APPENDIX G
ANTI-DEGRADATION REVIEW

ANTIDEGRADATION REVIEW APPLICATION
UTAH DIVISION OF WATER QUALITY

Introduction

The objective of antidegradation rules and policies is to protect existing high quality waters and set forth a process for determining where and how much degradation is allowable for socially and/or economically important reasons.

In accordance with Utah Administrative Code (UAC R317-2-3), an antidegradation review (ADR) is a permit requirement for any project that will increase the level of pollutants in waters of the state. The rule outlines requirements for both Level I and Level II ADR reviews, as well as public comment procedures. This application is intended to assist the applicant and Division of Water Quality (DWQ) staff in complying with the rule but is not a substitute for the complete rule in R317-2-3.5. Additional details can be found in the *Utah Antidegradation Implementation Guidance* and relevant sections of the guidance are cited in this application form.

ADRs should be among the first steps of an application for a UPDES permit because the review helps establish project design expectations. ADRs are also required for any project taking place within a stream channel and for applications to fill wetlands as part of the Army Corps of Engineers 404 permitting process. The level of effort and amount of information required for the ADR depends on the nature of the project and the characteristics of the receiving water. To avoid unnecessary delays in permit issuance, the Division of Water Quality (DWQ) recommends that the process be initiated at least one year prior to the date a final approved permit is required.

This antidegradation application must be completed and approved by DWQ before any UPDES permit can be issued. DWQ will determine if the project will impair beneficial uses (Level I ADR) using information provided by the applicant. The applicant is responsible for conducting the Level II ADR, if necessary. For the permit to be approved, the Level II ADR must document that all feasible measures have been undertaken to minimize pollution for social or economically beneficial projects resulting in any increase in pollution to waters of the state.

Parts A, B, D, and G are required for all permits, whereas Parts C, E, and F are only required for Level II ADRs.

Once the application is complete, it should be signed, dated, and submitted to the DWQ staff member who is responsible for the UPDES permit or 401 Certification.

For additional clarification on the antidegradation application process and procedures, please contact Nicholas von Stackelberg (801-536-4374) or Jeff Ostermiller (801-536-4370).

Antidegradation Review Application

Part A: Applicant Information

Facility Name: Coalville City WWTF

Facility Owner: Coalville City

Facility Location: 100 North, 50 West Coalville, UT (west of Union Pacific Rail Trail)

Application Prepared By: J-U-B Engineers,Inc.

Receiving Water: UNT to Chalk Creek/Echo Reservoir

What Are the Designated Uses of the Receiving Water (R317-2-6)?
Domestic Water Supply: 1C
Recreation: 2B - Secondary Contact
Aquatic Life: 3A - Cold Water Aquatic Life
Agricultural Water Supply: 4
Great Salt Lake: None

Category of Receiving Water (R317-2-3.2, -3.3, and -3.4): Category 3

UPDES Permit Number (if applicable): UT0021288

Effluent Flow Reviewed: 0.50 MGD

What is the application for? (check all that apply)

☒ An application for a UPDES permit for a new facility or project.

☐ An expansion or modification of an existing wastewater treatment works that will result in an increase in the mass or concentration of a pollutant discharged to waters of the state.

☐ A permit renewal requiring limits for a pollutant not covered by the previous permit.

☐ An expansion or modification of an existing wastewater treatment works that will result in an increase in volume discharged over the volume used to obtain previous permit limits.

☐ A proposed UPDES permit renewal with no changes in facility operations.

Part B. Is a Level II ADR required?

This section of the application is intended to help applicants determine if a Level II ADR is required for specific permitted activities. In addition, the Executive Secretary may require a Level II ADR for an activity with the potential for major impact on the quality of waters of the state (R317-2-3.5a.1).

B1. The receiving water or downstream water is a Class 1C drinking water source.

☒ **Yes** A Level II ADR is required (Proceed to Part C of the Application)

☐ **No** (Proceed to Part B2 of the Application)

B2. The UPDES permit is new or is being renewed and the proposed effluent concentration and loading limits are higher than the concentration and loading limits in the previous permit and any previous antidegradation review(s).

☐ **Yes** (Proceed to Part B3 of the Application)

☐ **No** No Level II ADR is required and there is no need to proceed further with application questions.

