural topography (specify): <u>site has significant topographic relief (ravines)</u>
Tree or fence row (specify height): <u>NA</u>
Other (specify): <u>NA</u>
None:

INDUSTRIAL SOLIDS/LIQUIDS CHEMICAL AND NUTRIENT ANALYSIS

Directions for checklist: Check (X) appropriate boxes for tables and provide brief narrative where necessary.

	Nutrient Analysis (N, P, K, Ca, Mg, S, (specify types nutrient present in recycled solids liquid to be land applied): Attach current and representative analysis of material to be land applied.
X	Soil Analysis done on Parcel/Pasture? Yes/No? Attach most recent analysis. See the Permit and current OMM Plan for soil sampling plan
X	What are the soluble salt and known metals concentrations in solids and or liquids to be land applied? Identify each constituent and give their concentrations? Attach current and representative analysis of material to be land applied see Attachment B – Wastewater Characteristics Table
X	Other known constituents of concern (specify)? Attach current and representative analysis of material to be land applied see Attachment B

CROP TYPES

X	List all crop types grown or planned to be grown on the proposed land application site. Typical crops include alfalfa wheat, grass seed, onions, sweet corn, buckwheat, and canola (see Attachment C for a full list of potential crops)
X	Provide Oregon State University Fertilizer Guide for each crop type grown (Proposed to be grown) on the proposed land application site. Refer to Attachment C
X	List all supplemental fertilizers and/or soil amendments land applied on the proposed land application site(s). Attach name of material and loading in lbs/ac. See the Permit and current OMM Plan for information regarding application of supplemental fertilizers and/or soil amendments.

CROP GROWING SEASON/FARMER'S LAND APPLICATION SCHEDULE

X	When does the farmer want the material land applied for the crop types grown on the proposed land application site?
X	Give a typical land application schedule, what months of the year will the material be land applied (lbs/ac)?
X	Does the Farmer propose to harvest the crop? When and how will this happen on the proposed land application site?
X	What types of yield does the Farmer expect from the land application of the Industrial solid/liquid?
X	Do you plan on following up with the farmer to be see what yields (units/ac) were attained over the period that the land application of solids/liquids benefited the crop grown?

[Refer to the current Port OMM Plan for crop plan, growing seasons, land application schedules, crop harvest practices, expected yields.](#)

IRRIGATION OF RECLAIMED INDUSTRIAL LIQUIDS

THE IRRIGATION AREA WILL BE USED FOR THE FOLLOWING:

☒	Crops (specify types): Alfalfa, wheat, grass seed, onions, sweet corn, buckwheat, and canola (see Attachment C for a full list of potential crops)
☐	Pasture
☐	Forest
☐	Public access areas (specify types):
☐	Natural areas (specify species or mix):
☐	Other (specify):

LIQUID APPLICATION RATE	Yes	No
How will irrigation be controlled not to exceed the water consumption rate (in/ac) of the crop being grown?	*	
How will irrigation be controlled not to exceed the nutrient requirements of the crop being grown?	*	

*Wastewater application will be through center irrigation pivots. Tracking and control of wastewater applications will be through the crop and the field sampling procedures and data described in the Port's permit and OMM plan.

What is the proposed application rate of the reclaimed water? [refer to OMM Plan](#)
Acreage of irrigation site: [minimum of 5,330 acres of irrigated pivots are within the proposed expansion area.](#)

The months that irrigation will be permitted [Refer to Port Permit and OMM Plan](#)
If irrigation occurs at nighttime, will the public be restricted access to allow for sunlight contact on irrigated water? [refer to OMM Plan](#) ____
If so, specify length of time _____

TRANSPORT LINE/PIPES	Yes	No
At the end of the irrigation day, will the transport lines/pipes be drained back to the wastewater treatment facility?		☒
Is there a gate/ball shut off valve at the irrigation pump?	☒	
Is there an in line pressure relief valve to by pass reuse water back into the source basin if there is a line transmission plug?		☒
At the cessation of the irrigation season, will the transport lines/pipes be flushed and cleaned?		☒
Is there a gate/ball shut off valve at the irrigation field, or at each irrigation zone?	☒	

*system pressure is instantly controlled by pressure transducers and VFD controller set to a specific pressure.

ZONED LAND USE OF IRRIGATION SITE

☒	Exclusive Farm Use	☐	Industrial
☐	Forestry	☐	State/Federal lands
☐	Rural Residential	☐	Other (Specify):

ZONED LAND USE OF AREA AROUND IRRIGATION SITE

☒	Exclusive Farm Use		Industrial
	Forestry		State/Federal lands
	Rural Residential		Other (Specify):

Prevailing wind direction during irrigation season (specify generally from the west)
 Will irrigation be restricted when winds exceed 10 MPH? No

THE NEAREST DEVELOPED PROPERTY FROM (ft):

(Irrigated Ag Pivots Or CAFO present immediately surrounding Farm 6 Expansion Site)

North boundary: potential farm worker/residential house ~ 200' from north of expansion area boundary
South boundary: residential house ~ 4,000 feet from south expansion boundary; Finnley Butte Landfill is located SW of site ~ 1 mile; potential farm worker/residential house in section 27
East boundary: potential farm worker/residential house ~ 200' from northeast corner of expansion area boundary at section 23, no other within 1 mile of boundary
West boundary: irrigation pivots for ~ 1.75 miles from western edge of expansion area boundary, followed by the Navy bombing range
What is the nearest developed property downwind of irrigation site (specify type and distance): Unknown – expansion area surrounded by other agricultural land
Are there any playgrounds, schools, or public parks within ½ mile of irrigation site? (specify): No

DOMESTIC WELLS	Yes	No
Are there any domestic wells located within the irrigation site?	☒	
If yes, within 100 feet?		

*= all domestic wells within the Farm 6 boundary are completed in the basalt aquifer located beneath (and not connected to) the shallow alluvial aquifer present at the Farm 6 site.

POTENTIAL RUN-OFF POINTS ARE LOCATED AT THE:

	North boundary (specify): No runoff expected to the north (see discussion below about NE corner of Farm 6) (refer to Figure 3)
	South boundary (specify): No runoff expected to the South (refer to Figure 3)
☒	East boundary (specify): Pipe failure at one of the pivots in Section 14 or 23 could result in runoff along NE portion of Section 14 (where the Sand Hollow feature crosses the Farm 6 boundary; Section 14) (refer to Figure 3).
☒	West boundary (specify): Pipe failure at one of the pivots in Section 17 could result in runoff along western portion of Section 17, otherwise no potential runoff is expected to the West (refer to Figure 3)

PUBLIC ACCESS WILL BE CONTROLLED BY THE FOLLOWING:

	No trespassing or warning signs (specify spacing):
	Fencing (specify type):
☒	Other (specify): Signage and private roadways to site with limited access

BARRIERS ON BOUNDARIES THAT MAY MITIGATE AEROSOL DRIFT

Natural vegetation (specify height and width):
Natural topography (specify): site has significant topographic relief (steep ravines)

Tree or fence row (specify height):
Other (specify):
None:

IRRIGATION METHOD

Set sprinkler heads with spray height of _____ and spray diameter of _____
Wheel irrigation line with spray height of _____ and spray diameter of _____
Big gun irrigation with spray height of _____ and spray diameter of _____
Other (specify): pivot irrigation – multiple pivots

IRRIGATION EQUIPMENT SPECIFICATIONS (insert more rows as needed)

Sprinkler head types (brand and model)	Irrigation zones/cells	PSI operating ranges
Current pivots include either Valley 8000 series poly lined pivots with a sprinkler package that can apply 7.5 gpm/acre or equivalent package from alternative manufacturer		

REQUIRED ATTACHEMENTS:

1. Overhead scale diagram/plan view of the wastewater treatment plant that identifies the treatment and disinfection components of the plant.
2. Overhead scale diagram/plan view of the transport line from wastewater treatment plant to the irrigation area.
3. Overhead scale diagram/plan of the irrigation site showing surrounding properties and irrigation system layout.

Table:

[Table 1 Farm 6 Expansion Project – Circle Nos. and Acres](#)

Figures:

- [Figure 1 - Farm 6 Expansion Project - Vicinity Map](#)
[Figure 2 - Farm 6 Expansion Project – Proposed Expansion Boundary, Irrigation Circles, and Monitoring Wells](#)
[Figure 3 - Farm 6 Expansion Project – Surface Topography](#)
[Figure 4 - Farm 6 Expansion Project – General Soil Types](#)
[Figure 5 - Farm 6 Expansion Project – Predominant Soil Drainage Class Map](#)
[Figure 6 - Farm 6 Expansion Project – Geology and Structure Map](#)
[Figure 7 - Farm 6 Expansion Project – Irrigation Piping System](#)
[Figure 8 - Farm 6 Expansion Project – Wastewater Piping System](#)

Attachments:

- [Attachment A – Farm 6 Expansion Project -Tax Lot Table and Map](#)
[Attachment B – Wastewater Quality Table](#)
[Attachment C – Current Port/Oregon State University Fertilizer Guide](#)
[Attachment D – Project Area Soil Map and Soil Classification Descriptions](#)
[Attachment E – Groundwater Monitoring Network](#)
[Attachment F – Adjacent Water Well Survey](#)
[Attachment G – DEQ Land Use Compatibility Approval – Morrow County](#)
[Attachment H – Purchase and Sales Agreement for Farm 6](#)

DEQ REVIEW COMMENTS:

Table 1**Farm 6 - Land Application Expansion Project*****Properties contracted to be purchased from Canyon Farms, LLC, and Canyon Farms II, LLC*****Port of Morrow**

Port Farm 6 Field #	Acres
601	112
602	61
603	49
604	61
605	130
606	121
607	117
608	123
609	118
610	112
611	117
612	52
613	110
614	118
615	126
616	119
617	119
618	119
619	115
620	131
621	118
622	112
623	117
624	116
625	114
626	56
627	119
628	119
629	119
630	18
631	139
632	128
633	123
634	122
635	121
636	112
637	71
638	176
639	112
640	121
641	121
642	60
643	121
644	122
645	118
646	118
647	89
648	118
649	118
Total Acres =	5348

