Permit Changes and Response to Comments
Burr Oak Heifers, LLC
WPDES Permit No. WI-0061824-03-0

Following is a summary of significant comments and any significant changes which have been made in the terms and conditions set forth in the draft permit.

Comments Received from the Applicant, Individuals or Groups and Any Permit Changes as Applicable.

The noticed public comment period, which extended from February 5 to April 22, 2014, provided the general public and permittee an opportunity to comment on the proposed reissuance of the Burr Oak Heifers (BOH) WPDES permit. During this period, the Department received approximately 120 written comments. The primary issue noted by commenters was their opposition to the establishment of an Alternative Concentration Limit (ACL) for Nitrates (at 28 mg/l).

The Department held an informational session and public hearing on April 15, 2014, beginning at 1:00 p.m., at the Adams Community Center, 569 North Cedar Street, Adams, WI 53910. Approximately 140 residents attended the public hearing. Of the 77 hearing appearance forms submitted at the hearing, 10 individuals registered in support of the BOH permit, 49 registered in opposition and 18 did not indicate a position. Of the 21 individuals who provided oral testimony, 19 individuals spoke in opposition to BOH and 2 did not identify a position of support or opposition.

Comments received at the public hearing included concerns about groundwater, surface water, runoff pollution, reduced property values, jobs, soil conditions, concentration of CAFOs in the area, concerns about local roads and infrastructure, increased truck traffic, odor, noise levels, inadequate DNR resources to monitor and regulate, use of antibiotics, air quality, nutrient management plans, quality of life, working conditions, effect on family farms, exclusion of potential impacts to nearby creeks, use of manure as a nutrient verses man-made chemicals, potential health impacts and manure digesters.

Comments Received from EPA or Other Government Agencies and Any Permit Changes as Applicable

No comments received.

WPDES Comments-Changes Made

Comment #1: The Department received a number of comments against granting an exemption to the groundwater standard for nitrate under the BOH WPDES permit (and in opposition to the proposed ACL of 28 mg/L), stating that the site does not meet the criteria established in s. NR 140.28(4)(a). One of the primary stated objections to granting such an exemption was that it is difficult for the Department to adequately evaluate background groundwater quality at the BOH site because:

1) there is a possibility that the groundwater divide, identified by the Wisconsin Geologic and Natural History Survey on the Adams County water table elevation map as just west/northwest of the BOH site, may actually be located on the BOH site, and

2) there is a possibility, due to its location on the BOH site, that samples from monitoring well MW-2 may reflect impacts from the previous Opitz Custom Heifers (OCH) livestock operation, rather than indicating the quality of "background" groundwater flowing onto the BOH site.

Response: The Department's groundwater evaluation, using monitoring information from the current BOH groundwater monitoring system, does not appear to support these "possibilities". For the period of December 2004 through September 2013, the nitrate sampling results of groundwater monitoring well "MW-2" at BOH, averaged approximately 15 mg/L, with levels as high as 29 mg/L reported. Based on groundwater elevation measurements at the three production area monitoring wells for the same period, results indicate that local groundwater flow across the site is from northwest to southeast. The location of the groundwater divide - as mapped by the WI Geological and Natural History Survey (1981 Adams County Water Table Elevation map), depicts the divide slightly west of the BOH production area.

The Department recognizes that the location of BOH monitoring well MW-2 is not ideal for evaluating background groundwater quality flowing onto the site. The well is not located at the edge of the property, but approximately 500 feet east of the property boundary. Because there is a small area of the site located upgradient of MW-2 where past feedlot activities occurred, it is possible that monitoring well sample results might reflect some feedlot impacts. Under the proposed BOH permit, outdoor feedlot activities have been eliminated from the Western portion of the BOH production area, so future sample results from monitoring well MW-2 should reflect only background conditions of groundwater flowing onto the site at that location.

While the current groundwater monitoring system has been adequate to characterize area groundwater and associated impacts from OCH and require response actions under s. NR 140.26 for OCH/BOH, it is inadequate to definitively determine whether the above objections to granting an exemption are correct or not. For this reason, the Department will require changes to the current groundwater monitoring system, including installation of at least two additional monitoring wells and more frequent monitoring of groundwater elevations at the site. The upgraded groundwater monitoring system will provide the Department with groundwater elevation measurements and groundwater quality samples that will result in a more comprehensive data set that can then be utilized to verify the groundwater flow direction and background groundwater quality at the site. This information will also allow the Department to determine whether groundwater monitoring well MW-2 was impacted by past feedlot activities. The additional data from the updated groundwater monitoring system, including data from monitoring well MW-2, will be utilized by the Department to establish background levels and determine whether to grant an exemption and establish an ACL.

Due to the above concerns regarding background groundwater quality levels and the possibility of a groundwater flow divide being located within the BOH production area, the Department has determined that it is appropriate to defer a decision on the proposed nitrate groundwater quality standard exemption and ACL. Issuing the BOH WPDES permit, while deferring a decision on a nitrate exemption and ACL, will allow the permittee to continue to take necessary response actions under ch. NR 140, Wis. Adm. Code, to address nitrate enforcement standard exceedances caused by past OCH practices. Current response actions being implemented at BOH under s. NR

140.26(2), Table 6, Items 1 and 2, are a revision of operational procedures at the facility and a change in facility design and construction.

Issuance of the WPDES permit ensures that these response actions will be continued, including an upgrade of the facility groundwater monitoring system, collection of additional groundwater elevation measurements and groundwater quality samples for analysis. With the additional groundwater monitoring results, Department staff will be better able to evaluate and verify groundwater flow and background groundwater quality at the site, and determine whether to grant an exemption and establish an ACL at the next permit issuance.

As a result of the decision to defer a determination on a proposed nitrate groundwater quality standard exemption and ACL, the following language has been removed, changed or added within the BOH WPDES Permit:

1) Section 2, Production Area Monitoring Requirements. The following narrative was **removed**:
Alternative Concentration Limit (ACL) for Nitrate + Nitrite (as N): Based upon historic site monitoring results from monitoring well MW-2, the Department is granting an exemption of the Nitrate + Nitrite (as N) Enforcement Standard at the Burr Oak Heifers site (per s. NR 140.28, Wis. Adm. Code). An Alternative Concentration Limit (ACL) for Nitrate + Nitrite (as N) is established for this parameter at 28 mg/l. In accordance with Program Guidance, this ACL was calculated as the background mean concentration from well MW-2 plus 2 standard deviations.

2) Section 2, Production Area Monitoring Requirements. Under the Enforcement Standard (ES) heading for the Nitrogen, Nitrate + Nitrite within the required monitoring table, the ACL of 28.0 mg/l was **removed** and the number in the table was **changed** to 10.0 mg/l. The Permittee shall continue to take necessary response actions under s. NR 140.26, Wis. Adm. Code, due to exceedances of the Nitrogen, Nitrate + Nitrite Enforcement Standard.

3) Section 2, Production Area Monitoring Requirements. Under the Preventive Action Limits (PAL) heading for the Nitrogen, Nitrate + Nitrite Parameter within the required monitoring table, the PAL was **changed** to 2.0 mg/l and the ACL foot note reference was **removed**.

4) Section 2, Production Area Monitoring Requirements. The following footnote narrative reference associated with the required monitoring table for the parameter Nitrogen, Nitrate + Nitrite was **removed**:

- ***Department granted exemption per s. 140.28, Wis. Adm. Code to establish an Alternative Concentration Limit (ACL), calculated as the background mean concentration from well MW-2 plus 2 standard deviations.*

5) Section 2, Production Area Monitoring Requirements. The following footnote narrative reference associated with the required monitoring table for the parameter Nitrogen, Nitrate + Nitrite** has been **changed** to read as follows:
**After monthly monitoring requirements identified under the "Frequency" column heading in the table above are met, the Department will re-evaluate all data collected. The data will be utilized to establish background levels and determine whether to grant an exemption and establish an ACL in accordance with procedures identified within Chapter NR 140, Wis. Adm. Code, and these values will be placed in the table above, at the next permit issuance.

6) Section 3, Schedules, Production Area Monitoring – Groundwater Monitoring Well Installation. The permittee submitted required plans and specifications for the groundwater monitoring system upgrade; Department approval is documented within a plan approval letter dated August 14, 2014. Since the permittee has met this compliance requirement, it was **removed** from the schedules section of the permit.

Comment #2: A comment was received expressing concerns that BOH is too large and that the DNR should limit the number of animals at the site to 500 head. This would allow farms to continue to operate while reducing water and waste issues.