B3. Will any pollutants use assimilative capacity of the receiving water, i.e. do the pollutant concentrations in the effluent exceed those in the receiving waters at critical conditions? For most pollutants, effluent concentrations that are higher than the ambient concentrations require an antidegradation review? For a few pollutants such as dissolved oxygen, an antidegradation review is required if the effluent concentrations are less than the ambient concentrations in the receiving water. (Section 3.3.3 of Implementation Guidance)

☐ **Yes** (Proceed to Part B4 of the Application)

☐ **No** No Level II ADR is required and there is no need to proceed further with application questions.

B4. Are water quality impacts of the proposed project temporary and limited (Section 3.3.4 of Implementation Guidance)? Proposed projects that will have temporary and limited effects on water quality can be exempted from a Level II ADR.

☐ **Yes** Identify the reasons used to justify this determination in Part B4.1 and proceed to Part G. No Level II ADR is required.

☐ **No** A Level II ADR is required (Proceed to Part C)

B4.1 Complete this question only if the applicant is requesting a Level II review exclusion for temporary and limited projects (see R317-2-3.5(b)(3) and R317-2-3.5(b)(4)). For projects requesting a temporary and limited exclusion please indicate the factor(s) used to justify this determination (check all that apply and provide details as appropriate) (Section 3.3.4 of Implementation Guidance):

☐ Water quality impacts will be temporary and related exclusively to sediment or turbidity and fish spawning will not be impaired.

Factors to be considered in determining whether water quality impacts will be temporary and limited:

a) The length of time during which water quality will be lowered:
b) The percent change in ambient concentrations of pollutants:
c) Pollutants affected:
d) Likelihood for long-term water quality benefits:
e) Potential for any residual long-term influences on existing uses:
f) Impairment of fish spawning, survival and development of aquatic fauna excluding fish removal efforts:

Additional justification, as needed:

Level II ADR

Part C, D, E, and F of the application constitute the Level II ADR Review. The applicant must provide as much detail as necessary for DWQ to perform the antidegradation review. Questions are provided for the convenience of applicants; however, for more complex permits it may be more effective to provide the required information in a separate report. Applicants that prefer a separate report should record the report name here and proceed to Part G of the application.

Optional Report Name:

Part C. Is the degradation from the project socially and economically necessary to accommodate important social or economic development in the area in which the waters are located?

The applicant must provide as much detail as necessary for DWQ to concur that the project is socially and economically necessary when answering the questions in this section. The social and economic importance of publicly owned treatment works (POTWs) are typically considered self-evident and do not require detailed explanation. More information is available in Section 6.2 of the Implementation Guidance.

C1. The facility is a POTW and is necessary for economic and social growth of the serviced community.

☒ **Yes** (Proceed to Part D of the Application)

☐ No (Proceed to Part C1 of the Application)

C1. Describe the social and economic benefits that would be realized through the proposed project, including the number and nature of jobs created and anticipated tax revenues.

C3. Describe any environmental benefits to be realized through implementation of the proposed project.

C4. Describe any social and economic losses that may result from the project, including impacts to recreation or commercial development.

C5. Summarize any supporting information from the affected communities on preserving assimilative capacity to support future growth and development.

C6. Please describe any structures or equipment associated with the project that will be placed within or adjacent to the receiving water.

Part D. Identify and rank (from increasing to decreasing potential threat to designated uses) the parameters of concern.

Parameters of concern are parameters in the effluent at concentrations greater than ambient concentrations in the receiving water. The applicant is responsible for identifying parameter concentrations in the effluent and DWQ will provide parameter concentrations for the receiving water. More information is available in Section 3.3.3 of the Implementation Guidance.