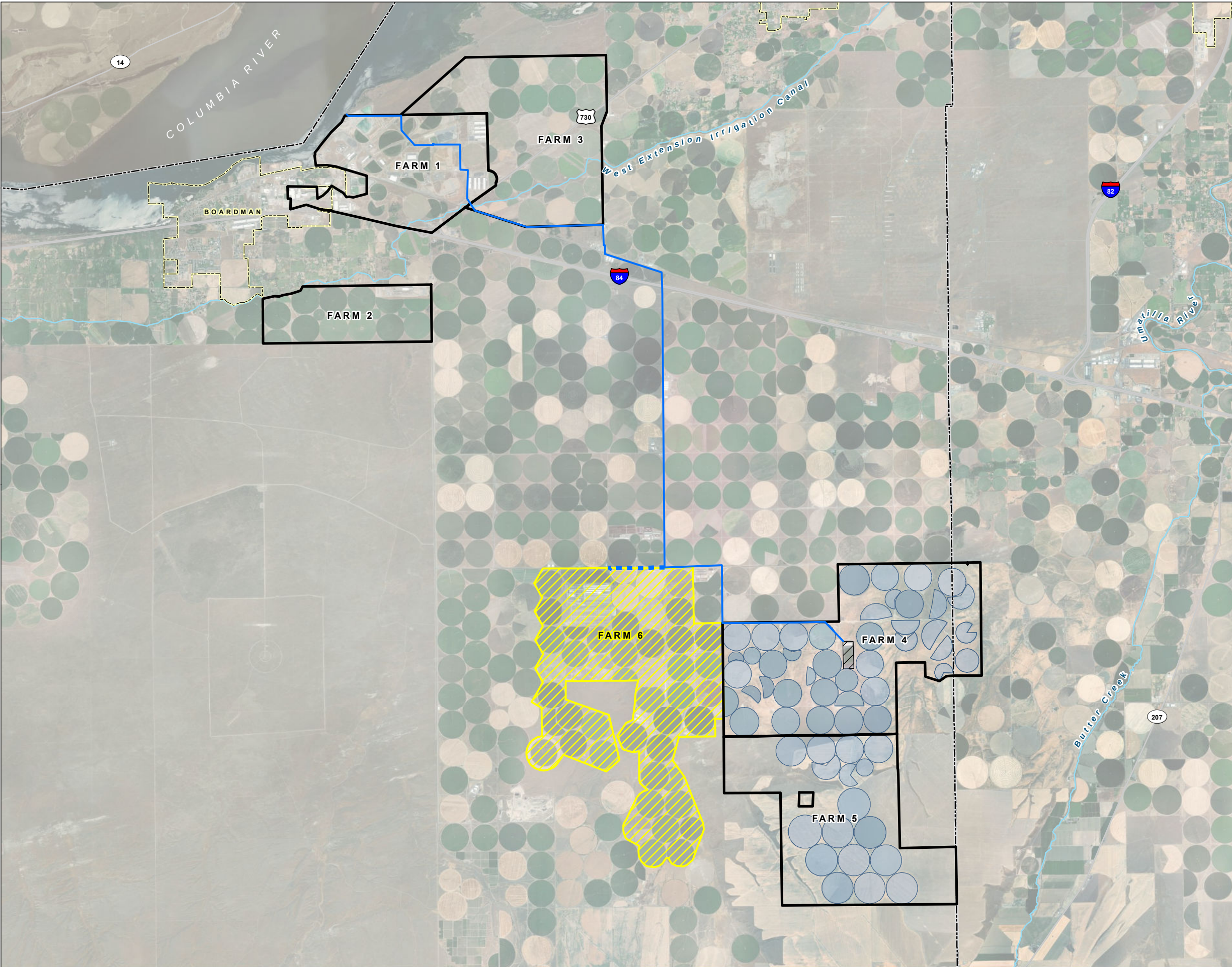


FIGURE 1

Vicinity Map

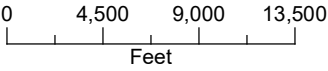
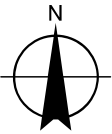
Farm 6 - Land Application
Program Expansion
Port of Morrow (POM)

LEGEND

- Proposed New Pipeline
- Existing Pipeline
- Farm 6 Expansion
- POM Existing WPCF Permit Boundary
- Existing Land Application Irrigation Circle
- Existing Process Water Storage Pond

All Other Features

- City Boundary
- County Boundary
- Major Road
- Watercourse



Date: September 4, 2024
Data Sources: BLM, ESRI, ODOT, USGS,
NAIP Imagery (2020), POM



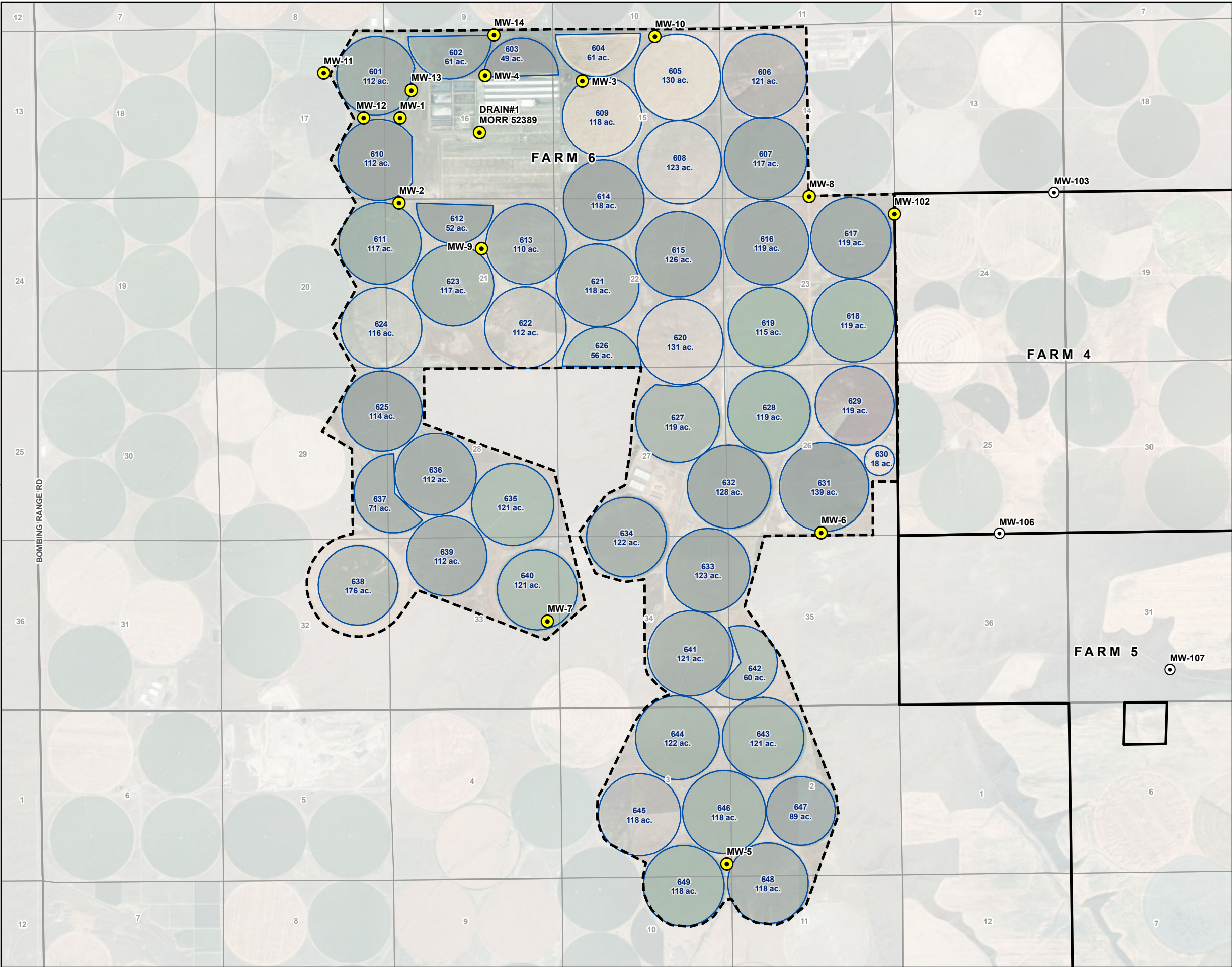
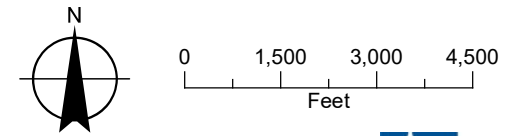


FIGURE 2
Proposed Expansion Project
Boundary, Irrigation Circles,
and Monitoring Wells
Farm 6 - Land Application
Program Expansion
Port of Morrow (POM)

- LEGEND**
- Farm 6 Monitoring Well
 - Monitoring Well
 - Farm 6 Proposed WPCF Boundary Expansion
 - POM Existing WPCF Permit Boundary
 - Existing Irrigation Circle



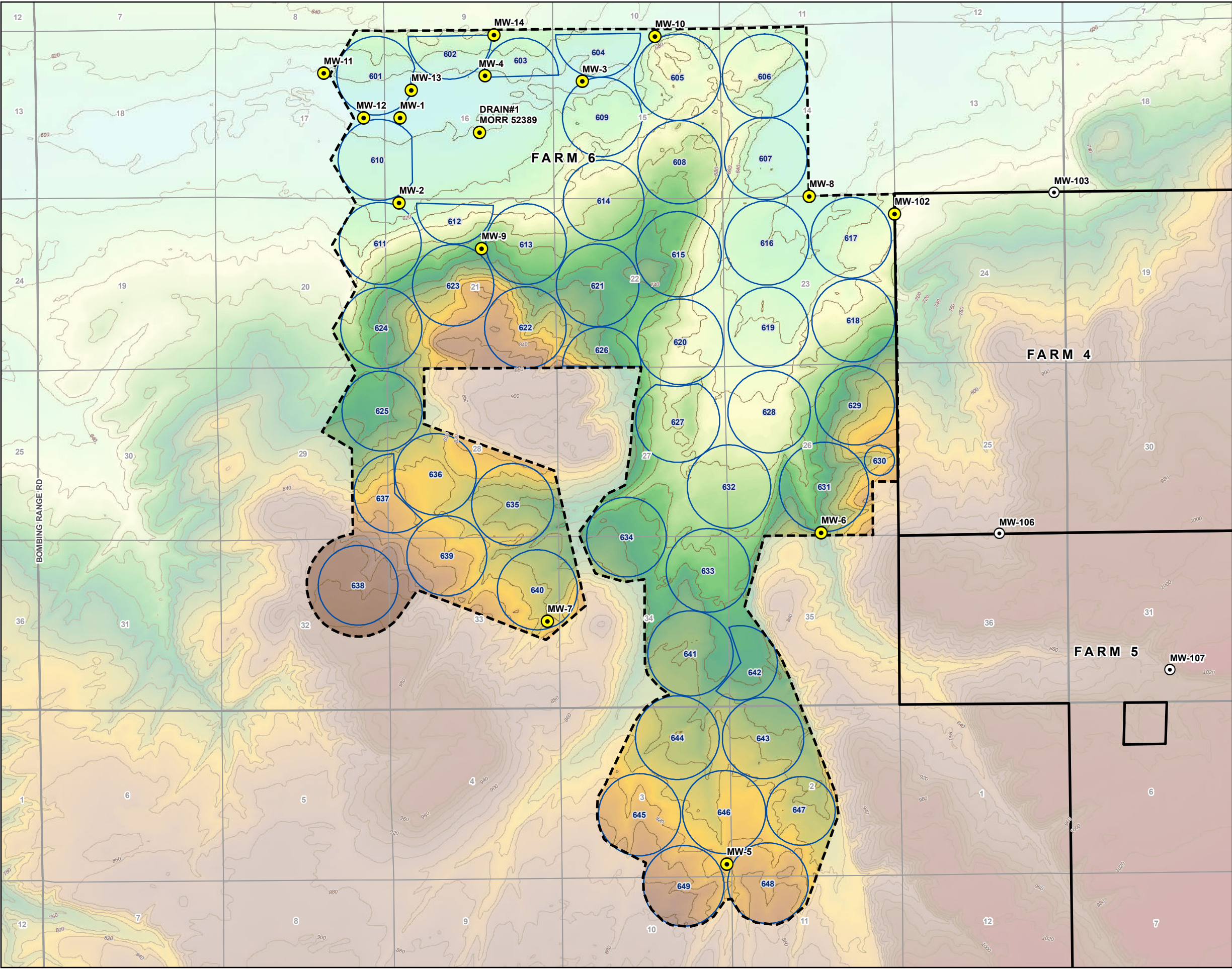


FIGURE 3

Surface Topography

Farm 6 - Land Application
Program Expansion
Port of Morrow (POM)

LEGEND

- Farm 6 Monitoring Well
- Monitoring Well
- Farm 6 Proposed WPCF Boundary Expansion
- POM Existing WPCF Permit Boundary
- Existing Irrigation Circle
- Surface Elevation Contour (20 foot interval)

Surface Elevation (feet)