Response: BOH – the successor to OCH - is an existing WPDES permitted CAFO facility. All livestock from the four facilities permitted under OCH have been consolidated under roof, on liquid tight concrete floors at BOH. It is not within the Department's authority to determine where a given CAFO should be sited. Rather than rely on an arbitrary limitation on the number of animal units or head at an operation as a means to protect water quality, the Department instead requires permittee's to have adequate land base to land apply the generated manure / wastewater and to maintain a minimum of 180-days of manure/wastewater storage capacity to meet WPDES permit requirements. The 2,982 acres of cropland identified within the BOH NMP provides adequate land base to land apply the manure and wastewater to meet WPDES permit requirements. Actions taken by the facility to abandon all outdoor livestock lots has eliminated a significant nitrate loading source. The housing facilities at the BOH site will accommodate 2,675 animal units (3,100 heifers). Based upon the 2,675 AUs, BOH has 192 days of available manure storage capacity. To clearly ensure that the permittee properly demonstrates that it is maintaining 180-days of storage capacity for liquid manure, the Department has modified Section 1.3.3 of the permit (see below), to include a baseline animal unit number from which to identify percentage increases for potential future expansions.

1.3.3 Liquid Manure – 180-day storage
The permittee shall demonstrate, to the Department, in writing, compliance with the 180-day design storage capacity requirement at all the following times:

- As part of an application for permit reissuance.
- At the time of submittal of plans and specifications for proposed reviewable facilities or systems.
- In annual reports to the department.
- When an operation is proposing, at any time, a 20% expansion in animal units above the baseline or an increase by an amount of 1,000 animal units or more unless the Department has approved reductions in design storage in accordance with s. NR 243.17(4). The baseline for calculating a 20% expansion is 2,675 animal units or the number of animal units present at the operation based on the operation's most recent annual report required under s. NR 243.19(3)(c), whichever is greater.

WPDES Comments - No Changes Made

Comment #3: A comment expressed concerns about the hearing being held when most residents are working and unable to attend.

Response: With regard to the time of day in which hearings are held, the Department frequently hears concerns about both day and night hearings. Our experience is that the day hearings are very well attended. If an individual is not able to attend, comments can be submitted to the Department during the public notice period, including an additional seven days after the date of the hearing. Written comments are given the same consideration and weight as oral statements that are provided during the public hearing.

Comment #4: A number of comments received expressed concerns about reissuing the WPDES permit for BOH, particularly in light of existing water quantity and quality issues in the area (high nitrate levels in area groundwater). One commenter referenced the Central Wisconsin Groundwater Center study which concluded that private wells located in the Little Roche-A-Cri Creek watershed had the second highest percentage of nitrate concentrations (greater than 20 ppm) within the entire Central Wisconsin Basin. Commenters expressed concerns about the potential additional nitrogen loadings to groundwater from BOH given the porous soils in the area. One commenter stated they were alarmed that the State of Wisconsin and its DNR use the excuse that they have no legislation or authority to prevent further environmental damage and that they would choose to permit one more CAFO.

Response: Existing water quality and quantity issues in the area are not a legal basis for denial of the WPDES permit. The Department exercised its permit authority by returning OCH and its successor, BOH, to compliance with WPDES permit requirements. In addition to a court settlement obtained by the Wisconsin Department of Justice which resulted in penalties, costs and assessments of $65,000, OCH also agreed to take the necessary actions to return the four facilities covered under the existing permit to compliance with WPDES permit requirements in accordance with DNR recommendations.

BOH has been redeveloped to meet WPDES permit requirements. As a result of the court settlement, non-vegetated feedlots at the four farms previously permitted under OCH have been abandoned (Briese, Roberts, Machan & Burr Oak). All remaining livestock have been relocated to housing facilities at BOH. Containment, collection and storage structures have been constructed at BOH to meet or exceed required technical standards and the Department is requiring the operation to construct a minimum of two additional groundwater monitoring wells (three wells currently exist) within the production area, in part due to recognition of potential impacts due to the porous nature of area soils. The Department believes that additional monitoring requirements (groundwater monitoring wells) are warranted to determine if manure and process wastewater structures/systems are constructed and operated properly. Manure and process wastewater is land applied in accordance with the facility's nutrient management plan (NMP) which was reviewed and approved by the Department.

The proposed and finalized WPDES permit contains conditions that protect groundwater and surface water quality and are consistent with ch. NR 243, Wis. Adm. Code, which establishes permit requirements for CAFOs throughout the state. To address the unique site conditions for this operation, the Department also added the following site specific permit conditions within the permit pursuant to authority under s. NR 243.14(10), Wis. Adm. Code.

For the production area:

- "Production Area Monitoring Requirements" section was added to the permit in Section 2, to identify groundwater monitoring system parameters within the production area.
- A construction schedule (section 3.3 "Production Area Monitoring-Groundwater

Monitoring Well Installation) was added to the "Schedules" section of the permit outlining the timing of the required installation of additional groundwater monitoring wells within the Burr Oak Heifer facilities production area.

- Section 4.2. "Groundwater Standard Requirements" was added to the Standard Requirements section pertaining to groundwater monitoring that is to be conducted by the permittee.
- Due to consideration of the more permeable sands, structures at BOH were built utilizing more stringent construction standards, which includes a layer of compacted clay under-laying liquid tight concrete.

The BOH NMP, which is a required component of the WPDES permit, was specifically developed to meet the requirements listed within the permit and NR 243, Wis. Adm. Code. Additional information regarding the BOH NMP is discussed in comment response #29.

As a result of these actions, it is the Department's belief that groundwater nitrate levels will decrease within the immediate vicinity of the four sites previously permitted under OCH.

The elevated background nitrate levels of groundwater flowing into the BOH production area are elevated due to activities not associated with the BOH operation. The DNR's WPDES CAFO permit authority extends to the permitted facility's production area and any cropland identified within the regulated facility's NMP, where the permittee intends to land apply manure and/or process wastewater. The DNR does not have statutory authority to regulate commercial fertilizer applications applied to crop fields not utilized by the permittee for manure applications, nor does the department have the authority to regulate commercial fertilizer applications made to cropland by non-permitted entities on cropland not associated with BOH via the WPDES permit.

There are programs in place in Wisconsin, both regulatory and voluntary, that are designed to address groundwater impacts associated with agriculture that are not covered by the WPDES permit program. These programs are part of an effort of local (county, town), state (DNR, DATCP) and federal (EPA, NRCS) agencies to promote implementation of agricultural best management practices to improve water quality. Information on these programs can be found on the Department's website at: http://dnr.wi.gov/topic/nonpoint/.

Comment #5: Numerous comments stated opposition to establishing an ACL (of 28 mg/l), in part based on s. NR 140.28(4)(a), which states, " . . . and the existing or anticipated increase in the concentration of the substance does not present a threat to the public health or welfare." The average background concentration of nitrates in the upgradient groundwater is 14 mg/l with a high of 29 mg/l recorded. This level is clearly a public health risk and any increase in the groundwater nitrate concentration clearly increases this health risk. Since the BOH facility is designed to eliminate and prevent groundwater pollution with nitrates, any increase in nitrates as a result of the facility operation is a violation of the permit, and indicates that the facility is not being properly operated and maintained. If BOH causes an increase in groundwater nitrate as a result of poor facility management, they clearly are causing an increased risk to public health.

Some commenters recommended that the permit state that the nitrate level in the monitoring wells downgradient of the facility be required to not exceed the average nitrate level of the upgradient monitoring wells, with a variance in the range of concentrations the same as, or no greater than that found in the upgradient monitoring wells. One commenter recommended that based on the ten-year mean average of nitrate + nitrite (as N) at background monitoring well

MW-2, that the ACL be set at 15 mg/l N to start, and suggested that the Department require a reduction in the level, to meet state standards of 10 mg/l N by the end of the permit period. These requirements would show (and require) that the facility is not causing pollution of the groundwater to be greater than the background concentration for which they are not responsible.

Response: As noted in responses throughout this document, the Department's enforcement action and subsequent referral to the State Department of Justice resulted in a court settlement which required operational changes to occur at the BOH site as well as three other sites (e.g., elimination of outdoor feedlots) operated under the OCH WPDES permit.

The BOH facility has been designed and constructed with a Department approved liquid tight manure storage lagoon, a feed storage leachate collection system and impervious floored livestock barns. The proposed operation of the BOH facility includes the containment, collection and long-term storage of all manure and process wastewater generated at the facility. Manure and process wastewater will be land applied as specified within the facility's NMP that was approved by the Department.