Parameters of Concern:

Rank	Pollutant	Ambient Concentration [1]	Effluent Concentration [2]
1	Biochemical Oxygen Demand -5 Day (BOD5)		
	Summer	0.1 mg/L	<25 mg/L
	Fall	0.1 mg/L	<25 mg/L
	Winter	0.1 mg/L	<25 mg/L
	Spring	0.1 mg/L	<25 mg/L
2	Ammonia-Nitrogen (NH_3-N)		
	Summer	0.03 mg/L	<1.0 mg/L
	Fall	0.03 mg/L	<1.0 mg/L
	Winter	0.03 mg/L	<1.0 mg/L
	Spring	0.03 mg/L	<1.0 mg/L
3	Dissolved Oxygen (DO)		
	Summer	7.24 mg/L	>5.0 mg/L
	Fall	7.24 mg/L	>5.0 mg/L
	Winter	7.24 mg/L	>5.0 mg/L
	Spring	7.24 mg/L	>5.0 mg/L
4	Total Dissolved Solids (TDS)		
	Summer	339 mg/L	500-1000 mg/L
	Fall	339 mg/L	500-1000 mg/L
	Winter	339 mg/L	500-1000 mg/L
	Spring	339 mg/L	500-1000 mg/L
5	pH		
	Summer	8.2 S.U.	6.0 – 9.0 S.U.
	Fall	8.2 S.U.	6.0 – 9.0 S.U.
	Winter	8.2 S.U.	6.0 – 9.0 S.U.
	Spring	8.3 S.U.	6.0 – 9.0 S.U.
6	E-Coli	NA [3]	<126/ 100mL
7	Temperature		
	Summer	15.8 °C	15 °C
	Fall	5.2 °C	12 °C
	Winter	2.3 °C	8 °C

	Spring	9.8 °C	12 °C
8	Nitrate Nitrogen (NO_3-N)	4.0 mg/L(4)	<8 mg/L
9	Total Nitrogen (TN)	NA	<10 mg/L
10	Total Phosphorus (TP)	0.05 mg/L(4)	< 1.0 mg/L
11	Total Suspended Solids (TSS)	90 mg/L(4)	<25 mg/L

(1) Ambient concentrations based on WLA prepared by DWQ.
(2) Effluent concentrations estimated based on design criteria for proposed treatment process.
(3) NA indicates ambient data was Not Available.
(4) Concentration is a Pollution Indicator Target, not an ambient concentration.

Pollutants Evaluated that are not Considered Parameters of Concern:

Pollutant	Ambient Concentration	Effluent Concentration	Justification
Total Residual Chlorine	0 mg/L	0 mg/L	UV disinfection is proposed
Turbidity	NA	~10 NTU	Turbidity levels are expected to be comparable to ambient levels in receiving waters.
Oil and Grease	NA	<10 mg/L	Oil and grease will be effectively removed by the treatment process leaving very low concentrations in the effluent
Metals			Facility does not have any industrial dischargers and biosolids meet Class A/Exceptional Quality requirements indicating low metals concentrations.

Part E. Alternative Analysis Requirements of a Level II Antidegradation Review.

Level II ADRs require the applicant to determine whether there are feasible less-degrading alternatives to the proposed project. More information is available in Section 5.5 and 5.6 of the Implementation Guidance.

E1. The UPDES permit is being renewed without any changes to flow or concentrations. Alternative treatment and discharge options including changes to operations and maintenance were considered and compared to the current processes. No economically feasible treatment or discharge alternatives were identified that were not previously considered for any previous antidegradation review(s).

☐ **Yes** (Proceed to Part F)

☒ **No or Does Not Apply** (Proceed to E2)

E2. Attach as an appendix to this application a report that describes the following factors for all alternative treatment options (see 1) a technical description of the treatment process, including construction costs and continued operation and maintenance expenses, 2) the mass and concentration of discharge constituents, and 3) a description of the reliability of the system, including the frequency where recurring operation and maintenance may lead to temporary increases in discharged pollutants. Most of this information is typically available from a Facility Plan, if available.

Report Name: *City of Coalville Wastewater Facility Plan-Original Draft 2007 and Plan Update 2010.*

E3. Were any of the following alternatives feasible?

Alternative	Feasible	Reason Not Feasible/Affordable
Pollutant Trading	Not Feasible*	*Trading program has not been established*
Water Recycling/Reuse	Yes*	
Land Application	Yes*	
Connection to Other Facilities	No	*Distance to nearest facilities is prohibitive*
Upgrade to Existing Facility	Not Feasible	*Existing facility must be abandoned.*
Total Containment	No	*Cold and wet climate, resulting land requirements would be prohibitive.*
Improved O&M of Existing Systems	Not Applicable	*Existing facility must be abandoned.*
Seasonal or Controlled Discharge	Yes*	
New Construction	Yes**	
No Discharge	No	*Volume of discharge makes this impractical*

* See attachment for further discussion of these alternatives.