High : 318.133

Low : 177.433

0 1,500 3,000 4,500

Feet

Date: September 4, 2024

Data Sources: DOGAMI, USGS, ESRI

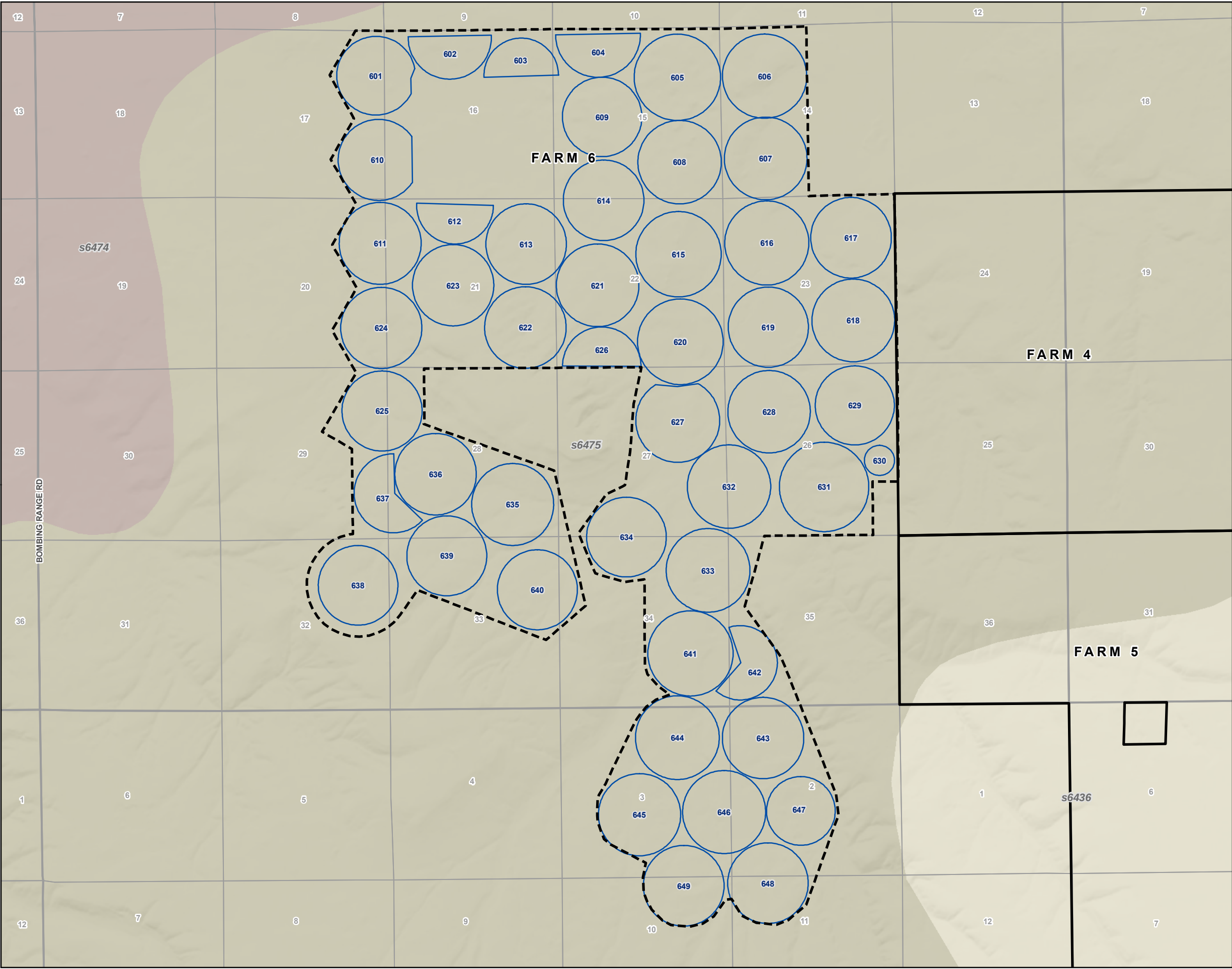


FIGURE 4

General Soil Map

Farm 6 - Land Application
Program Expansion
Port of Morrow (POM)

LEGEND

- Farm 6 Proposed WPCF Boundary Expansion
- POM Existing WPCF Permit Boundary
- Existing Irrigation Circle

General Soil Types

- Ritzville-Mikkalo (s6436)
- Sagehill-Quincy-Koehler (S6474)
- Warden-Sagehill-Taunton (s6475)

N

0 1,500 3,000 4,500
Feet

Date: September 4, 2024
Data Sources: DOGAMI, USGS, ESRI

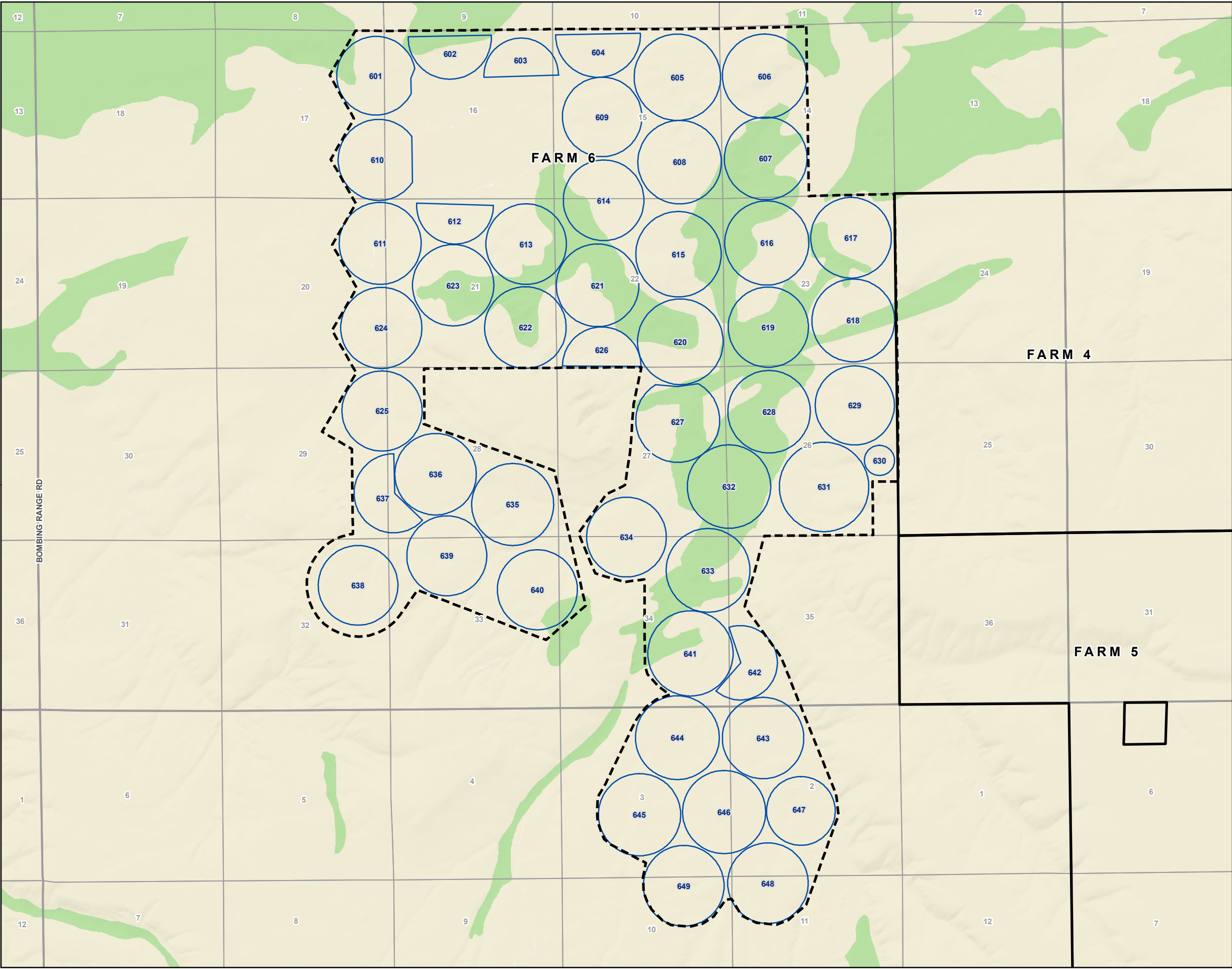


FIGURE 5
Soils - Predominant Drainage Class
Farm 6 - Land Application
Program Expansion
Port of Morrow (POM)

LEGEND

- Farm 6 Proposed WPCF Boundary Expansion
- POM Existing WPCF Permit Boundary
- Existing Irrigation Circle

Soils - Predominant Drainage Class

- Excessively drained
- Well drained
- Poorly drained

N

0 1,500 3,000 4,500
Feet

Date: September 4, 2024
Data Sources: DOGAMI, USGS, ESRI

GSI
Water Solutions, Inc.

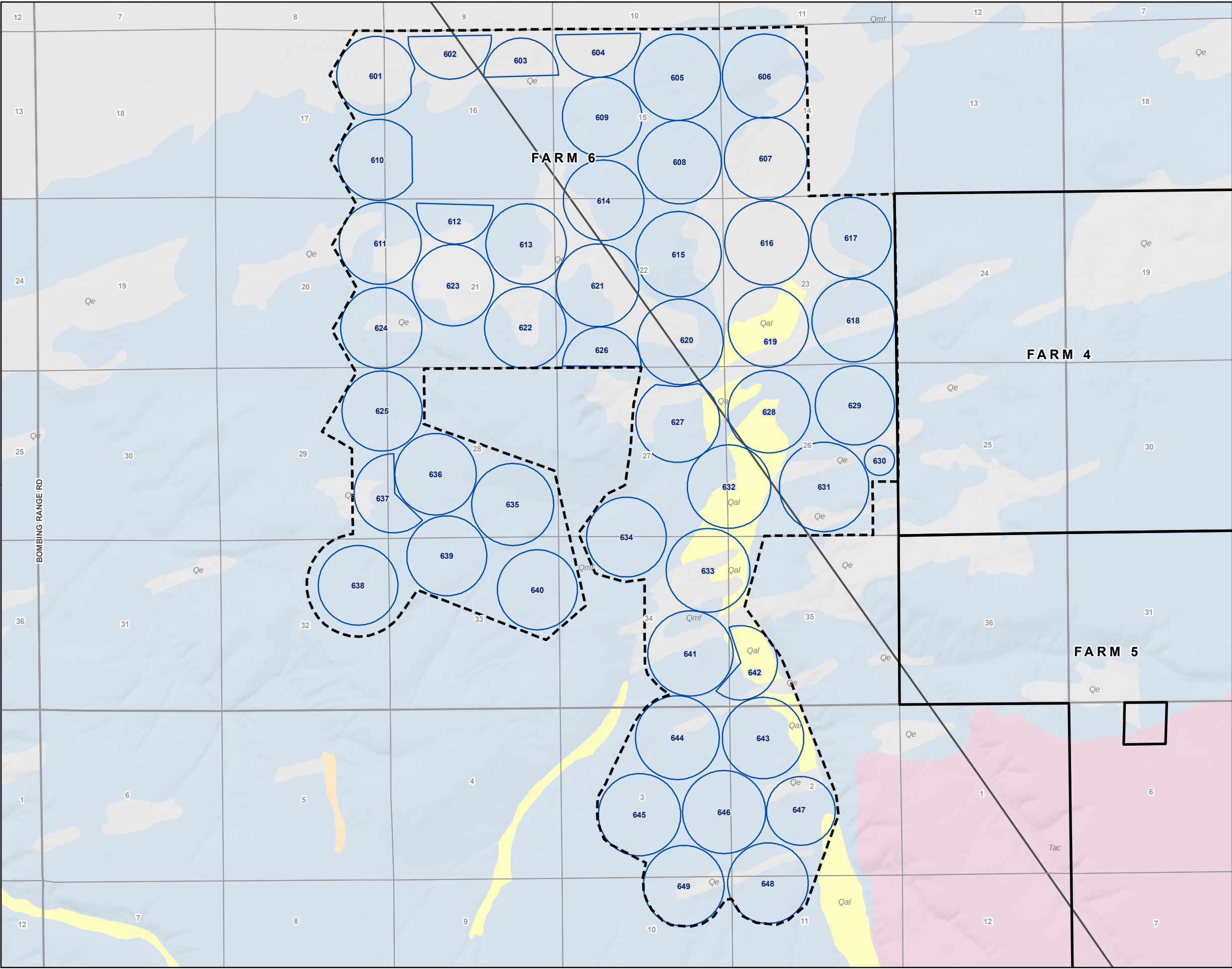
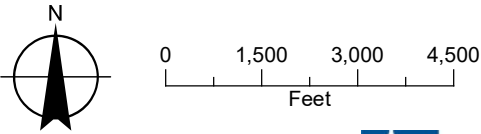