As a result of the facility renovations, groundwater nitrate contaminant loading sources have been **minimized** and the Department anticipates groundwater nitrate levels in the area to decrease. However, the Department agrees that if BOH, in spite of these additional protections, causes an increase in groundwater nitrate above background levels as a result of poor facility management, they should be held accountable for such an increase. The purpose of an ACL is to use a scientifically justifiable means to determine if increases in groundwater nitrate are due to actual impacts or are the result of data variability. Use of data averaging is not appropriate in accounting for data variability; thus, the Department relies on the use of calculating a standard deviation of a dataset (in this case, groundwater monitoring results) to set an ACL. Therefore, the Department believes that the renovated BOH facility no longer represents a threat to public health or welfare and expects water quality to improve over time, the requirements for continued groundwater monitoring, and potential future development of an ACL, will help determine whether this actually occurs.

Establishing an ACL at the average concentration of background nitrate would mean that nitrate levels on site - due to background contamination - would likely exceed the site ACL about fifty-percent of the time.

The intent of a site specific ACL is that it be based on consideration of background contamination levels from offsite sources and set utilizing a regulatory limit such that an exceedance of that limit would likely indicate that the regulated facility is contributing contamination to groundwater. In order to accomplish this, the Department has developed guidance which recommends establishing a site ACL at the background mean concentration plus 2 standard deviations. Using this method sets a site ACL at a 95% confidence level. This means that there would likely be a 95% chance that any exceedance of the established site ACL would be due to contamination originating from the regulated facility and not the result of background contamination flowing onto the site.

This approach would limit the BOH operation to essentially causing no future groundwater impacts, but does not penalize the entity for background site contamination caused by offsite agricultural activities (over which BOH has no control). This approach has been used when warranted by Department groundwater regulatory programs for a number of years and is

considered to be a reasonable regulatory mechanism to deal with background site contamination not caused by the facility, practice or activity being regulated.

Department groundwater regulatory programs grant exemptions to groundwater quality standards and establish site specific ACLs to adequately address background site contamination not caused by the facility, practice or activity being regulated. Based on an evaluation of available groundwater monitoring results, the Department concluded that the elevated nitrate nitrogen levels in groundwater at the BOH site originated from two sources, (1) past livestock feedlot practices, and (2) surrounding crop fields. The Department has limited authority to address the application of commercial nitrogen fertilizer on surrounding cropland that is not owned or operated by permittee. To address the contamination originating from past livestock feedlot practices (OCH), BOH has renovated /upgraded the facility to meet or exceed required technical standards.

As stated within comment response #1, due to concerns regarding background groundwater quality levels and the possibility of a groundwater flow divide being located within the BOH production area, the Department has determined that it is appropriate to defer a decision on the proposed nitrate groundwater quality standard exemption and ACL.

Comment 6: Comments were received stating that "DNR has not shown that the existing or anticipated increase in nitrates does not present a threat to public health or welfare" (in order to allow for granting an exemption under s. NR 140.28), and that the proposed site nitrate groundwater exemption sets a "dangerous public health precedent". The comments received suggest that existing site nitrate contamination, caused by past OCH livestock feedlot activities, represents a threat to public health and that, for this reason, the BOH operation should be considered to be a threat to public health.

In addition, comments suggest the BOH facility/activity and associated production area renovation is not designed to achieve the lowest possible concentration for nitrate, which is technically and economically feasible as required by s. NR 140.28, and will not prevent additional groundwater pollution. Commenters state that past practices at this facility and the fact that it is not currently operating within the restrictions placed on it by the circuit court (cattle are still roaming feedlots, barns and holding ponds are not yet completed), means there is no data to support that the lowest possible concentration of nitrates/nitrites leaving the facility has been achieved. Evaluation of the BOH facility, its practices and activities have not been completed as it is not operating. Therefore, no ACL should be allowed as there is no data to determine if the criteria for an exemption has been met. With regard to land spreading activities, the operation's NMP is a "put" and "take" operation. Fertilizer in the form of either manure or inorganic chemical is placed on fields to provide for the nutrient requirements (nitrogen, phosphate, etc.) of the crop planted in the field. The crop withdraws nutrients during the growing season, different crops using different amounts at different times. What is left over goes to the groundwater.

The NMP for Burr Oaks Heifers spreads manure from the facility production site over a large area of Waushara and Adams counties. There is no requirement in the NMP that this manure be evaluated for nitrates or phosphates. There is also no restriction on the recipient of the manure adding additional inorganic chemical fertilizer to the same fields where manure has been spread. Responsibility for the accounting of the "put" and "take" of the nitrates/nitrites – BOH or the farmer – is unstated.

Response: The Department recognizes the groundwater nitrate impacts caused by past OCH livestock feedlot activities, and that these impacts represented a threat to public health. As a result of past permit violations that caused these impacts, OCH was fined, and a Stipulation and Order of Judgment was issued. The Order required that the livestock feedlot portions of the BOH site be abandoned and that, if a heifer rearing operation was to continue at the BOH site, DNR approved housing, manure storage and runoff collection practices would be required. The last of the active OCH livestock feedlots was abandoned in July 2014, as all remaining livestock were moved into newly constructed housing facilities at the BOH facility.

As noted above, in order to address nitrate enforcement standard exceedances caused by past OCH activities, response actions under ch. NR 140, Wis. Adm. Code, are being implemented at the BOH site. The Department has concluded that the BOH facility has been designed and constructed to achieve the lowest possible concentration for nitrate nitrogen which is technically and economically feasible. The Department approved design plans include a liquid tight manure storage lagoon, liquid tight feed storage (with leachate and "first flush" stormwater collection capabilities) and livestock barns with impervious flooring (under all portions accessible by animals). The BOH facility includes the collection of all generated livestock manure, wastewater and its application on approved land spreading sites, under a Department approved NMP. Based on the facility design, construction and operation, nitrate impacts to groundwater caused by past livestock feedlot activities are anticipated to decrease. Therefore, the BOH operation does not represent a threat to public health or welfare.

Allowing an exemption, and establishing a groundwater ACL at this regulated site does not set a precedent. Background groundwater quality at regulated sites with groundwater monitoring wells installed is evaluated and, if appropriate criteria are met, exemptions to groundwater quality are allowed, and site groundwater quality ACLs established. This regulatory approach is taken so that permitted facilities and activities are not required to take ch. NR 140 regulatory response actions due to exceedance of groundwater standards caused by offsite activities. This approach has been implemented by the Department in many cases and it essentially limits the regulated activity from causing any groundwater impacts that would result in an increase above background levels.

As explained within response to comment #1, the Department has made the decision to defer a determination on granting an exemption and the establishment of an ACL.

Comment #7: Granting an ACL for BOH will result in other CAFOs requesting an ACL as soon as they are found to have exceeded the 10 mg/l.

Response: This comment suggests that granting an exemption and establishing an ACL for a groundwater quality standard is a precedent-setting action. Exemptions (and ACLs) to groundwater quality standards are considered by the Department on a case-by-case basis in administering groundwater standards for various types of regulated activities when groundwater monitoring results and site specific groundwater evaluation indicates that there are elevated "background" levels of a substance that has not likely been caused by a permittee, practice or the activity being regulated. These exemptions are only granted when site specific monitoring information indicates that they are warranted and they are not granted just because a regulated operation requests an ACL.

Comment #8: Before getting the higher nitrate pollution level (ACL), the DNR should require BOH to address the existing ground water contamination by requiring BOH to take acreage and plan pine forest buffers to absorb contamination.

Response: The groundwater nitrate loading source was eliminated when all livestock were removed from the outdoor feedlots and relocated to housing facilities at BOH. All pre-existing livestock lots have been planted to a field crop to uptake available nutrients and these fields are included within the facility's NMP. Plans and Specifications for the housing facilities, manure storage and feed pad storage were reviewed and approved by the Department and were constructed to meet or exceed required technical standards.

The Department believes that the permit as issued complies with Ch. NR 243 and provides an adequate level of water quality protection. Refer to comment response #29 for additional information on nutrient management plan requirements.

Comment #9: Several commenters stated concerns about how background water quality data was being used in the calculation of an ACL. Some comments stated that the BOH production area was likely the source of high background levels of N, in part due to the proximity of a groundwater divide near the BOH production area. Other comments suggested that according to the 1986 DNR "Determinations of Exemptions and Alternative Concentration Limits" (Guidance Document), groundwater standard exemptions and site specific ACLs would only be allowed in cases where background groundwater contamination was due to natural, non-anthropogenic causes.