** See Facility Plan for discussion of this alternative.

E4. From the applicant's perspective, what is the preferred treatment option?

Coalville City's preferred treatment option is to construct a new mechanical treatment facility on land that the City owns. The proposed WWTF would use similar processes to those at the existing facility which has served the City very well over the past 30 years.

E5. Is the preferred option also the least polluting feasible alternative?

☐ **Yes**

☒ **No**

If no, what were less degrading feasible alternative(s)? Land Application, Recycling/Reuse, Seasonal or Controlled Discharge, Advanced Treatment Processes, Nutrient Trading

If no, provide a summary of the justification for not selecting the least polluting feasible alternative and if appropriate, provide a more detailed justification as an attachment.

Cost Prohibitive- see attached justification.

Part F. Optional Information

F1. Does the applicant want to conduct optional public review(s) in addition to the mandatory public review? Level II ADRs are public noticed for a thirty day comment period. More information is available in Section 3.7.1 of the Implementation Guidance.

☒ **No**

☐ **Yes**

F2. Does the project include an optional mitigation plan to compensate for the proposed water quality degradation?

☒ **No**

☐ **Yes**

Report Name:

Part G. Certification of Antidegradation Review

G1. Applicant Certification

The application should be signed by the same responsible person who signed the accompanying permit application or certification.

Based on my inquiry of the person(s) who manage the system or those persons directly responsible for gathering the information, the information in this application and associated documents is, to the best of my knowledge and belief, true, accurate, and complete.

Print Name: JAMES GOODLEY

Signature: James Goodley

Date: 12/22/11

G2. DWQ Approval

To the best of my knowledge, the ADR was conducted in accordance with the rules and regulations outlined in UAC R-317-2-3.

Water Quality Management Section

Print Name: NICHOLAS VON STACKELBERG

Signature: Nicholas v Stackelberg

Date: 5/15/13

Part E. - Alternatives Analyses

An alternatives analysis of preferred treatment methods has been provided in the City of Coalville Wastewater Treatment Facility Plan originally completed in 2007. The original Facility Plan considered four alternatives, three of which involved changes to the liquid stream treatment process. These alternatives included:

1. No Action
2. Expand Existing Ditch
3. Parallel Aerobic Process- IFAS System
4. MBR process

Each of these alternatives logically assumed the existing facilities and site would continue to be utilized in the future and be expanded or upgraded as necessary. However, the original plan found that the land on which the existing treatment facility is located was actually leased from the United States Bureau of Reclamation (BOR). The 50-year lease began in 1964 and is set to expire in October 2014. The City promptly initiated negotiations with BOR to renew the lease and/or purchase land. After a lengthy period of negotiations, BOR has indicated that they would prefer that the City relocate their WWTF to non-BOR land. Alternatively, the City could retain the existing facility/site if a berm were to be constructed around the existing site to protect the facility during a major flooding event.

As a result of these BOR negotiations, the City prepared an update to the original facility Plan in 2010. This update considered three alternatives.

- Alternative 3- Retain the existing facility and construct a berm around the site's perimeter
- Alternative 4- Construct a new mechanical treatment facility at a new (non-BOR) site using conventional activated sludge treatment with biological nutrient removal, BNR. consistent with the existing process.
- Alternative 5-Construct a new mechanical treatment facility at a new (non-BOR) site using a membrane bioreactor, MBR, process with BNR.

Detailed discussion of these alternatives including design criteria, technical descriptions, capital and O&M costs are presented in the 2010 Facility Plan Update. All of the considered alternatives assume that a mechanical treatment facility similar to that existing (i.e. activated sludge process) would be utilized and that the facility would continue to discharge to the Chalk Creek/Echo Reservoir. These alternatives were considered since they were consistent with the technology that the City already owns and operates which would ease any transition in operating a new facility. In addition, this technology reliably achieves the level of treatment required by the current UPDES permit and can be easily adapted to meet new or stricter limits- particularly for nutrients.