FIGURE 6
Geologic and Structural Map
Farm 6 - Land Application
Program Expansion
Port of Morrow (POM)

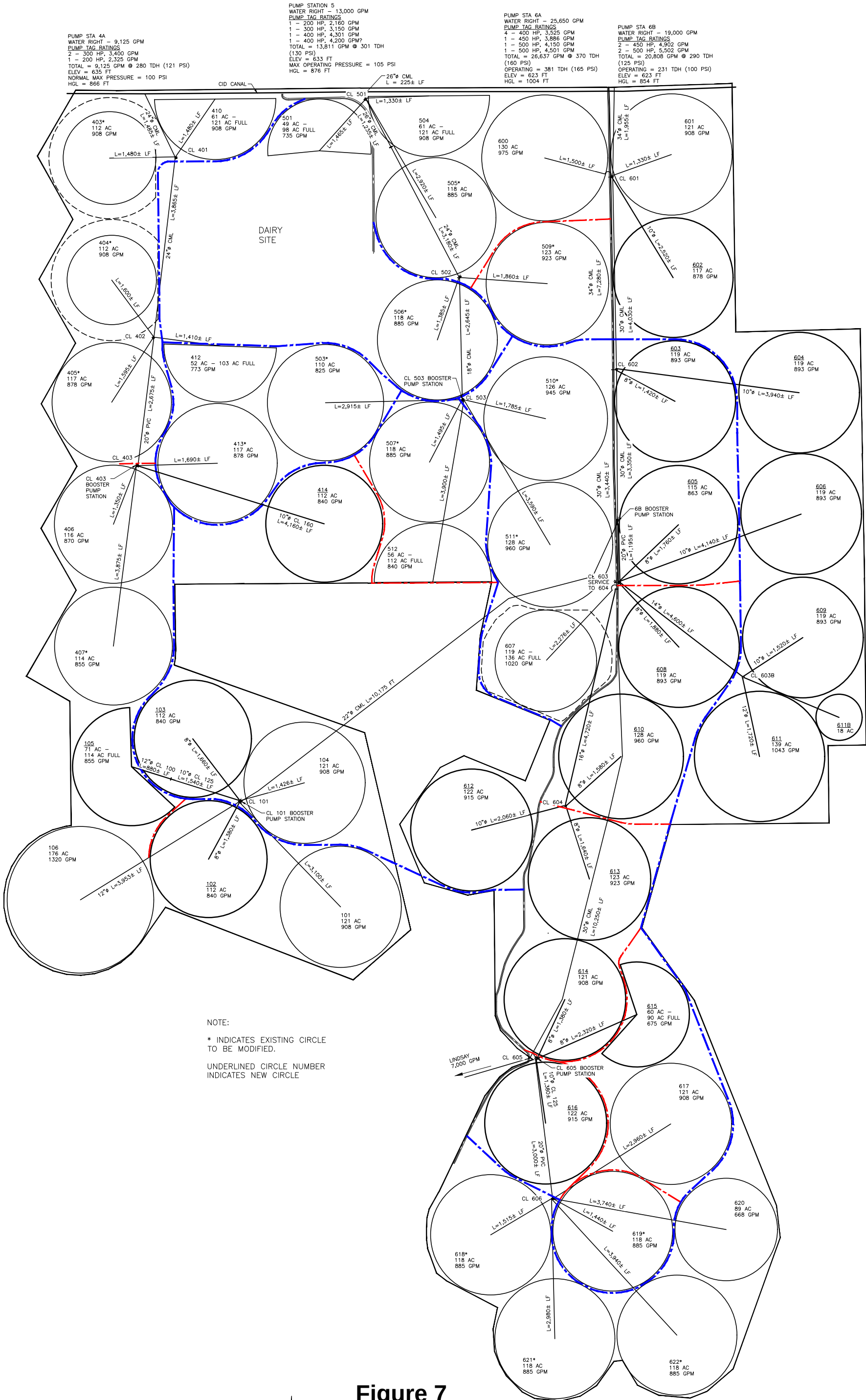
- LEGEND**
- Farm 6 Proposed WPCF Boundary Expansion
 - POM Existing WPCF Permit Boundary
 - Existing Irrigation Circle
 - Surficial Geology**
 - Fault, Normal
 - Qal: Alluvium
 - Qe: Eolian sand and ash
 - Qf: Alluvial fan deposits
 - Qmf: Missoula Flood deposits
 - Tac: Alkali Canyon Formation



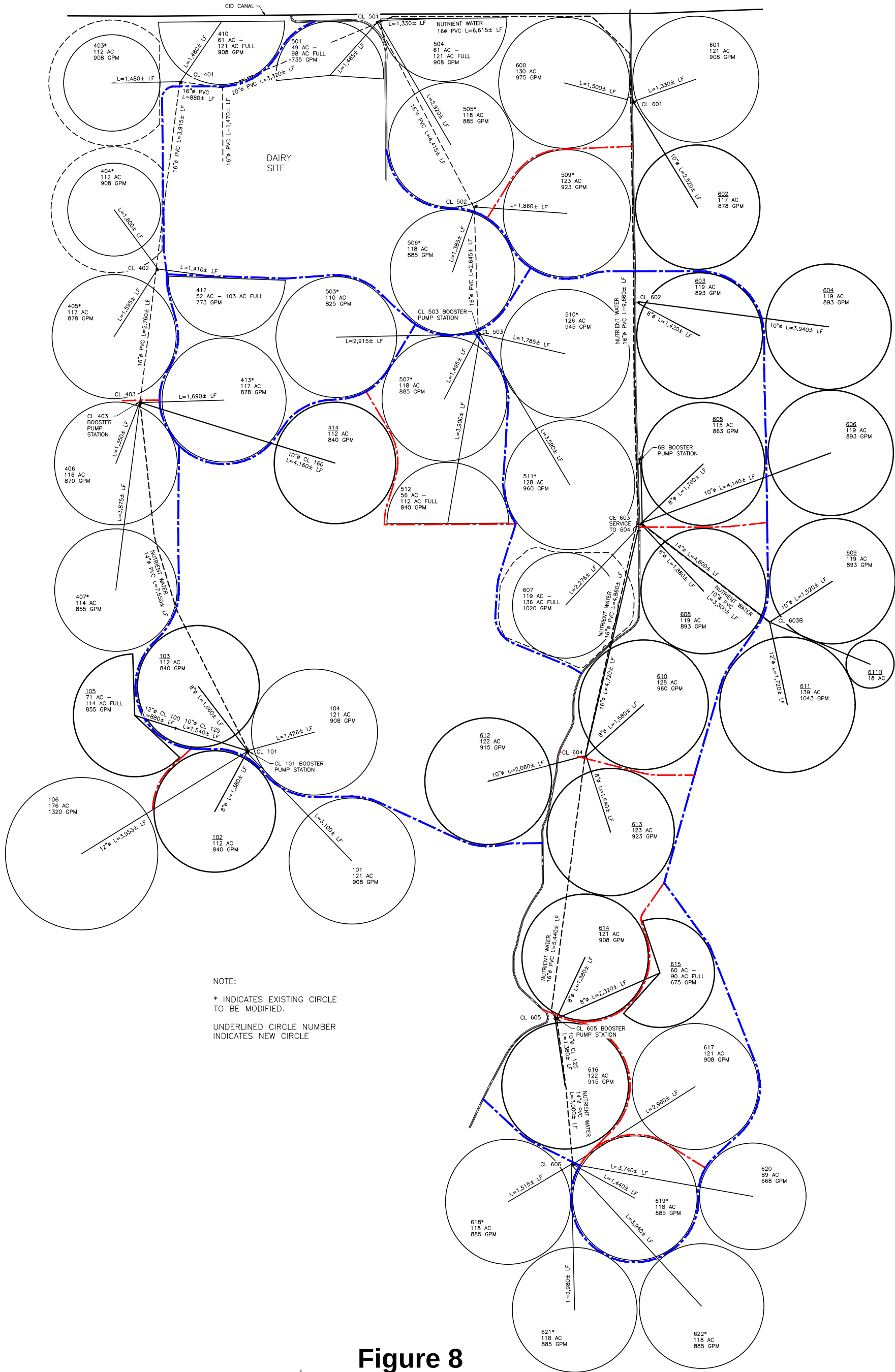
Date: September 4, 2024
Data Sources: DOGAMI, USGS, ESRI



IRRIGATION PIPING SYSTEM MAP



WASTEWATER PIPING SYSTEM MAP



ATTACHMENT A

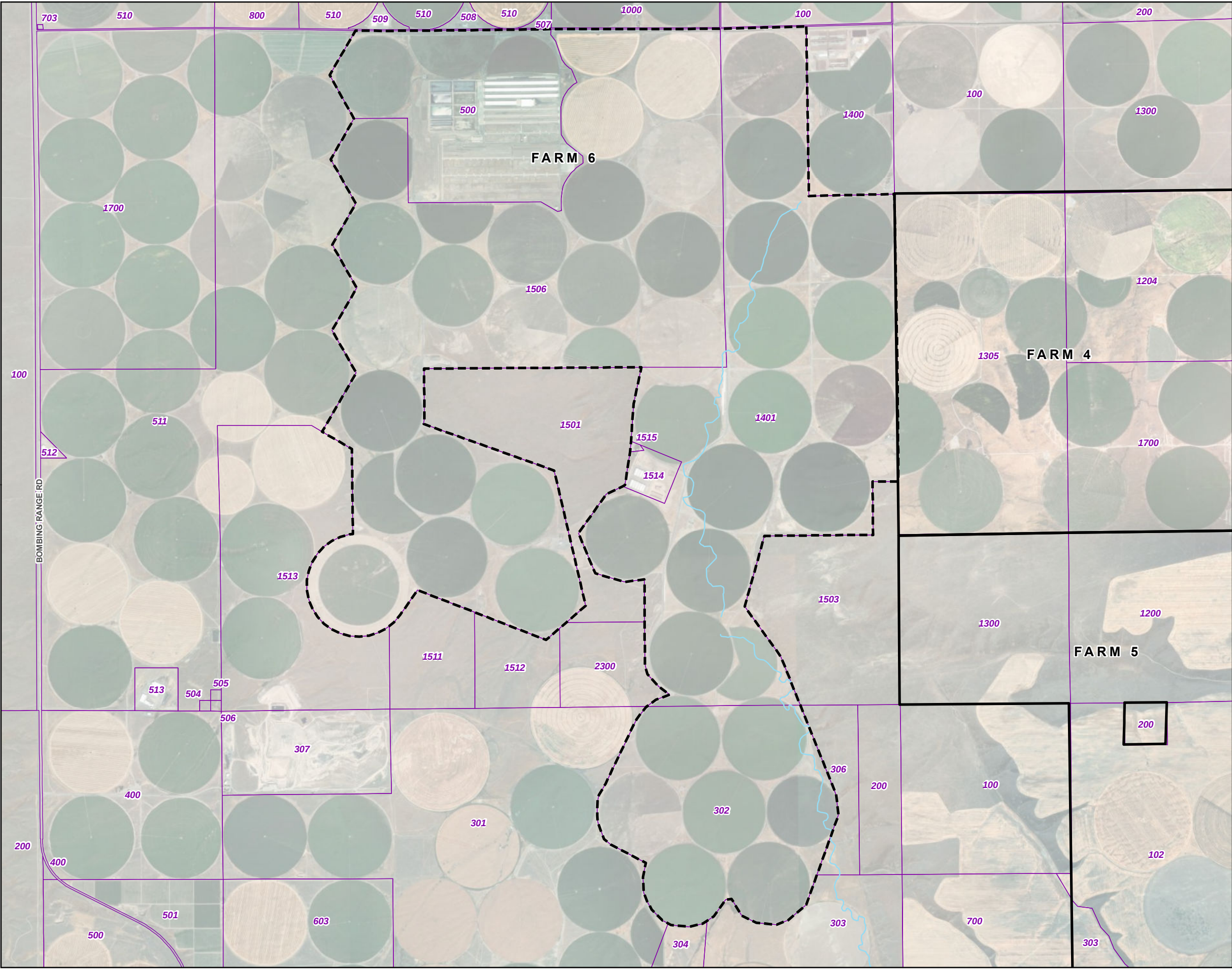
Farm 6 – Expansion Project Tax Lot Table and Map