Response: The DNR's determination of groundwater flow across the Burr Oak Farm site is based on groundwater elevations measured in the three existing site water table observation monitoring wells. Reported groundwater elevations from these three wells indicate a northwest to southeast groundwater flow direction across the site. A groundwater divide has been mapped by the WI Geologic & Natural History Survey, on the Adams Co. water table elevation map, as existing just to the west/northwest of the Burr Oak Farm site. Because they are generally based on water level measurements taken from private water supply wells constructed during different years, and with screened intervals generally well below the water table, county water table elevation maps are not considered to be especially accurate with respect to local groundwater flow direction at a specific site.

As documented within the "WPDES Comments – Changes Made" section of this document, the Department expects that the assumptions related to the actual location of the groundwater divide are correct - though it is not possible to verify this point by utilizing data provided under the current groundwater monitoring system at the BOH site. With due consideration of the unique site characteristics and the uncertainties they pose, the Department made the decision to defer the proposed nitrate groundwater quality standard exemption and ACL from the BOH WPDES permit.

Regarding the issue of background levels of pollutants, groundwater data from the site and the area indicates high nitrate concentration in area groundwater, not related to OCH/BOH. Site monitoring well MW-2 is located in the southwest section of the BOH production area and approximately 600' east of the western production area boundary. The location of MW-2 relative to the mapped divide includes a small portion of the production area and an area of cultivated crop fields to the west (upgradient of MW-2). Sampling results from an irrigation well

located at 278 Czech Ct. and located within the area with cultivated fields, has shown groundwater nitrate levels ranging from 19 to 41 mg/L. Based on current indications of local groundwater flow and with consideration of supporting evidence of elevated nitrate levels in groundwater upgradient of the BOH site, it seems reasonable to conclude that "background" groundwater, "natural" ambient groundwater (not affected by BOH site activities), likely contains nitrate above the ch. NR 140 enforcement standard of 10 mg/L.

Department groundwater regulatory programs grant exemptions to groundwater quality standards, and establish site specific ACLs (such as the nitrate ACL initially proposed for BOH), to adequately address background site contamination that is not caused by the facility, practice or activity being regulated. Background water quality is defined in ch. NR 140, Wis. Adm. Code, as "groundwater quality at or near a facility, practice or activity which has not been affected by that facility, practice or activity". Background groundwater at a regulated site is considered to be the natural, ambient groundwater quality, not impacted by the regulated entity. Background groundwater quality at a regulated site includes groundwater impacted by both "natural" mineral and soil weathering processes, and "natural" ambient groundwater impacted by offsite anthropogenic activities not related to the regulated facility, practice or activity.

Based on an evaluation of available groundwater monitoring results, the Department concluded that the elevated nitrate nitrogen levels in groundwater at the BOH site originated from two sources, (1) past livestock feedlot practices and (2) surrounding crop fields. The livestock lots have been eliminated, as have the groundwater impacts associated with that practice. Additional monitoring wells will be installed to confirm background nitrate levels. The operations NMP is not a new addition; as the majority of the crop land acreage included within the BOH NMP was also included within the OCH NMP (initially permitted in 2002). Much of the cropland acreage surrounding the BOH site is not owned or operated by BOH. The Department's WPDES CAFO permit authority extends to the permitted facility's production area and any cropland identified within the regulated facility's NMP, where the permittee intends to land apply manure and/or process wastewater. The Department does not have statutory authority to regulate commercial fertilizer applications that are applied to crop fields not utilized by the permittee for manure applications, nor does the department have the authority to regulate commercial fertilizer applications made to cropland by non-permitted entities on cropland not associated with a WPDES permittee.

Comment 10: How is an ACL calculated and what is its purpose? Why would an ACL be needed if the potential sources of contaminants from OCH/BOH have been addressed as stated by the Department?

Response: The intent of a site specific ACL is that it be based with consideration of background contamination levels from offsite sources and set utilizing a regulatory limit such that an exceedance of that limit would likely indicate that the regulated facility is contributing contamination to groundwater. In order to accomplish this, the Department has developed guidance which recommends establishing a site ACL at the background mean concentration plus 2 standard deviations. Using this method sets a site ACL at a 95% confidence level. This means that there would likely be a 95% chance that any exceedance of the established site ACL would be due to contamination originating from the regulated facility and not the result of background contamination flowing onto the site. This approach has been used when warranted by Department groundwater regulatory programs for a number of years and is considered to be a

reasonable regulatory mechanism to deal with background site contamination not caused by the facility, practice or activity being regulated.

This approach limits the BOH operation to essentially causing no future groundwater impacts, but does not penalize the permittee for background site contamination caused by offsite agricultural activities (over which BOH has no control). Improvements at the OCH/BOH production areas are intended to address potential contributions to area groundwater and the BOH NMP is intended to address potential impacts from land spreading activities.

While Department actions have addressed impacts associated with the OCH/BOH operations, there are still other potential sources of contamination (e.g., other agricultural activities in the area) that could contribute to elevated levels of nitrate in the area. For example, while it is true that off-site manure applications by BOH will be made to fields under an NMP, the majority of cropland located northwest of BOH is not owned or rented by the permittee.

As explained within response to comment #1, the Department has made the decision to defer a determination on granting an exemption and the establishment of an ACL.

Comment #11: Who within the DNR determines what is safe for our citizens? I can't imagine a responsible drinking water specialist being comfortable with what your group has proposed.

Response: DNR decisions are based on statutory authority granted to the Department by the state legislature. Guidance for the establishment of an ACL is under the authority of s. NR 140.28, Wis. Adm. Code. NR 140 establishes groundwater quality standards.

Watershed Management and Drinking and Groundwater Program staff have worked cooperatively throughout the OCH Department of Justice referral case and in the drafting of the BOH WPDES permit. The Department is tasked with the responsibility of ensuring that WPDES permittees meet all required technical standards before a permit is issued; BOH has met or exceeded these requirements. Refer to comment response #1 for more information regarding the Department's decision to defer a determination regarding the ACL in the BOH WPDES permit.

Comment #12: I understand that the discharging pollutants would enter the Little Roche-A-Cri Creek, which I believe is considered an exceptional resource. This official label should carry specific protections by law.

Response: The BOH production area - including a portion of the facility's cropland, is located within the Little Roche-A-Cri Watershed. Certain stream sections of the Little Roche-A-Cri Creek, which is located in closest proximity to the facility, are listed as a Class II Trout Stream, with a 4.5 mile segment of the stream designated as an Exceptional Resource Water. The Central Wisconsin River Basin Plan notes that the towns of Colburn, Richfield and Lincoln rank as priority areas for erosion control and show the greatest need for conservation practices. The Basin Plan also states that wind erosion, in conjunction with ditching and center pivot irrigation lead to nutrient and pesticide loading to local surface waters in the watershed.

The WPDES permit is a water quality based permit. The proposed and finalized permit contains permit conditions that protect groundwater and surface water and provides an adequate level of water quality protection. Information on permit conditions that protect water quality can be

found throughout this document. These permit conditions may actually reduce nutrient loading to groundwater and surface waters in the area.

Comment #13: Comments indicated that the DNR should deny reissuance of the BOH WPDES permit based on the Public Trust Doctrine.

Response: The department has no legal basis to deny issuance of a WPDES permit to a CAFO that has submitted a complete permit application if the Department determines the proposed operation will meet applicable statutes and regulations. The department has determined that BOH has submitted a complete permit application, which includes a department reviewed and approved NMP that is consistent with ch. NR 243, Wis. Adm. Code. The WPDES permit is the primary regulatory tool the department uses to protect waters of the state from pollutants associated with a CAFO's manure and process wastewater production and handling systems and subjects BOH to the risk of enforcement action(s) if they fail to comply with permit conditions. Thus, the permit will protect public trust waters.

Permit re-issuance of the BOH-WPDES permit does not preclude or exempt the permittee from obtaining permits required through other DNR programs or other local, state or federal authority for which impacts on public trust waters will be evaluated. BOH needs to apply separately for a high capacity well approval under s. 281.34, Stats., and for approval of actions which impact wetlands or navigable waterways, under Chapter 30, Stats.

Comment #14: In sand soil such as that in our central sands area, what is the rate at which nitrates seep through the soil?

Response: There are many factors involved with regard to infiltration rates and nitrate leaching within highly permeable sands. Factors include – but are not limited to – manure application timing, soil conditions, temperature, application rate, application type and application method. Irrigation systems also can contribute to leaching. Nitrogen dissolved in water in the nitrate form may be transported to groundwater as water percolates through the soil unsaturated zone to the groundwater table. Soils with a high sand content, such as soils texturally classified as sandy loams, loamy sands and sands, may have very rapid water infiltration rates, ranging from about 2 inches per hour to more than six inches per hour. Under certain soil conditions then, nitrogen in the nitrate form, might rapidly be leached to groundwater.