Based on a monetary and non-monetary comparison of these alternatives, Alternative 4 was selected as the preferred alternative. Alternative 3 was not selected for a couple main reasons. First, it limits the ability for future expansion since the facility must be contained within the existing 2.4 acre site. Second,

considerable costs are anticipated for maintenance and replacement of the existing facilities which are nearing the end of their useful service life. Although an MBR facility (Alternative 5) would produce a higher quality effluent, it was not selected due to its higher costs. Both capital and annual O&M costs would exceed those for the selected alternative. This alternative would result in monthly user rates that would far exceed the affordability threshold for the City according to the City's Median Adjusted Gross Household Income, MAGHI. According to R-317-2-3.5(c)(2), this alternative is therefore considered not feasible since user fees would exceed this affordability criterion.

Furthermore, the MBR process does not, in itself, provide nutrient removal. The process would still need to be supplemented with processes for either biological or chemical nutrient removal similar to that for the selected process. Therefore, with respect to nutrient removal the MBR process offered little advantage over the conventional activated sludge/ BNR process. This was a major consideration since nutrients are highly ranked in the Parameters of Concern (TN, NH_3-N, NO_3-N, TP, PO_4-P) and are also expected to be a focus of the forthcoming Upper Weber Basin/Echo Reservoir TMDL. The selected process will be capable of removing nutrients to levels equivalent to that of the MBR at less cost and was therefore preferred.

E5. Other Feasible Less Polluting Alternatives

Other treatment alternatives have been identified as part of the ADR that are potentially less degrading to the receiving water. A description of these alternatives and the reasons why they have not been selected are given below.

Advanced Treatment Processes

With respect to mechanical treatment, a reverse osmosis (R/O) treatment would offer increased removal of pollutants. R/O systems are typically employed in the potable water and industrial wastewater treatment applications where the removal of certain contaminants is required. R/O treatment of municipal wastewater is not widely practiced since it is cost prohibitive. This would also be true in this case; an R/O system would be prohibitively expensive to both construct and operate, resulting in excessive user rates. An R/O system would require 'pretreatment' upstream of the actual R/O membranes which would be one of the final treatment steps. This pretreatment system would essentially be equivalent to the MBR process that was evaluated as one of the treatment alternatives and was the highest cost alternative. Another drawback to R/O systems is the production of a brine solution that is the reject stream from the R/O process. This brine solution is highly concentrated with the removed pollutants and dissolved solids making it difficult and costly to dispose of.

Water Recycling/Reuse

There is potential to reuse the treated effluent rather than discharge. The most probable option for reuse would be to use the effluent for residential and landscape irrigation by introducing it into the City's existing secondary water system. This would require that the effluent be treated to meet Type 1 standards. This would necessitate that the preferred alternative has an additional treatment step

(filtration) to meet turbidity requirements. In addition to treatment, effluent storage and pumping facilities would also be required to implement effluent reuse. The costs for these systems have not been determined however it is obvious that these would be in addition to the costs for selected alternative. These added costs would result in user rates that exceed the affordability threshold established by the MAGI, making this alternative cost prohibitive.

Land Application

Another feasible alternative that could avoid discharge is a land application system. The major elements of a land application system would include; treatment lagoons, storage lagoons and a land application site. The treatment lagoons would provide a secondary level of treatment designed primarily for BOD_5 and TSS removal. This would produce a lower quality effluent than the current treatment system although the effluent would not be discharged to surface waters. Aerated treatment lagoons are envisioned in order to minimize land requirements.

Because of the large land requirements for this system, it would need to be located somewhat remotely from the City, perhaps outside the City limits in the County. A pumping station is therefore anticipated to convey wastewater from the City to the lagoon site.

The climate in Coalville is such that land application could only occur part of the year since the soil will be frozen during the winter. Therefore a large storage lagoon would also be required to hold effluent during periods of no or reduced land application. The City would also need to acquire a large amount of land for the land application site(s). A summary of the major design elements and their design basis and considerations is given in the following table.