Tax Lots

Port of Morrow WPCF Permit Modification

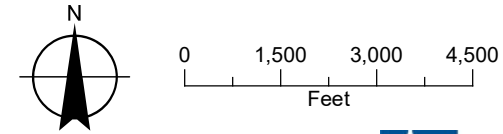
Farm 6 Tax Lots & Current Ownership Pending Purchase by Port of Morrow

Township		Range		Section	Tax Lot #	County	Land Owner
3	N	26	E	15, 16, 17	500	Morrow	Canyon Farm, LLC
3	N	26	E	14, 23, 26, 27, 34, 35	1401	Morrow	Canyon Farm II, LLC
3	N	26	E	15, 16, 17, 20-22, 28, 29, 32-34	1506	Morrow	Canyon Farm II, LLC
3	N	26	E	27	1514	Morrow	Canyon Farm II, LLC
3	N	26	E	27	1515	Morrow	Canyon Farm II, LLC
2	N	26	E	2, 3, 10, 11	302	Morrow	Canyon Farm II, LLC



Farm 6 Tax Lot Map
Farm 6 - Land Application
Program Expansion
Port of Morrow (POM)

- LEGEND**
- Morrow County Tax Lot
 - Farm 6 Land Application Boundary
 - POM Existing Land Application Boundary



ATTACHMENT B

**Farm 6 - Expansion Project
Wastewater Characterization Table**

Attachment B Table
Average Wastewater Quality from 2019 to 2024

Influent Wastewater (to Port of Morrow)	pH	Conductivity (microsiemens /centimeter)	Temperature (degrees Celsius)	NH ₃ -N/ NH ₄ -N (mg/L)	NO ₃ (mg/L)	TDS (mg/L)	TKN(mg/L)	TSS (mg/L)	# Samples	Sample Collection Period of record
Boardman Foods	7.3	645.9	19.0	7.9	3.9	831.1	56.1	285.2	49	Jan 2019-Aug 2023
Calbee North America	8.1	732.3	19.1	6.4	5.6	590.6	51.9	756.4	48	Jan 2019-Nov 2022
Tillamook	10.8	1085.4	27.1	4.6	24.2	1182.2	110.1	545.8	46	Jan 2019-Sep 2023
Lamb Weston West	5.9	1099.9	30.1	39.8	2.5	503.2	106.2	467.6	47	Jan 2019-Sep 2023
Lamb Weston East	5.8	1025.8	32.5	33.4	0.0	654.6	103.4	1209.5	39	Jan 2019-Sep 2023
JSH Farms ^(a)	-	-	-	-	-	-	-	-	-	-
Oregon Potato	6.6	1327.5	33.8	19.5	0.9	980.6	192.5	2186.8	39	Jan 2019-Aug 2023
Pacific Ethanol (Alto)	6.9	994.4	22.5	2.7	8.9	355.5	28.0	236.2	44	Jan 2019-Aug 2023
PGE Coyote Springs	7.8	822.0	18.4	0.0	32.1	1651.3	1.0	18.5	10	Dec 2022-Oct 2022
Morrow Cold Storage ^(b)	-	-	-	-	-	-	-	-	-	-
Zechem ^(a)	-	-	-	-	-	-	-	-	-	-
PDX 62	8.2	629.9	16.9	0.0	6.4	773.3	0.3	3.9	3	Oct 2021-Oct 2023
PDX 90	8.5	347.4	16.4	0.0	4.1	392.7	0.2	0.0	3	Oct 2021-Oct 2023
PDX 109	8.2	377.9	18.7	0.0	6.1	247.0	0.3	6.0	2	Oct 2022-Oct 2023
PDX 178 ^(a)	-	-	-	-	-	-	-	-	-	-
VA Data #1	8.2	644.4	20.0	0.0	12.1	350.7	0.4	1.4	3	Oct 2021-Oct 2023
VA Data #4	8.18	385.75	21.5	0.0	39.7	630.0	0.2	9.0	3	Oct 2021-Oct 2023
Effluent Wastewater (to Farmers)										
South Lift Station	8.6	1421.0	37.3	28.2	0.6	1317.3	90.7	1045.3	260	Jan 2019-Mar 2024
North Lift Station	8.9	1195.7	23.1	9.5	16.7	2201.1	89.9	595.7	260	Jan 2019-Mar 2024
Pond #41 Lagoon	6.8	1247.8	18.8	76.8	0.8	1422.9	102.9	266.5	249	Jan 2019-Mar 2024
Sand Dune Lagoon	7.3	1216.6	20.1	73.5	0.1	1304.4	90.9	196.0	229	Jan 2019-Feb 2024

NH₃-N = ammonia-nitrogen, NH₄-N = ammonium-nitrogen, NO₃-N = nitrate-nitrogen, TDS = total dissolved solids, TKN = total Kjeldahl nitrogen, TSS = total suspended solids

a. Facilities are not currently discharging and did not discharge during the period of record.

b. A sampling location is being identified for the facility and therefore data has not yet been collected.

ATTACHMENT C

Farm 6 – Expansion Project
Current Port OMM Plan Fertilizer Guide

Crop List and Agronomic Loading Rates

Crop	Rooting Depth	DEQ Approved Agronomic Rate (lb N/ac)	Growing Season	Target Yield	Animal Feed, Human Consumption, or Other	Sources
Alfalfa, Hay	5	250 for < 6 tons/ac 450 for 6-8 tons/ac	Oct-31 to Oct-01 (Year Round)	6-10 tons/ac	Animal Feed	USDA 2010; Koenig et al. 2009;
Alfalfa, Mix	5	300	Oct-31 to Oct-01 (Year Round)	7 tons/ac	Animal Feed	USDA 2010 ; USDA NRCS 2022
Alfalfa, Seed	5	200	Feb-01 to Aug-31	720 lb/ac	Seed	Koenig et al. 2009; OSU 2022b
Arugula	3	125	Apr-01 to May-31	800-1000 cartons/ac	Human Consumption	OSU 2010a
Barley, Spring	5	100	Mar-30 to Sep-1	160 bu/ac	Animal Feed	USDA 2010; Robertson and Stark 2003
Barley, Fall	5	300	Oct-01 to Jul-31	160 bu/ac	Animal Feed	Verhoeven et al. 2019; Brown 1997
Barley/Pea	5	240			Human Consumption	
Beans, Dry	2	150 for 20 cwt/ac	May-01 to Oct-31	20-50 cwt/acre	Human Consumption	Moore et al. 2012
Beans, Green	4	150	May-01 to Sep-30	100 cwt/ac	Human Consumption	USDA 2010; Heinrich et al. 2016 ;OSU 2010c
Beans, Lima	4	150	May-15 to Sep-30	3000 lb/ac	Human Consumption	OSU 2010b; Moore et al. 2012
Perennial Bluegrass, seed	3	170	Feb-01 to Sep-01	2400 lb/ac	Seed	Affeldt et al. 2011
Annual Bluegrass, Seed	2	170	Aug-15 to July-01	2400 lb/ac	Seed	
Buckwheat	3	160	Jul-01 to Oct-31	1900 lb/ac	Seed	Pavek 2016; Gardner, Jackson, et al. 2000a
Canola, Winter	5	250	Aug-01 to July-31	4000 lb/ac	Seed	Wysocki et al. 2007; Ehrensing 2008
Carrot, Seed	4	200	Mar-15 to Sep-30	500 lb/ac	Seed	Hart and Butler 2004
Corn, Grain	5	350	Apr-01 to Dec-31	280 bu/ac	Animal Feed	Brown et al. 2010; Gardner, Hall, et al. 2000; USDA 2010
Corn, Sweet	5	290	Jul-15 to Nov-30	11 tons/ac	Human Consumption	OSU 2010d; Gardner, Mansour, et al. 2000
Corn/Sorghum	5	340	Apr-01 to Dec-15	40 tons/ac	Animal Feed	Brown et al. 2010; USDA 2010
Forage Mix	5	200	Feb-01 to Oct-31	6-8 tons/ac	Animal Feed	Hart et al. 2000; Shewmaker et al. 2009
Garlic	1	250	Oct-01 to Jul-31	5000-17000 lb/ac	Human Consumption	OSU 2010e
Grass Forage (Pasture)	3	300 ¹	Oct-31 to Oct-01 (Year Round)	6-8 tons/ac	Animal Feed	Moore, Wysocki, et al. 2019; Moore, Pirelli, et al. 2019; Shewmaker et al. 2009, Hendrix n.d.; Barnhart et al. 2013
Grass Sudan	4	160	Mar-31 to May-15	3-6 tons/ac	Animal Feed	Armah-Agyeman 2002
Mustard	3	100	Aug-01 to Apr-01	1500 lb/ac	Other	Wysocki and Corp 2002
Onions, dehydrated	1	280	Apr-01 to Oct-31	15-25 tons/ac	Human Consumption	Sullivan et al. 2001; OSU 2010g
Onions, fresh	1	320	Mar-15 to Nov-30	40-45 tons/ac	Human Consumption	Sullivan et al. 2001; OSU 2010f
Orchard Grass, Hay	3	300	Oct-31 to Oct-01 (Year Round)	6-7 dry tons/ac	Animal Feed	Kugler 2006; Hart et al. 2000; Hannaway 1999
Peas, Green	2	150	Feb-01 to Sep-30	2 dry tons/ac	Human Consumption	Kaiser et al. 2016; USDA NRCS 2022; Cascade Earth Sciences 2016
Peas, Seed	2	150	Feb-01 to Sep-30	2 dry tons/ac	Human Consumption	Kaiser et al. 2016; USDA NRCS 2022; Cascade Earth Sciences 2016
Peas, Sugar Snap	2	150	Feb-01 to Sep-30	2 dry tons/ac	Human Consumption	Kaiser et al. 2016; USDA NRCS 2022; Cascade Earth Sciences 2016
Potatoes	2	340	Mar-15 to Nov-15	37.5 tons/ac	Human Consumption	Lang et al. 1999; Stark et al. 2004
Potatoes, Early	2	240	Mar-15 to Jul 01	24 tons/ac	Human Consumption	Lang et al. 1999; Gardner et al. 1985