The Department acknowledges that the BOH NMP depicts planned manure applications on many fields that contain sandy, highly permeable soils. These soils, in general, have a higher risk for leaching of nitrates and other pollutants to groundwater than other soils. For more information regarding water quality protections provided by the nutrient management plan and applications to sandy soils, refer to comment response #29.

Comment #15: A number of comments expressed concerns regarding redevelopment construction activities occurring at the BOH facility before a WPDES permit was re-issued and that prior construction of facilities may lessen Department enforcement response.

Response: Under the terms of the settlement agreement with the Wisconsin Department of Justice (WDOJ), BOH - the successor to OCH - was allowed to redevelop the BOH site to comply with WPDES permit requirements. After the settlement agreement was reached, the DNR approved facility plans for construction of housing, manure storage and a feed pad runoff

collection system at the BOH site, allowing the operation to construct and redevelop the BOH site as allowed by applicable rules. In some instances, changes to design plans and constructed facilities may be required based on public input on the final permit action. However, no changes to approved structures for the BOH facility are necessary based on the final reissued version of the permit.

The Department acknowledges that there have been CAFOs that have had multiple instances of permit noncompliance. However, under these circumstances, the Department has used or is currently using enforcement to get those operations into compliance with their WPDES permit. None of these instances of noncompliance have risen to the level of revoking/denying reissuance of a WPDES permit.

Comment #16: There were a number of comments that expressed appreciation to the Department for granting the request of residents to hold a public hearing on the BOH WPDES Permit.

Response: Comments noted.

Comment #17: A number of comments expressed environmental concerns about BOH being allowed to operate under a reissued WPDES permit based on OCH's compliance history. Others stated their belief that the restructuring of the partnership followed by a name change is the reason the facility was granted an ACL and a WPDES permit.

Response: OCH has existing obligations under the settlement agreement (Stipulation and Order) obtained by the Wisconsin Department of Justice (WDOJ) in August 2013. These obligations, not limited to, but include the establishment of an account in the amount of $17,500, which is limited for use to abandon and replace a private residential well and to continue quarterly groundwater monitoring efforts at the Roberts, Briese and Machan sites - which remain under the purview of the WDOJ with additional coordinated oversight provided by the WDNR. Groundwater monitoring will continue at the three sites for a minimum period of two years from the date each abandonment was completed, after which time, the Department will re-evaluate to determine if conditions warrant further monitoring efforts.

A new partnership (with new partners) was formed in the latter part of 2013 under the name of Burr Oak Heifers, LLC. The BOH Farm was one of the four facilities previously permitted under Opitz Custom Heifers, LLC. A "Stipulation of Permit Acceptance" was signed by the purchaser, (BOH) on September 20, 2013, accepting the conditions and requirements of the existing WPDES permit, until the Department was able to re-issue a new WPDES permit. The BOH WPDES permit covers the BOH production area and any crop fields which will receive manure and/or wastewater generated within the BOH production area. A change in ownership is not uncommon. This is not a new WPDES permitted facility, the name change is simply representative of a newly formed partnership.

There are a number of ways in which the Department monitors a CAFO's compliance with its WPDES permit, including site visits, compliance inspections and review of submitted reports, including quarterly groundwater monitoring reports. The Department is committed to completing at least one full operation inspection during each five year permit term. Other inspections may occur on a more frequent basis due to specific issues at a given operation or in response to citizen's complaints.

It is not within the Department's authority to determine where a given CAFO should be sited. The enforcement action and judgment obtained by the WDOJ resulted in penalties, costs and assessments. Under the settlement, BOH constructed facilities to consolidate livestock under roof on liquid tight concrete with associated structures designed to safely collect and store all manure and wastewater that is generated. The containment structures were designed and constructed to meet or exceed minimum construction standards and were reviewed and approved by the Department. These actions have resulted in a facility which meets WPDES permit requirements and are protective of surface and groundwater quality. The BOH facility has little in common with the OCH operation and past compliance history is not reflective of the improvements that have occurred.

Comment #18: Incompatible soils dictate the use of bio-digesters, methane production and wastewater treatment under the point source pollution requirements. The costs of such actions should be the least concern, as no price can be placed upon a healthy environment.

Response: Storage of manure and process wastewater and subsequent land application of these stored materials is considered the best technology by the U.S. EPA. Pursuant to Chapter 283, Wis. Stats., the Department cannot require more stringent technology based limitations, such as requiring other methods of manure treatment.

Comment #19: Several comments received stated that groundwater monitoring wells should be required within cropland areas utilized by BOH to ensure compliance with NMP requirements and groundwater protection.

Response: Groundwater monitoring associated with CAFO manure/process wastewater applications on cropland is difficult to do effectively to show conclusive results. In lieu of this monitoring, the Department oversees compliance with practices designed to avoid or minimize impacts. The permit as issued complies with Ch. NR 243 and provides an adequate level of water quality protection. Information on permit conditions that protect water quality can be found throughout this document. These permit conditions may actually reduce nutrient loading to groundwater and surface waters in the area. The risk for manure applications to cause contamination of groundwater or surface waters, via groundwater recharge, is effectively reduced by the factors addressed within comment response #29.

Comment #20: What percent did the DNR pay on their (Burr Oak Heifers) facility upgrades?

Response: WPDES Permitted CAFO facilities are ineligible to participate in DNR state cost share funding programs.

Comment #21: I heard nothing at the hearing that satisfied my confidence that monitoring will be done carefully, accurately, and sufficiently often at Burr Oak Heifers. I do not believe that the DNR has this assurance either.

Response: The Department disagrees. The twelve existing monitoring wells located at the four OCH operations were installed in 2004. Per DNR protocol, a certified third party vendor conducts quarterly sampling activities for each of the groundwater monitoring wells. Collected samples are analyzed at the State Laboratory of Hygiene for the parameters identified within the WPDES Permit. Monitoring analysis reports are submitted to the Department to review on a

quarterly basis. The third party vendor system has proven to be an effective tool, as groundwater monitoring provided the Department with the necessary documentation to initiate an enforcement action in 2008 and the subsequent referral to the Department of Justice in 2010.

The nine monitoring wells located at the three abandoned OCH sites (Briese, Machan & Roberts) will continue to be monitored on a quarterly basis for a minimum of two years after each site has been properly abandoned. After a period of two years, the Department will make a determination about future sampling. This activity is under the direct purview of the Department of Justice with consultation from the DNR.

Groundwater monitoring of the BOH monitoring wells will continue on a quarterly basis. BOH is required to construct a minimum of two additional groundwater monitoring wells at locations within the production area that are approved by the Department. The two additional wells will provide more comprehensive monitoring within the expanded BOH production area. BOH groundwater monitoring requirements are contained within the WPDES permit and under the direct purview of the DNR. For more information regarding WPDES permit compliance oversight, reference comment response #17.

Comment #22: Do CAFO cows drink water from on-site wells? If so, is the milk produced tested for nitrates? If so, is there an enforcement standard for nitrates in milk? If so, would increases in any such standard be considered?

Response: Livestock located at the BOH facility are provided drinking water from wells located on-site. BOH is a custom heifer rearing operation - not a dairy livestock milking facility.

Milk production is regulated under the oversight of DATCP. The DNR, consulted with DATCP to verify their regulatory authority. Milk is not routinely tested for the presence of nitrates. Currently, there is not an enforcement standard for nitrates in milk.

Well water utilized for dairy livestock operations, which includes drinking water, is tested for bacteriological quality and must meet the definition of safe water under NR 809, Wis. Adm. Code. The sampling and testing of the water is done by the dairy plant of record for the farm. The applicable enforcement standards include a level of <1 coliform (bacteria) and less than 10 mg/l for nitrates. If these limits are exceeded, the farm must either correct the problem or provide an outside water source which meets the minimum enforcement standard requirements.

Comment #23: Is solid manure safer than liquid manure?

Response: With respect to groundwater contamination, commercial N has a higher risk for leaching nitrate-nitrogen into groundwater than manure. Manure is primarily an organic source of N. Organic N is not immediately plant available (and leachable) and acts as a slow release fertilizer source for plants. Manure organic N must be converted by soil bacteria to a form that is immediately plant available (ammonium and nitrate). Ammonium-N carries a positive ionic charge binds to soil particles. Nitrate nitrogen carries a negative ionic charge and does not bind tightly to soil particles, is highly soluble in water and leaches readily.

While both solid and liquid manure have the potential to significantly impact surface and groundwater resources if improperly managed, liquid manure has a lower solid content and would therefore generally pose a greater risk than solid manure. For example, liquid manure

has an increased risk of runoff when applied on frozen or snow-covered ground. WPDES permit conditions reflect this risk by placing additional restrictions on the handling and spreading of liquid manure when ground is frozen or snow covered.