Table E1- Design Elements for Proposed Land Application System

Design Element	Design Basis and Considerations
Collection System Modifications	This element is common to all of the alternatives. It includes necessary improvements to the collection system such as a lift station upgrade and alterations to the gravity sewer.
Influent Lift Station and Force Main	Land requirements and floodplain issues will prevent the lagoon and land application system from being located in the City or near the existing site. Potential areas with enough land suitable to support a land application system appear to be located uphill from the existing site- thus a lift station is anticipated. The station will be sized to handle the design peak hour flow of 1.5 MGD. The lift station will be located near the existing WWTF to minimize changes to the existing collection system. A 12" diameter force main will convey the wastewater to the new site. A length of 1 mile has been assumed for the force main.

Design Element	Design Basis and Considerations
Aerated Treatment Lagoons	Treatment of the wastewater will occur in a series of aerated lagoons- 3 lagoons are proposed. Per UAC R-317-3-10 requirements, a minimum 30 day hydraulic detention time has been used as the basis for the lagoons capacity. This results in a total treatment volume of 9.0 MG. Supporting facilities would include headworks, aeration and disinfection systems.
Effluent Storage and Pumping Station	Treated effluent will be stored in lagoons during the winter. The storage requirement is nearly 70 MG. It is proposed that this volume be divided between two lagoons to provide flexibility. The land/surface area requirement for each lagoon will be about 8.0 acres. Taking into account berms and setbacks, 10 acres per lagoon will be used. A pumping station will be required to transfer effluent from the storage lagoon to the irrigation system/application site. The station will need to be relatively large to meet the irrigation requirements- a pumping rate of roughly 1000 gpm is assumed.
Land Application Area	Effluent disposal will occur via land application. It has been assumed that alfalfa will be grown on the fields. Based on the climate and agronomic requirements, a land application area of about 150 acres will be required to dispose of all effluent. A center pivot irrigation system is proposed.

A cost opinion for the systems described above has been developed and is summarized in the following table E2 while the relative advantages and disadvantages of land application are listed in Table E3. Both capital and annual O&M costs were developed for this alternative. Perhaps the greatest challenge for this alternative is acquiring the land needed for a land application system.

Table E2- Cost Opinion for Proposed Land Application Alternative

Cost Item	Value
Collection System Improvements	$900,000
Lift Station and Force Main	$1,300,000
Aerated Treatment Lagoons	$4,000,000
Storage Lagoons and Pump Station	$3,500,000
Land Application Site and Irrigation System	$4,200,000
Total Capital Costs	$14,000,000
Annual O&M Costs	$150,000
Life Cycle Cost- 20 years	$17,600,000

In comparison with the selected alternative, the 20 year life cycle costs for the land application alternative is more costly at $17.6M compared to $14.3M for Alternative 4. This high cost makes this alternative less favorable, since the costs would again exceed the affordability threshold for the City. There are also a number of other concerns with the land application alternative that make it less attractive. These are listed in Table E3 below.

Table E3- Land Application Advantages and Disadvantages

Advantages	Disadvantages
• Eliminates Discharge to Surface Water • Well Proven, Relatively Simple Process To Operate • Low Annual O&M Costs • Hay Production Could Offset Some O&M Costs	• High Capital Costs • Land Intensive • Siting and Approval Issues • Need to Pump to Site • Susceptible to Weather and Seasonal Changes • Lower Effluent Quality- Potential to Impact Groundwater • Change from Existing System- Familiarity

Seasonal or Controlled Discharge

Degradation of the receiving water may be reduced by limiting the discharge of pollutants during critical water quality periods. This is often performed on a seasonal basis with the most critical water periods typically occurring during the summer, but this can vary depending on the receiving waters and pollutant. This alternative would involve holding or limiting the discharge of treated effluent during critical water quality periods or seasons and then discharging during non-critical times. For this alternative it is important to note that the overall loading of pollutants to the receiving water will not change only the distribution of that loading with time will change.

Implementation of this alternative would involve the addition of storage facilities to hold effluent during critical water quality periods. This analysis assumed that effluent would be contained throughout one critical water quality period or season for a total of three months. For a 0.5 MGD design flow, a storage capacity of about 45 MG would be required. The least costly storage option would likely be a lagoon. The budget cost for a 45 MG lagoon is estimated to be approximately $2M, which does not include land purchase or any ancillary facilities.