Crop List and Agronomic Loading Rates

Crop	Rooting Depth	DEQ Approved Agronomic Rate (lb N/ac)	Growing Season	Target Yield	Animal Feed, Human Consumption, or Other	Sources
Potatoes, Sweet	2	100	May-01 to Oct-31	125-250 cwt/ac	Human Consumption	OSU 2010i
Perennial Ryegrass, Seed	5	225	Feb-01 to Oct-31	2800 lb/ac	Seed	Hart et al. 2013; Hart, Mellbye, et al. 2011
Annual Ryegrass, Seed	3	225	Sep-15 to Aug-01	2800 lb/ac	Seed	
Sunflower	2	130	May-01 to Sep-30	2400 lbs/ac	Animal Feed	Murphy 1978; Mortvedt et al. 2003
Tall Fescue, Seed	3	225	Oct-31 to Oct-01 (Year Round)	2000 lbs/ac	Seed	Gingrich 2003; Ralston 2009
Tillage Radish, seed	1	150	Mar-15 to Oct-31	15-20 tons/ac	Seed	OSU 2010h; Navazio 2007; Jacobs 2012
Perennial Timothy	3	190	Oct-31 to Oct-01 (Year Round)	5 tons/ac	Animal Feed	Norberg 2016; USDA 2010; Esser 1993; McKenzie et al. 2009
Annual Timothy	2	190	Sep-01 to May-15	3-4 tons/ac	Animal Feed	
Triticale	5	310	Aug-15 to May-01	5 dry tons/ac	Animal Feed	Marsalis 2018; Sattell et al. 1998
Turnips	1	75	Apr-01 to Jun-30	150 cwt/ac	Animal Feed	OSU 2010j
Wheat, DNS	5	310	Aug-31 to Jul-01	130 bu/ac	Human Consumption	Flowers et al. 2007; James and Johnson 1980
Wheat, Hard Red Winter	5	365	Sep-31 to Sep-01	170 bu/ac	Human Consumption	Flowers et al. 2007
Wheat, Soft White Spring	5	200	Feb-01 to Aug-31	120 bu/acre	Human Consumption	James and Johnson 1980; Horneck et al. 2010
Wheat, Soft White Winter	5	300	Sep-30 to Sep-01	160 bu/ac	Human Consumption	Horneck et al. 2010; Gardner, Jackson, et al. 2000b

1. See *Nitrogen Accounting Method for Grazing of Land Application Sites* (LPI 2023) for livestock-based agronomic rates.

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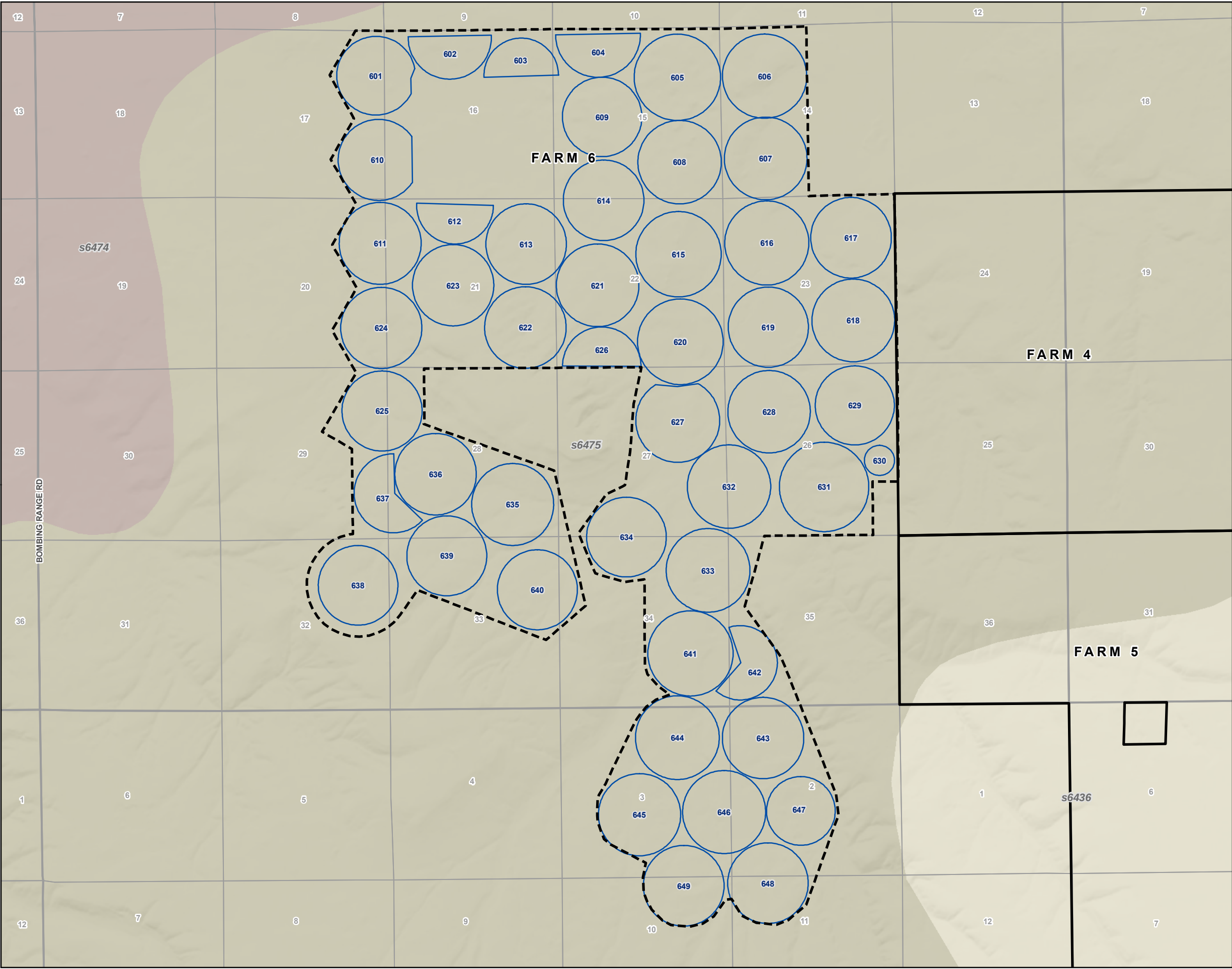
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ATTACHMENT D

Farm 6 – Expansion Project Soils Map & Soils Description



FIGURE

General Soil Map

Farm 6 - Land Application
Program Expansion
Port of Morrow (POM)

LEGEND

- Farm 6 Proposed WPCF Boundary Expansion
- POM Existing WPCF Permit Boundary
- Existing Irrigation Circle

General Soil Types

- Ritzville-Mikkalo (s6436)
- Sagehill-Quincy-Koehler (S6474)
- Warden-Sagehill-Taunton (s6475)

N

0 1,500 3,000 4,500
Feet

Date: September 4, 2024
Data Sources: DOGAMI, USGS, ESRI

LOCATION SAGEHILL

WA+OR

Established Series

Rev. HRG/RJE/TLA/RWL

09/2019

SAGEHILL SERIES

Landscape--valleys

Landform--terraces, terrace escarpments

Slope--0 to 60 percent

Parent material--lacustrine deposits with a mantle of loess or eolian deposits

Mean annual precipitation--about 180 mm

Mean annual air temperature--about 10 degrees C

Depth class--very deep, deep

Drainage class--well drained

Soil moisture regime--aridic

Soil temperature regime--mesic

Soil moisture subclass--xeric

TAXONOMIC CLASS: Coarse-loamy, mixed, superactive, mesic Xeric Haplocalcids**TYPICAL PEDON:** Sagehill very fine sandy loam, cultivated (All textures are apparent field textures.)

Ap--0 to 20 cm; very fine sandy loam, brown (10YR 5/3) dry, dark brown (10YR 3/3) moist; very weak fine granular structure; soft, very friable, nonsticky and nonplastic; common very fine roots; many very fine and fine irregular pores; slightly alkaline (pH 7.6); abrupt smooth boundary

Bw--20 to 48 cm; very fine sandy loam, brown (10YR 5/3) dry, dark brown (10YR 3/3) moist; weak very coarse prismatic structure; soft, very friable, nonsticky and nonplastic; common very fine roots; many very fine and fine irregular pores; slightly alkaline (pH 7.8); abrupt wavy boundary

2Bk1--48 to 76 cm; very fine sandy loam, pale brown (10YR 6/3) dry, grayish brown (2.5Y 5/2) moist; weak very coarse prismatic structure; slightly hard, friable, nonsticky and nonplastic; common very fine roots; common very fine and fine irregular pores; few spheroidal secondary lime aggregates; strongly effervescent; moderately alkaline (pH 8.4); abrupt wavy boundary

2Bk2--76 to 99 cm; silt loam, light brownish gray (2.5Y 6/2) dry, grayish brown (2.5Y 5/2) moist; massive; hard, firm, slightly sticky and slightly plastic; few very fine roots; common very fine and fine irregular pores; secondary lime in seams; violently effervescent; moderately alkaline (pH 8.4); abrupt wavy boundary

2Bk3--99 to 132 cm; very fine sandy loam, light brownish gray (2.5Y 6/2) dry, grayish brown (2.5Y 5/2) moist, massive; slightly hard, friable, nonsticky and nonplastic; few very fine roots; common very fine irregular pores; common secondary lime aggregates; violently effervescent; strongly alkaline (pH 8.6); abrupt smooth boundary

2Bk4--132 to 150 cm; very fine sandy loam, light brownish gray (2.5Y 6/2) dry, grayish brown (2.5Y 5/2) moist; massive; slightly hard, friable, nonsticky and nonplastic; few very fine roots; common very fine irregular pores; few spheroidal secondary lime aggregates; strongly effervescent; strongly alkaline (pH 8.6)

TYPE LOCATION: Grant County, Washington; about 3 km north of Warden; 770 m north and 660 m east of

the northwest corner of section 32, T. 18 N., R. 30 E.

RANGE IN CHARACTERISTICS:

Mean annual soil temperature--10 to 13 degrees C

Soil moisture--usually dry in all parts between depths of 20 and 60 cm

Depth to calcium carbonate (calcic horizon)--38 to 76 cm

Calcium carbonate equivalent in calcic horizon--5 to 35 percent

Depth to lime- and silica-indurated duripan in some pedons--100 to 150 cm

Ap horizon

Value--5 or 6 dry, 3 or 4 moist

Chroma--2 or 3 dry or moist

Texture--very fine sandy loam, fine sandy loam

Reaction--6.6 to 8.4

Thickness--10 to 25 cm

Bw horizon

Value--5 or 6 dry, 3 or 4 moist

Chroma--2 or 3 dry or moist

Texture--very fine sandy loam, silt loam, loamy very fine sand, fine sandy loam

Reaction--6.6 to 8.4

Thickness--23 to 50 cm

2Bk horizon

Hue--2.5Y, 10YR

Value--4 or 5 moist, 6 or 7 dry

Chroma--2 or 3 dry or moist

Texture--stratified silt loam, very fine sandy loam, or fine sandy loam; gravelly coarse sand or very gravelly coarse sand at a depth of 100 to 150 cm in some pedons

Reaction--7.4 to 9.0

Combined thickness--greater than 75 cm

COMPETING SERIES:

[Adkins](#)--no calcium secondary calcium carbonate within a depth of 61 cm

[Atlanta](#)--A horizon that has 15 to 25 percent calcium carbonate equivalent

[Bertelson](#)--no cambic horizon

[Briabbit](#)--50 to 100 cm (moderately deep) to a paralithic contact (tuff)

[Crestline](#)--15 to 35 percent gravel in particle-size control section

[Declo](#)--8 to 18 percent clay in particle-size control section; 8 to 46 cm deep to calcic horizon; laminated sediment below a depth of 64 to 100 cm

[Eoyote](#)--8 to 12 percent clay in particle-size control section; 20 to 30 cm deep to calcic horizon

[Escalante](#)--8 to 18 percent clay and 0 to 35 percent gravel in particle-size control section; 15 to 40 percent calcium carbonate equivalent in calcic horizon

[Kecko](#)--10 to 18 percent clay in particle-size control section; 50 to 100 cm deep to calcic horizon

[Somsen](#)--50 to 100 cm (moderately deep) to a lithic contact (basalt); 8 to 18 percent clay and 15 to 35 percent rock fragments in particle-size control section; 18 to 41 cm deep to calcic horizon