Comment #24: I am a farmer in the area. It was news to me that heifers produce less urine than milk cows.

Response: Based upon information provided within the Mid-West Plan Service Publication MWPS-18, total manure production (urine and manure) from a 750 pound heifer is estimated at 7.8 gallons/day while a 1,400 pound lactating cow produces an estimated 17.7 gallons/day.

Comment #25: Sensitive water resources near spreading areas must be monitored and protected from potential impacts. There is a potential for impacts to surface water and groundwater associated with spills and land application of manure from the proposed operation. This will impact tourism and sport fishing and threaten public health.

Response: The WPDES permit contains numerous requirements that are protective of water quality.

The purpose of a WPDES permit is to limit discharges. A discharge permit cannot require a permittee to account for inputs to a receiving water other than from the permitted operation. For any in-stream sampling to be effective from a permit enforcement standpoint, it would need to identify not just the presence of a pollutant, but also the source of a pollutant. The department is not aware of any practical way to identify the source of pollutants where sampling is conducted off of a permitted site. The presence of pollutants from other sites can mean that even a positive in-stream sampling result does not implicate a particular permittee absent conclusive information about the pollutant's source.

Accordingly, in lieu of off-site monitoring, the WPDES permit contains several restrictions that require permittees to prevent manure and process wastewater discharges from production and land application areas and minimize nutrient delivery from land application areas. Such restrictions help reduce the risk for manure runoff and nutrient delivery to all surface waters.

With regard to impacts to groundwater quality, the Department does not have authority to require the permittee to monitor private wells and pay for such monitoring nor does the Department have the staff or monetary resources to do such monitoring. As with surface water monitoring, selecting location(s) for off-site groundwater monitoring is difficult to do effectively to show conclusive results. In lieu of this monitoring, the Department oversees compliance with practices designed to avoid or minimize impacts.

The Department believes that as long as the operation adheres to the conditions in the NMP, the risk associated with land application practices to water quality is minimal.

Comment #26: A number of comments expressed concern that the rights of a CAFO owner would take precedence over the rights of neighbors and other citizens and their desire for clean water.

Response: The Department disagrees. WPDES permits for CAFOs are issued in accordance with statutory requirements, including conditions in those permits that protect water quality.

More detail regarding DNR authority is provided in the following comment response.

Comment #27: Commenters questioned if the DNR considers the views of the public/property owners and felt that decisions were being made based on economics and not the negative impacts to the environment on a regional level.

Response: The Department seriously considers and evaluates all comments received on a proposed WPDES permit. In an attempt to provide additional information to people interested in the BOH site, Department staff provided detailed information covering the permit review process for BOH.

Economic impacts, positive or negative, are not a basis for denial of the WPDES permit, nor are they a basis for conditions in a WPDES permit. Potential impacts to the area's surface and groundwater quality and how the WPDES permit addresses these impacts are covered under other comments in this document

Comment #28: The department received a number of general comments stating their opposition to the issuance of a permit to BOH based on (1) potential and actual impacts to the environment (air quality), (2) animal welfare, (3) impacts to the community (e.g., human health, property values, etc.).

Response: The WPDES permit is a water quality protection based permit intended to protect surface water, groundwater and wetlands. The WPDES permit does not regulate air emissions, odor, dust, noise, traffic, lighting issues or animal welfare. The Department cannot deny permit issuance based on non-water quality related impacts or concerns.

In general, under ch. NR 243, the DNR has limited authority to require case-by-case best management practices. Ch. NR 243 and permits issued under this authority already have requirements designed to address issues such as surface runoff as well as a number of other potential surface and groundwater related concerns. In most cases, these requirements are reflected in the WPDES permit and will be the requirements with which BOH must comply.

Comment #29: A number of commenters shared concerns regarding the land application of liquid manure on sandy soils and the potential impacts to area surface waters and groundwater that are already above the state standard for N (10 mg/l). One commenter suggested that the issue warrants additional study before the BOH permit is reissued. Another commenter stated that the NMP is not adequate, particularly for the amount of manure that BOH will be land applying.

Response: The Department shares your concerns as they relate to elevated nitrate levels within private wells in the Central Sands. The completed BOH facility eliminates past nitrate source loading activities resulting from outdoor livestock feedlots. Quarterly groundwater monitoring well analysis of wells located within the production area will provide Department staff the ability to actively monitor current production area activities.

The Department agrees that the BOH NMP depicts planned manure spreading on many fields that contain sandy, highly permeable soils. These soils, in general, have a higher risk for leaching of nitrates and other pollutants to groundwater. The NMP provides additional protection in the timing and application of manure.

The permit as issued complies with Ch. NR 243 and provides an adequate level of water quality protection. Information on permit conditions that protect water quality can be found throughout this document. These permit conditions may actually reduce nutrient loading to groundwater and surface waters in the area. The risk for manure applications to cause contamination of groundwater or surface waters, via groundwater recharge, is effectively reduced by the following factors:

Manure vs. Commercial Fertilizer Properties

- In general, commercial N fertilizers have a higher risk for leaching nitrate nitrogen into groundwater than manure in sandy soils. Manure is primarily an organic source of N. Organic N is not immediately plant available (and leachable) and acts as a slow release fertilizer source for plants. Manure organic N must be converted by soil bacteria to a form that is immediately plant available (ammonium and nitrate). Ammonium-N carries a positive ionic charge binds to soil particles. Nitrate nitrogen carries a negative ionic charge and does not bind tightly to soil particles, is highly soluble in water and leaches readily. Ammonium nitrogen can, under optimum conditions, quickly change to nitrate nitrogen (warm, moist, well aerated soils and with pH of 6.5 – 7.0). Conversion of manure organic N to plant available forms of N requires correct soil temperature (>50 degrees, ideal between 70-75 degrees) correct soil moisture and correct soil oxygen to occur. Conversion of organic N, however, is not an immediate or rapid process. It converts slowly over time during the crop growing season allowing for the applied N from manure to be utilized by established crops. This is key factor when considering risks for manure to cause N leaching into groundwater.

Sand Soil properties and Organic Matter

- Because sandy soils have less organic matter they retain less water compared to medium and fine textured soils. Without adequate moisture in sandy soil, conversion of manure organic N to inorganic plant available N is less likely or rapid compared to commercial N fertilizers. Manure applications to sandy soils will, over- time, help improve sandy soil structure with more organic matter. More organic matter helps a soil, particularly sands, retain more water and this ability helps reduce the risk for leaching nutrients into groundwater. In addition, the BOH NMP also has planned crop rotations that will help create more organic matter than current crops grown in the area.

More Stringent and Enforceable Nutrient Management Regulations / Practices

- The department understands that some groundwater resources in proximity to BOH fields are currently impaired for nitrates and a majority source for such impairment are current agricultural land use/activities. BOH will be required, via the WPDES permit and NR 243, to meet more stringent NMP requirements than vegetable/cash grain fields not under permit coverage. Current agricultural cropping activities in the area either do not have a NMP or do not follow the requirements of a NRCS Standard 590 Plan. Nor are growers in the area required, by state regulations, to have a WPDES permit that regulates how, where and when they apply nutrients (commercial fertilizer) to their fields and discharge to waters of the state. The BOH WPDES permit requires this facility to not only develop and implement the NMP, but also meet strict record keeping. Reporting requirements within the NMP are all enforceable conditions via the WPDES permit. Because BOH is required to meet higher regulatory and record keeping standards for nutrient management than current growers in the area, the department believes fewer nutrients will enter groundwater than area agricultural land not under WPDES permit authority.

Pathogen Movement Risk associated with Sands

- The Department evaluated the risk for movement of pathogens (defined as bacteria, viruses and parasites that cause disease) within sand soils to groundwater associated with manure applications planned by BOH. Land application of manure can contaminate groundwater with pathogens where groundwater is vulnerable to contamination and where conditions allow pathogens to survive and sometimes thrive. The unsaturated zone (the upper soil and sediment layers that have some water in pore spaces) can play an important role in slowing down pathogen transport and survival. This factor must be considered when determining the vulnerability of the aquifer to contamination, particularly with sands. Sandy soils do not support ideal conditions for pathogen survival because they, by definition, have low organic matter and low moisture levels. Pathogens move easily in groundwater when pores and fractures in soil are full of water (referred to as saturated flow). Sands, compared to other soils, do not have fractures and do not support conditions for saturated flow in the unsaturated zone above the groundwater "water table", due to physical and permeability properties.