Land availability to site the storage lagoon would also be a major issue. Land availability and suitability is limited near the proposed treatment plant site, which suggests a remote site for the storage lagoon is probable. This would then necessitate an effluent pumping station and new outfall. Since the costs for these facilities would be in addition to the treatment facility costs, it is apparent that this alternative will be prohibitively expensive. Similar to the alternatives discussed above, seasonal or controlled discharge is considered not feasible since the resulting user charges would exceed the MAGHI. In addition, this

alternative may not be less-degrading since the total loading of pollutants to the receiving water will not be reduced.

Nutrient Trading

Nutrient trading is an alternative approach that has been employed in other states to achieve overall nutrient reductions to receiving waters. Some efforts have been made to establish nutrient trading programs in Utah, primarily in watersheds impacted by a TMDL. To date, as far as is known a nutrient trading program has not been implemented within Utah. Discussion of nutrient trading on the upper Weber River watershed has occurred in the past in response to the original Echo Reservoir TMDL which has since been rescinded. The potential trade was between a new point source that did not have any phosphorus allocation in the TMDL and non-point sources that would be eliminated. Considering this, it does seem that a nutrient trading program is possible for the Upper Weber River watershed; however it is not believed to be feasible in the time frame necessary for Coalville's project. The time and resources needed to work out the details, agreements and approvals required for a trading program are expected to take several years and considerable funding. In contrast Coalville is planning to design their new facility within the next year and is seeking financial assistance to fund the project. Furthermore the planned Upper Weber River TMDL is not expected to be completed until 2013 and would then be expected to undergo a lengthy review and approval process. For these reasons it is believed that, for Coalville's project, nutrient trading is not a feasible less-degrading alternative at this time. In the future, once the new TMDL is available, Coalville could evaluate the possibility of nutrient trading if further nutrient reductions are required.

MAGHI Considerations

The Utah DWQ has established an affordability threshold for sewer service to a typical residential customers or equivalent residential unit (ERU) as 1.4% of the Median Adjusted Gross Household Income, (MAGHI) for that community. The state attempts to maintain sewer service fees at or below this affordability threshold by providing grants and low interest loans to communities undertaking large capital improvement projects related to wastewater infrastructure. The MAGHI used in the Facility Plan Update was $42,304 which translates to a monthly fee/affordability threshold of $49.35/month. If the City were to finance the project themselves through a bond or loan, user rates would far exceed this affordability threshold based on the high costs of the alternatives and relatively few connections/ERU's. The City is therefore seeking financial assistance from UDWQ and USDA-RD in order to lower user rates to the affordability threshold. A cost analysis has been performed to determine the appropriate financing (amounts of grant and loan) needed to bring the monthly sewer rates down to the affordability threshold for the selected alternative- Alternative 4- Conventional Activated Sludge w/ BNR at a New Site. For this alternative, the proposed financing package included a $4.4M grant and a $4.75M loan at 3% for 40 years, which resulted in a sewer fee of $49.45. A comparison of the alternatives was then made by determining the user fees for each based on this financing package, which is presented below in Table E4.

Table E4- Comparison of Monthly Sewer Rates Using the same Funding Package

Alternative	20-Year Life Cycle Costs	Costs to Implement ADR Alternative	Total 20-Year Life Cycle Costs	Monthly Sewer Fee per ERU[4]
3- MBR at Existing Site	$15.76M	--	$15.76M	$59.21
4-Conventional Activated Sludge w/ BNR at New Site	$13.93M	--	$13.93M	$49.45
5- MBR at New Site	$16.29M	--	$16.29M	$61.53
Advanced Treatment Process-Reverse Osmosis[1]	$16.29M	$2.00M[2]	$18.29M	$71.20
Recycling Reuse[1]	$13.93M	$3.53M[2]	$17.46M	$68.40
Land Application[1]	--	$17.60M[3]	$17.60M	$80.20
Seasonal or Controlled Discharge[1]	$13.93M	$2.60M[2]	$16.53M	$62.00

1. Indicates alternative considered as part of Antidegradation Review.
2. 20-year annual O&M costs not included.
3. 20-Year life cycle cost.
4. Considers a financing package of $4.4M grant and $4.75M loan @3% for 20yrs.