[Strevell](#)--10 to 15 percent clay and 5 to 30 percent rock fragments in particle-size control section; 25 to 50 cm deep to calcic horizon

GEOGRAPHIC SETTING:

Elevation--90 to 400 m in Washington, ranges to 790 m in MLRA 11 in Oregon

Climate--arid; warm, dry summers; cool, moist winters

Mean annual precipitation--150 to 250 mm

Mean January air temperature--about -3 degrees C

Mean July air temperature--about 22 degrees C
Mean annual air temperature--about 10 to 12 degrees C
Frost-free season--135 to 200 days

GEOGRAPHICALLY ASSOCIATED SOILS:

[Hezel](#)--on terraces; coarse texture in upper part of particle-size control section
[Kennewick](#)--on terraces; no cambic horizon; calcareous throughout
[Nyssa](#)--on terraces; silt loam in particle-size control section; duripan
[Quincy](#)--on dunes; sandy
[Owyhee](#)--coarse-silty, laminated, slowly permeable, calcareous sediment at a depth of 50 to 89 cm
[Royal](#)--no calcic horizon
[Sagemoor](#), [Warden](#)--on terraces; coarse-silty
[Shano](#)--on hills; coarse-silty
[Scooteney](#)--averages 20 to 35 percent gravel in particle-size control section

DRAINAGE AND SATURATED HYDRAULIC CONDUCTIVITY:

Drainage class--well drained
Saturated hydraulic conductivity (Ksat)--moderately high

USE AND VEGETATION:

Use--nonirrigated wheat and rye production, livestock grazing, irrigated crop production
Native vegetation--bluebunch wheatgrass, Sandberg bluegrass, Thurber needlegrass, needle and thread, Wyoming big sagebrush

DISTRIBUTION AND EXTENT: South-central Washington and eastern Oregon; MLRAs 7 and 11; moderate extent

SOIL SURVEY REGIONAL OFFICE (SSRO) RESPONSIBLE: Portland, Oregon

SERIES ESTABLISHED: Malheur County, Oregon; 1975

REMARKS:

Diagnostic horizons and other features recognized in this pedon
*Ochric epipedon
*Cambic horizon--zone from 20 to 48 cm
*Calcic horizon--zone from 48 to 150 cm
*Particle-size control section--zone from 25 to 100 cm

National Cooperative Soil Survey
U.S.A.

LOCATION TAUNTON

WA+ID OR UT

Established Series
Rev. JJR/KWH/TLA
09/2019

TAUNTON SERIES

Landscape--plateaus
Landform--structural benches, fan terraces, mesas
Slope--0 to 45 percent
Parent material--alluvium
Mean annual precipitation--about 200 mm
Mean annual air temperature--about 10 degrees C
Depth class--moderately deep to a duripan
Drainage class--well drained
Soil moisture regime--aridic
Soil temperature regime--mesic
Soil moisture subclass--xeric

TAXONOMIC CLASS: Coarse-loamy, mixed, superactive, mesic Xeric Haplodurids

TYPICAL PEDON: Taunton fine sandy loam, cultivated

Ap--0 to 13 cm; fine sandy loam, light brownish gray (10YR 6/2) dry, dark grayish brown (10YR 4/2) moist; weak fine granular structure; soft, very friable, nonsticky and nonplastic; common roots; moderately alkaline (pH 8.0); abrupt smooth boundary

Bw--13 to 46 cm; fine sandy loam, pale brown (10YR 6/3) dry, brown (10YR 4/3) moist; weak medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; common roots; few very fine tubular pores; moderately alkaline (pH 8.0); clear wavy boundary

Bkq--46 to 61 cm; gravelly fine sandy loam, pale brown (10YR 6/3) dry, brown (10YR 4/3) moist; massive; soft, very friable, nonsticky and nonplastic; common roots; few very fine tubular pores; 20 percent lime- and silica-cemented gravel-sized fragments; strongly effervescent; strongly alkaline (pH 8.6); abrupt smooth boundary

2Bkqm--61 cm; very pale brown (10YR 8/2) indurated duripan; thin smooth laminar cap on surface; violently effervescent in laminar cap and matrix

TYPE LOCATION: Adams County, Washington, about 75 m south and 15 m east of the center of the NW1/4 of section 16, T. 15 N., R. 28 E.; Willamette Meridian

RANGE IN CHARACTERISTICS:

Mean annual soil temperature--11 to 13 degrees C
Soil moisture--dry in all parts between depths of 20 and 60 cm, or to the duripan, more than one-half the time when the soil temperature is higher than 5 degrees C (about 105 to 135 days)
Depth to secondary carbonates (calcic horizon)--25 to 64 cm
Depth to indurated duripan--50 to 100 cm

Ap horizon

Value--5 or 6 dry, 3 or 4 moist

Chroma--2 to 4 dry or moist

Structure--granular, subangular blocky

Thickness--8 to 23 cm

Bw horizon

Value--5 to 8 dry, 3 to 6 moist

Chroma--2 to 4 dry or moist

Texture--silt loam, loam, very fine sandy loam, sandy loam, fine sandy loam

Reaction--7.4 to 8.4

Thickness--15 to 48 cm

Bkq horizon

Hue--2.5Y, 10YR

Value--5 to 8 dry, 3 to 6 moist

Chroma--1 to 4

Texture--silt loam, loam, sandy loam, fine sandy loam, very fine sandy loam

Content of gravel-sized, lime- and silica-cemented fragments--0 to 35 percent

Reaction--7.4 to more than 9.0

Calcium carbonate content--15 to 25 percent

Thickness--15 to 51 cm

COMPETING SERIES:

[Doel](#)--no carbonates above a duripan; sand below duripan

[Jestrick](#)--65 to 100 cm (moderately deep) to a lithic contact (basalt)

[Ticeska](#)--58 to 100 cm (moderately deep) to a lithic contact (basalt)

[Oupico](#)--calcareous throughout cambic horizon

[Shalake](#)--average of 15 to 35 percent rock fragments in particle-size control section

[Tauncal](#)--calcareous to the surface in areas mixed to a depth of 20 cm

GEOGRAPHIC SETTING:

Elevation--60 to 670 m in Washington and Oregon; dominantly 910 to 1525 m in Idaho, but ranges to 1675 m on south- and west-facing slopes

Climate--arid; hot, dry summers; cool, moist winters

Mean annual precipitation--150 to 310 mm

Mean January air temperature--about -2 degrees C

Mean July air temperature--about 22 degrees C

Mean annual air temperature--about 9 to 12 degrees C

Frost-free season--135 to 210 days in Washington and Oregon, 100 to 140 days in Idaho

GEOGRAPHICALLY ASSOCIATED SOILS:

[Paulville](#), [Royal](#)--no duripan

[Scoon](#)--25 to 50 cm (shallow) to a duripan

[Wiehl](#)--no duripan; 50 to 100 cm (moderately deep) to a paralithic contact (sandstone)

DRAINAGE AND SATURATED HYDRAULIC CONDUCTIVITY:

Drainage class--well drained

Saturated hydraulic conductivity (Ksat)--moderately high above the duripan

USE AND VEGETATION:

Use--livestock grazing, irrigated crop production

Native vegetation--Wyoming big sagebrush, bluebunch wheatgrass, Thurber needlegrass, Sandberg bluegrass, buckwheat, gray rabbitbrush

DISTRIBUTION AND EXTENT: South-central Washington, north-central Oregon, and southern Idaho; MLRAs 7, 8, and 11; moderate extent

SOIL SURVEY REGIONAL OFFICE (SSRO) RESPONSIBLE: Portland, Oregon

SERIES ESTABLISHED: Walla Walla County, Washington; 1960

REMARKS:

Diagnostic horizons and other features recognized in this pedon

*Ochric epipedon

*Cambic horizon--zone from 13 to 46 cm

*Calcic horizon--zone from 46 to 61 cm

*Depth to duripan--61 cm

*Particle-size control section--zone from 25 to 61 cm

National Cooperative Soil Survey
U.S.A.

LOCATION WARDEN

WA+OR

Established Series

Rev. HRG/TLA/RWL

09/2019

WARDEN SERIES

Landscape--hills, plateaus, valleys

Landform--dominantly terraces and terrace escarpments, but also strath terraces, hillslopes, and dunes

Slope--0 to 65 percent

Parent material--thin mantle of loess over lacustrine or glaciolacustrine deposits

Mean annual precipitation--about 180 mm

Mean annual air temperature--about 10 degrees C

Depth class--very deep, deep

Drainage class--well drained

Soil moisture regime--aridic

Soil temperature regime--mesic

Soil moisture subclass--xeric

TAXONOMIC CLASS: Coarse-silty, mixed, superactive, mesic Xeric Haplocambids**TYPICAL PEDON:** Warden very fine sandy loam, cultivated

Ap--0 to 15 cm; very fine sandy loam, light brownish gray (10YR 6/2) dry, dark grayish brown (10YR 4/2) moist; weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots; slightly alkaline (pH 7.8); abrupt smooth boundary

Bw--15 to 48 cm; very fine sandy loam, pale brown (10YR 6/3) dry, brown (10YR 4/3) moist; weak medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; common fine roots; common very fine tubular pores; slightly alkaline (pH 7.8); abrupt smooth boundary

2Bk--48 to 102 cm; silt loam, pale brown (10YR 6/3) dry, brown (10YR 4/3) moist; massive; hard, firm, slightly sticky and slightly plastic; few thinly laminated lenses; common fine roots; many very fine tubular pores; few secondary lime aggregates; violently effervescent; moderately alkaline (pH 8.4); clear wavy boundary

2C1--102 to 137 cm; very fine sandy loam, pale brown (10YR 6/3) dry, brown (10YR 5/3) moist; massive; soft, friable, nonsticky and nonplastic; common fine roots; common very fine tubular pores; violently effervescent; strongly alkaline (pH 8.6); clear wavy boundary

2C2--137 to 150 cm; silt loam, light gray (10YR 7/2) dry, light brownish gray (10YR 6/2) moist; massive; hard, firm, slightly sticky and slightly plastic; few roots; few very fine tubular pores; violently effervescent; strongly alkaline (pH 8.6)

TYPE LOCATION: Adams County, Washington; about 30 m south and 150 m east of the northwest corner of section 19, T. 16 N., R. 30 E., Willamette Meridian

RANGE IN CHARACTERISTICS:

Mean annual soil temperature--10 to 13 degrees C

Moisture control section--continuously dry in all parts between depths of 10 and 30 cm from about May 1 to

October 1

Depth to secondary carbonates--38 to 97 cm

Depth to a duripan in some pedons--more than 100 cm

Content of gravel--as much as 15 percent

Ap horizon

Value--5 or 6 dry; 3, 4, or 5 moist

Chroma--2 or 3 moist or dry

Texture--fine sandy loam, silt loam, very fine sandy loam

Content of clay--5 to 15 percent

Content of fine gravel--0 to 2 percent

Thickness--8 to 25 cm

Bw horizon

Value--5 or 6 dry; 3, 4, or 5 moist

Chroma--2 to 4 moist or dry

Texture--very fine sandy loam, silt loam

Content of clay--8 to 15 percent

Content of fine gravel--0 to 2 percent

Thickness--23 to 71 cm

2Bk horizon

Hue--10YR, 2.5Y

Value--6 or 7 dry, 4 or 5 moist

Chroma--2 or 3 moist or dry

Texture--stratified silt loam and very fine sandy loam

Calcium carbonate equivalent--1 to 30 percent

Thickness--20 to 100 cm

2C horizon

Texture-- silt loam to loamy fine sand

Vertical or diagonal clastic dikes--in some pedons

COMPETING SERIES:

[Bedground](#)--100 to 150 cm (deep) to a lithic contact; no secondary carbonates above 50 cm

[Sagemoor](#)--38 to 76 cm to continuous thin laminations; 36 to 61 cm to secondary carbonates