- In general, sandy soils provide some filtering/attenuation of pathogens due to their physical and high oxygen content properties; aerobic decomposition of pathogens is more possible with sands vs. other soil types, provided conditions for pathogen movement is reduced or minimized. The department has experience with using sands in stormwater and wastewater treatment systems for pollutant removal, including some pathogens. Sands have been used as part of on-site septic systems design to reduce risk for pathogen movement and to increase pathogen attenuation.

BOH NMP Requirements and Procedures

The department approved NMP for BOH has several items that help reduce risks for groundwater contamination, including:

- Procedures for evaluating fields before, during and after applications for restricted or prohibited features, to follow correct setbacks from restricted areas (i.e., wells, wetlands, streams or lakes) and to determine if any manure runoff occurs and for taking immediate corrective action if manure or process wastewater runoff, ponding is identified.

- Planned manure applications are set to not exceed crop nutrient budgets determined in accordance with NRCS 590 standard, UW crop recommendations, the WPDES permit and s. NR 243.14. All manure applications are required to be based upon current manure and process wastewater analyses, soil tests, and other sources of nutrients applied to a field.

- Second year credits are calculated for manure, legumes and other planned nutrient sources applied to fields.

- Daily recordkeeping of all manure and process wastewater applications to fields to track what was actually applied vs. planned.

- Regular collection and analysis of representative samples of land applied manure and process wastewater.

- Reviewing and amending the NMP on, at a minimum, an annual basis to reflect any changes in operations over the previous year (including incorporation of previous years amendments to

actual crops grown, nutrients applied, nutrient concentrations, etc.) and include projected changes for upcoming year.

- Procedures for manure applications to fields with high potential for N leaching to groundwater, soil temperature, application rate and timing restrictions. Such procedures require BOH to either apply manure in the spring, or measure soil temperatures on fields and delay fall applications of manure until soil temperatures fall below 50 degrees F.

Other Conditions within the WPDES Permit
The WPDES permit contains several restrictions that require BOH to manage manure and also apply manure and process wastewater to fields in compliance with the conditions:

- Manure and process wastewater applications may not cause fecal contamination of a well.

- Manure and process wastewater may not be applied within 100 feet of direct conduits to groundwater and within 100' of private wells.

- Land application practices shall maximize use of available nutrients for crop production, prevent delivery of manure or process wastewater to waters of the state, and minimize loss of nutrients and other contaminants to waters of the state to prevent exceedances of groundwater and surface water quality standards. Practices shall retain land applied manure and process wastewater on the soil they are applied with minimal movement.

- Land application practices shall not exceed crop nutrient budgets determined in accordance with NRCS 590 standard, WPDES permit and s. NR 243.14 and shall be based upon manure and process wastewater analyses, soil tests, as well as other sources of nutrients applied to a field.

- Manure or process wastewater may not be applied to saturated soils, nor pond on application sites.

- Construct and then maintain at least 180 days of liquid manure storage.

- The NMP shall be reviewed and amended on an annual basis to reflect any changes in operations over the previous year (including incorporation of previous year's amendments to actual crops grown, nutrients applied, etc) and include projected changes for upcoming year.

- No surface applications of manure and process wastewater on frozen or snow covered ground, except in emergency.

- Collect and analyze representative samples of land applied manure and process wastewater and use such sample results to guide application rates of manure and process wastewater to fields.

Comment #30: Commenters expressed concern that the DNR did not have adequate resources to oversee the CAFO permit program, stating that permittee self-inspections are inadequate and that this should serve as a basis for permit denial. One comment referenced a Wisconsin State Journal investigation that found that the DNR's enforcement of pollution requirements against CAFOs is sporadic at best and usually triggered by citizen complaint.

Response: There are a number of ways the Department monitors a CAFO's compliance with its WPDES permit, including site visits/compliance inspections and review of submitted reports. Other inspections may occur on a more frequent basis due to specific issues at a given operation. It is an ongoing challenge to ensure there is adequate staff and time to conduct these activities. The Department is continually working to find ways to increase the amount of time staff can spend on compliance and enforcement activities. DNR staff also regularly visit CAFO facilities as a result of citizen complaints, compliance issues or random site visits.

The Department does not claim that CAFO WPDES permits are "zero risk" permits. As with any license or permit that is issued, there is always the potential for environmental impacts associated with permit noncompliance or situations not easily or explicitly addressed by prescriptive permit requirements. In these instances, the Department has included general performance measures as permit conditions (e.g., manure may not runoff except under very limited circumstances; a CAFO cannot cause the fecal contamination of water in a well).

The Department acknowledges that there have been impacts associated with CAFOs and that some of those impacts have been significant. However, the WPDES permit program has been an effective means to address these impacts and avoid impacts from occurring in the future.

Comment #31: There are a lot of narrative general conditions in permits for CAFOs and what is needed is a more site-specific approach. If there are geologic features that influence, if there are going to be known surface water discharges, when there is existing high background pollution that could affect public health, where there is a risk of groundwater contamination, these conditions warrant additional site specific regulation and monitoring.

Response: The finalized WPDES Permit includes permit conditions that provide specific requirements that are based on site conditions at the BOH facility. With consideration of the sandy soils present within the production area, the Department recognizes there is an increased risk for groundwater impacts. The Department believes that additional monitoring requirements (groundwater monitoring wells at the production site) are warranted to determine if manure and process wastewater structures/systems have been constructed and are operated properly. The following changes have been made to the permit to reflect these concerns.

- Section 2, a "Production Area Monitoring Requirements" section was added to the permit which identifies groundwater monitoring system parameters within the production area.
- A construction schedule (section 3.3 "Production Area Monitoring-Groundwater Monitoring Well Installation) has been added to the "Schedules" section of the permit outlining the timing of the required installation of additional groundwater monitoring wells within the BOH production area.
- Section 4.2, "Groundwater Standard Requirements", has been added to the Standard Requirements of the permit, pertaining to groundwater monitoring requirements.

With consideration of the more permeable sands, structures at the BOH site were constructed utilizing more stringent construction standards, which includes a layer of compacted clay under-laying the liquid tight concrete.

The BOH NMP, which is a required component of the WPDES permit, has been specifically developed to meet the requirements listed within the WPDES permit and NR 243, Wis. Adm. Code. Additional information regarding the BOH NMP is discussed in comment response

#29.

Comment #32: The groundwater contamination caused by the intensive agriculture in this area is a serious problem. All animal waste permits issued for facilities in this area should be very restrictive to prevent additional contamination. The WDNR should be working in close partnership with the county land and water conservation staff and with NRCS to address this problem so that the long term trend of nitrate pollution of the groundwater is reduced.

Response: The Department agrees that groundwater nitrate levels within the area are a significant concern. BOH is the only active WPDES Permitted CAFO facility within the town of Richfield. The majority of cropland within the Richfield Township does not receive manure applications and is reliant on commercial fertilizer applications.

The BOH NMP provides an adequate level of water quality protection. More specific details regarding the benefits provided by the NMP are provided in comment response #29.

Adams County Land Conservation Staff and the NRCS are conservation partners with the Department, who coordinates conservation efforts with local, state and federal partners on a reoccurring basis.

Comment #33: DNR has implied that they expected the nitrate levels to eventually go down. According to the Groundwater Coordinating Council's report, "Nitrate concentrations are likely to increase in aquifers used for drinking water supplies during the next decade, or longer, as shallow groundwater with high concentrations moves downward into the groundwater system.

Response: Comments made by DNR regarding decreases in N concentrations in groundwater were specifically referring to the production areas of the four operations previously covered under the OCH WPDES permit. These sites include Burr Oak, Briese, Roberts and Machan Farms. All livestock located on outdoor feedlots at these sites have been relocated to housing at the BOH site. The last of the feedlots was abandoned in July 2014, per requirements identified within the court settlement. These sites are, or will be planted to crops to uptake nutrients. Groundwater monitoring wells are located at each of the four facilities. Quarterly groundwater monitoring will continue at these sites for a minimum of two years. Reduced sampling will be considered by the department if it is deemed appropriate based on site conditions at the end of the two year period. Quarterly groundwater monitoring at the BOH site will likely continue indefinitely.

As noted by DNR staff during the Q&A session, the state has limited authority over commercial fertilizer applications on fields not under the authority of a WPDES permit.

Comment #34: The federal Clean Water Act (CWA) requires that states adopt water quality standards to protect waters from pollution. These standards set the water quality goals for a lake, river, or stream by stating the maximum amount of pollutant that can be found in the water while still allowing it to be used for fishing, swimming, and allowing aquatic organisms and wildlife to thrive. Water quality standards are put into place with the use of criteria, or specific quantitative measurements of a pollutant or nutrient such as phosphorus, sediment (total suspended solids), bacteria (E. coli), polychlorinated biphenyls, and mercury. A water is polluted or "impaired" if it does not support full use by humans, wildlife, fish and other aquatic life and it is shown that one or more of the pollutant criteria are not met.

Response: The Department understands concerns about potential impacts to water quality associated with both the production area and land application activities. It is the intent of the WPDES permit for BOH to avoid impacts to human health and exceedances of groundwater and surface water quality standards. There are a number of standard WPDES permit conditions as well as additional restrictions specific to BOH that provide additional levels of water quality protection beyond what is required of operations not under WPDES permit coverage. These restrictions have been adopted in part, in response to practices that have resulted in impacts in the past. While these restrictions and the WPDES permit do not completely eliminate the risk for impacts, they significantly reduce the potential for such impacts to occur.

Comment #35: Under paragraph 1.1 Production Area Discharge Limits, it states "the permittee shall comply with discharge limitations established above and groundwater standards. Repeating that requirement at the end of paragraph 1.1, "Production area discharges to waters of the state authorized under this permit shall comply with water quality standards, groundwater standards and may not impair wetland functional values."

So from the outset the DNR by employing its legislated mandate of wise resource protection, has established nitrate limits on CAFO permittees. And these groundwater standards for nitrates in Wisconsin are 10 ppm.

Response: The Department acknowledges that violations of the production area limits occurred at the BOH facility. Production area discharge issues were addressed when the State of Wisconsin brought a court action against OCH, in which the State sought forfeitures and injunctive relief for the violations of Wisconsin laws that regulate water pollution and violation of the WPDES permit. The settlement resulted in actions by OCH and BOH that led to facility upgraded at the BOH site, which comply with WPDES permit requirements and are protective of surface and groundwater quality.

Regarding concerns related to the groundwater standard for nitrates, reference comment response #1 to review changes made to the finalized WPDES permit.

Comment #36: A commenter expressed concerns about the area around BOH being severely stressed by the presence of high-capacity wells already pumping copious quantities from the aquifer and stating opposition to further risks to the water table as well as in surrounding lakes and streams.

Response: BOH – the successor of OCH - is an existing WPDES permittee and one of the four previous sites permitted under the OCH WPDES permit. The Department does not have the authority to dictate the siting of an operation. The Department does not regulate water quantity issues as part of the WPDES permit. Those issues are regulated under the high capacity well approval statutes and do not serve as a basis for denying a WPDES permit. It should also be noted that BOH has not submitted a high capacity well application during the permit re-issuance process, as existing water supply wells were already in place.

Comment #37: What will be the penalty if there is an increase in (groundwater) nitrates?

Response: As a result of the 2010 DNR referral to the Wisconsin Department of Justice, BOH is required to install a minimum of two additional groundwater monitoring wells on site. The intent of the groundwater monitoring wells is to provide a more comprehensive monitoring network within the production area. BOH is required to continue with quarterly monitoring of groundwater grab samples that are to be analyzed at a state certified laboratory for the parameters identified within Section 2.1 of the WPDES permit. Quarterly reports will continue to be evaluated by Department staff.

With the abandonment and removal of livestock from non-vegetated feedlots, the Department anticipates that groundwater nitrate levels will trend downward. Chapter NR 140 outlines a number of potential response actions that can be required of BOH if groundwater monitoring indicates continued negative impacts to groundwater quality. As with OCH, further enforcement action is possible if necessary and warranted.

Comment #38: What are the depths of the various test wells (monitoring wells)?

Response: The depths of the three existing groundwater monitoring wells at the BOH facility are 58' (MW-1), 59.5' (MW-2) and 66.5' (MW-3). The initial groundwater depth ranges between 46-55 feet. The monitoring wells were constructed between November 17, 2004 and December 2, 2004.

Comment #39: I understand there are currently 3 ACLs that have been established for agricultural facilities in our state. Under what conditions were they granted the exception and what was the history?

Response: Rosendale Dairy was granted a CAFO nitrate exemption/ACL of 17.1 mg/l for Nitrate + Nitrite (as Nitrogen). The nitrate exemption/ACL was established utilizing five years of groundwater monitoring well data and based on background levels from site upgradient groundwater monitoring wells.

Two other WPDES CAFO permits (Richfield Dairy and New Chester Dairy), included permit language stating that after groundwater monitoring wells are installed, the Department would review the groundwater monitoring results and grant an exemption/establish an ACL, if warranted. To date, a nitrate exemption has not been granted for either of these permits.

Comment #40: In our own experience, our utility was forced by the WDNR to drill new drinking water wells at great expense when one of our well's nitrate levels spiked above 10 mg/l. Ironically, it's been suggested the cause was an agricultural fertilizer contamination of an irrigation well, resulting in contamination of groundwater, eventually seeping into the town's well. As a public utility, we are held to a standard by the WDNR that demands the health and safety of the public preempts any other consideration. We feel any business should be held to the same standard.

Response: Public utility drinking water wells and WPDES permitted CAFO operations are held to the same nitrate standard of 10 mg/L, which represents the "maximum" allowable level for drinking water quality and for groundwater quality. However, the regulatory mechanism for applying that 10 mg/L standard is somewhat different.

In the case of public water supply systems, the standard is a ch. NR 809 Safe Drinking Water MCL (Maximum Contaminant Level), a level considered safe for public consumption. Public water utilities are required to provide potable water to their customers that meets established state drinking water quality standards.

In the case of a WPDES permitted facility - such as BOH, the standard is a ch. NR 140 Groundwater Quality ES (Enforcement Standard), which is applied at regulated facilities, practices and activities that could impact state groundwater resources. The business being regulated in this case (BOH – the successor of OCH), has - at significant expense, been required to upgrade its operation, and is being held to a standard that essentially allows no future additional nitrate impacts from the facility above site "background levels"(must meet site specific, "adjusted" ch. NR 140 nitrate ES). This is similar to the public drinking water utility's experience – expensive upgrading to continue to meet nitrate standards (MCL or established site ES ACL).

At both regulated sites discussed in this response (CAFO & Utility), the "background" groundwater flowing onto the site appears to be impacted by offsite agricultural activities over which the Department has limited regulatory authority.

Comment #41: A comment stated that groundwater flow at the BOH site is laminar flow and is stratified, and therefore site monitoring wells "only monitor the groundwater recharging immediately upgradient of the well location".

Response: The Department agrees that, as groundwater flow at the BOH site is through saturated porous media (sandy soils), it is very likely laminar in nature. The Department also agrees that, as soils in the central sand plain area of Wisconsin are generally lacustrine and glacial outwash deposited sands, that groundwater flow is likely stratified to some degree. The Department's position, however, is that without site specific measurements of vertical and horizontal hydraulic conductivities, the degree of groundwater flow stratification at the site cannot be accurately evaluated, and for this reason, it is difficult to estimate how much mixing of background quality groundwater with site impacted groundwater recharge might be taking place. Plumes of nitrogen impacted groundwater in sandy soil environments have been shown to exist in groundwater up to four miles from a source area, and so without extensive groundwater monitoring upgradient of the BOH site, it would be difficult to estimate exactly where the source of the nitrate in site background groundwater originated.

Comment #42: A comment stated that "background water chemistry is irrelevant to what is monitored in downgradient wells" and that there is "little or no mixing of upgradient groundwater with what is present in the recharge originating on the site".

Response: Mixing of upgradient background groundwater with groundwater recharge originating on the BOH site and measured in site downgradient wells, would be a function of dispersive mixing (of these two groundwater flow streams within the aquifer). Without more detailed information about the specific characteristics of site unconsolidated soil geology and accurate measures of local aquifer hydraulic properties, it is difficult to estimate the degree of groundwater mixing that may be taking place and how relevant to background quality downgradient well sample results may be.

Comment #43: A commenter stated that, in assessing the BOH site background groundwater quality, the Department should be "using the water chemistry originating from adjacent woodlands" and that "the true background nitrate concentration in groundwater in this area is less than 2 mg/L".

Response: The Department has attempted to evaluate groundwater flow and ambient background groundwater quality at the BOH site utilizing the facility's existing groundwater monitoring system. Based on groundwater level information and groundwater quality analysis results, it appears that groundwater flowing onto the site may be impacted by upgradient agricultural activities located west/northwest of the site. Aerial photos depict a number of agricultural irrigation systems and crop fields located within this area. A review of private well sampling results from residential wells in the Town of Richfield, indicate levels up to 48 mg/L and suggest that there may be fairly extensive nitrate impacts from agricultural activities in groundwater in the vicinity of the BOH site.