[Shano](#)--no stratified substratum; 20 to 115 cm to secondary carbonates

GEOGRAPHIC SETTING:

Elevation--90 to 400 m

Climate--warm, dry summers; cool, moist winters

Mean annual precipitation--150 to 230 mm

Mean January air temperature--about -3 degrees C

Mean July air temperature--about 22 degrees C

Mean annual air temperature--about 9 to 12 degrees C

Frost-free season--135 to 200 days

GEOGRAPHICALLY ASSOCIATED SOILS:

[Gravden](#)--loamy-skeletal particle-size class; 25 to 50 cm (shallow) to a duripan; on terraces

[Kennewick](#)--calcareous in all parts; on terraces

[Royal](#), [Sagehill](#)--coarse-loamy particle-size class; on terraces

[Sagemoor](#)--38 to 76 cm to continuous thin laminations; 36 to 61 cm to secondary carbonates

[Shano](#)--solum more than 150 cm thick; no stratified substratum; 30 to 114 cm to secondary carbonates

[Taunton](#)--coarse-loamy particle-size class; on terraces; 50 to 100 cm (moderately deep) to a duripan

[Wahluke](#)--weakly cemented; no cambic horizon; on lakebeds and terraces

DRAINAGE AND SATURATED HYDRAULIC CONDUCTIVITY:

Drainage class--well drained

Saturated hydraulic conductivity (Ksat)--moderately high

USE AND VEGETATION:

Use--irrigated crop production, livestock grazing, some nonirrigated crop production

Nonirrigated crops--wheat and rye grown in a summer fallow system

Irrigated crops--wheat, grass-legume hay, potatoes, dry beans, dry peas, tree fruit, hops, mint, vegetables

Native vegetation--bluebunch wheatgrass, Sandberg bluegrass, needleandthread, big sagebrush

DISTRIBUTION AND EXTENT: Central Washington and north-central Oregon; MLRAs 7 and 8; moderate extent

SOIL SURVEY REGIONAL OFFICE (SSRO) RESPONSIBLE: Portland, Oregon

SERIES ESTABLISHED: Columbia Basin Area Reconnaissance, Washington; 1929

REMARKS:

Diagnostic horizons and other features in this pedon

*Ochric epipedon

*Cambic horizon--zone from 15 to 48 cm

*Carbonate accumulation--zone from 48 to 102 cm

*Calcium carbonate equivalent--assumed less than 15 percent

*Particle-size control section--zone from 25 to 100 cm

National Cooperative Soil Survey
U.S.A.

ATTACHMENT E

Farm 6 – Expansion Project
Groundwater Monitoring Well Network

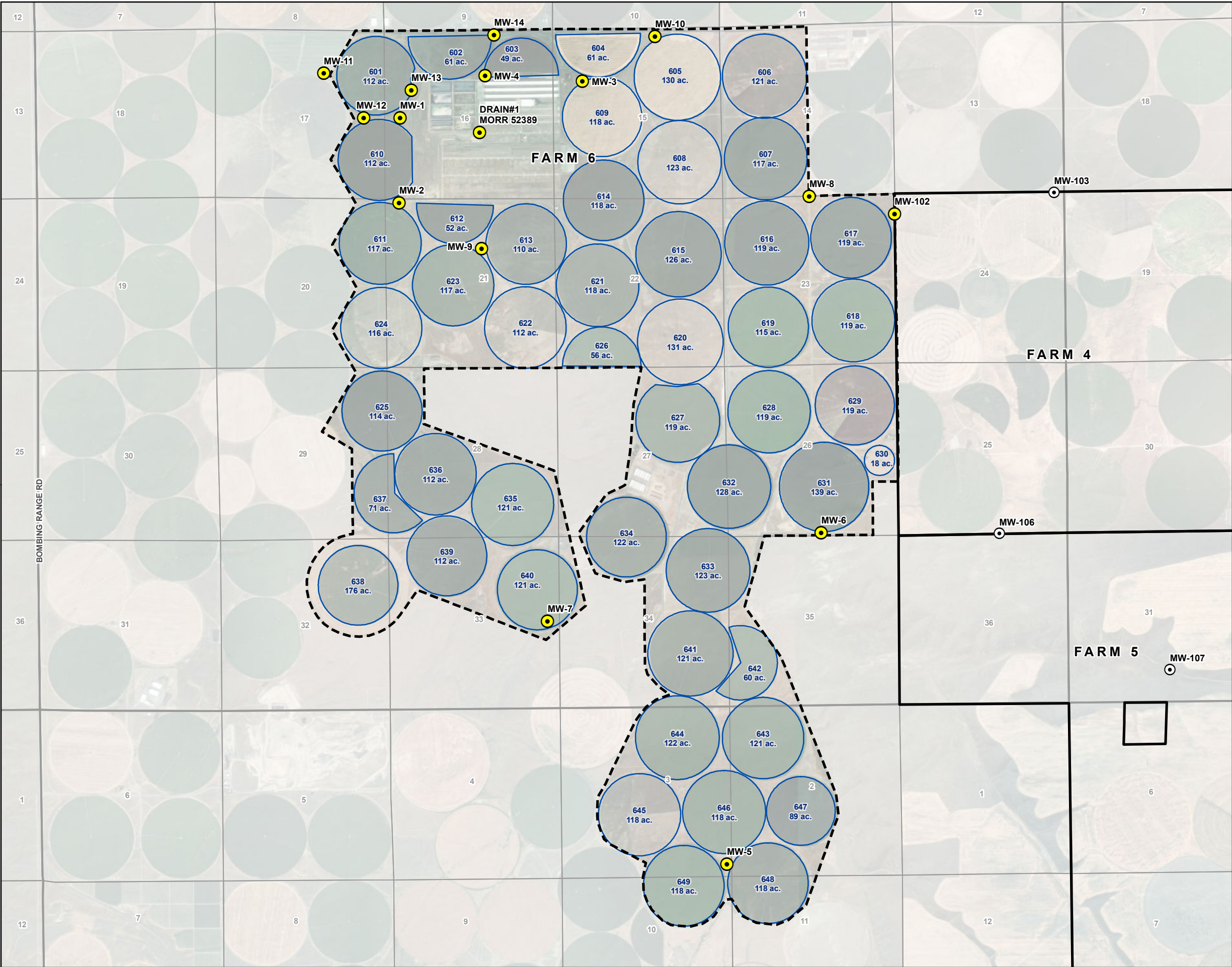
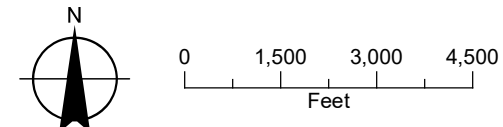


FIGURE
Proposed Expansion Project
Boundary, Irrigation Circles,
and Monitoring Wells
Farm 6 - Land Application
Program Expansion
Port of Morrow (POM)

- LEGEND**
- Farm 6 Monitoring Well
 - Monitoring Well
 - Farm 6 Proposed WPCF Boundary Expansion
 - POM Existing WPCF Permit Boundary
 - Existing Irrigation Circle



ATTACHMENT F

Farm 6 – Expansion Project
Adjacent Water Well Survey

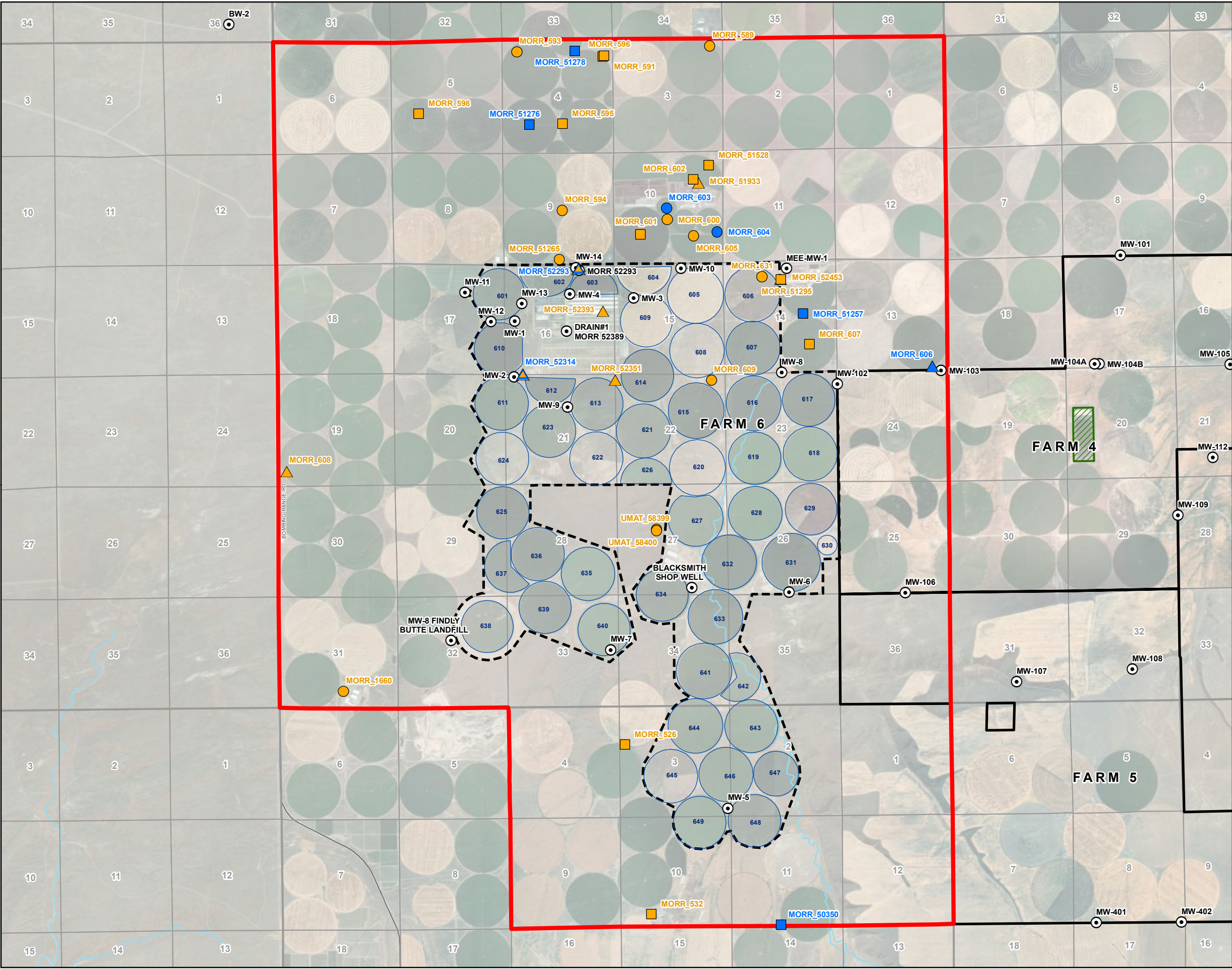
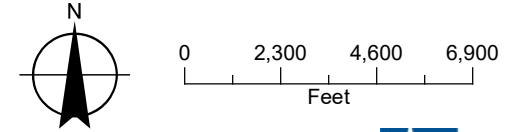


FIGURE
Water Well Survey
Farm 6 - Land Application
Program Expansion
Port of Morrow (POM)

- LEGEND**
- Monitoring Well
 - Domestic Well
 - Irrigation Well
 - Other Well
 - Basalt Water Well
 - Sediment Water Well
 - Irrigation Circle
 - Farm 6 Proposed WPCF Boundary Expansion
 - POM Existing WPCF Permit Boundary
 - Water Well Survey Area
 - Process Water Storage Pond
 - Major Road



ATTACHMENT G

Farm 6 – Expansion Project
DEQ Land Use Compatibility Approval
Morrow County

DEQ Land Use Compatibility
Statement will be submitted under
separate cover when completed
by Morrow County