STATE OF IDAHO
DEPARTMENT OF
ENVIRONMENTAL QUALITY

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C. L. "Butch" Otter, Governor
Curt A. Fransen, Director

January 16, 2014

Mr. Michael Lidgard
US Environmental Protection Agency, Region 1 0
1200 6th Avenue, OW-130
Seattle, Washington 981 01

RE: FINAL §401 Water Quality Certification for the Proposed Final NPDES Permit No. ID-ID-0023710-0 for the City of Ashton

Dear Mr. Lidgard:

The State of Idaho Department of Environmental Quality (DEQ) received a revised preliminary draft National Pollutant Discharge Elimination Program (NPDES) permit for the city of Ashton's discharge from their existing Wastewater Treatment Plant.

After review of the revised permit, public comments and revised effluent limitation calculations, DEQ submits the final § 401 water quality certification containing an antidegradation review. Also enclosed are a Significance Analysis and Social and Economic Justification, both conducted by the city Ashton.

The enclosed §401 certification supersedes all draft certifications. Please direct any questions to Troy Saffle at 208.528.2650 or troy.saffle@deq.idaho.gov.

Erick Neher
Regional Administrator
Idaho Falls Regional Office

enclosures (3)

c: Doug Conde, Deputy Attorney General, TRIM References
Barry Burnell, Water Quality Division Administrator, TRIM References
Brian Nickel, EPA Region 10, Seattle, w/enclosures
Don Essig, TRIM References
Miranda Adams, TRIM References

Idaho Department of Environmental Quality

Final §401 Water Quality Certification

January 16, 2014

NPDES Permit Number(s): ID-0023710, City of Ashton Waste Water Treatment Plant

Receiving Water Body: Unnamed creek, tributary to Spring Creek

Pursuant to the provisions of Section 401(a)(1) of the Federal Water Pollution Control Act (Clean Water Act), as amended; 33 U.S.C. Section 1341(a)(1); and Idaho Code §§ 39-101 et seq. and 39-3601 et seq., the+ Idaho Department of Environmental Quality (DEQ) has authority to review National Pollutant Discharge Elimination System (NPDES) permits and issue water quality certification decisions.

Based upon its review of the above-referenced permit and associated fact sheet, DEQ certifies that if the permittee complies with the terms and conditions imposed by the permit along with the conditions set forth in this water quality certification, then there is reasonable assurance the discharge will comply with the applicable requirements of Sections 301, 302, 303, 306, and 307 of the Clean Water Act, the Idaho Water Quality Standards (WQS) (IDAPA 58.01.02), and other appropriate water quality requirements of state law.

This certification does not constitute authorization of the permitted activities by any other state or federal agency or private person or entity. This certification does not excuse the permit holder from the obligation to obtain any other necessary approvals, authorizations, or permits.

Antidegradation Review

The WQS contain an antidegradation policy providing three levels of protection to water bodies in Idaho (IDAPA 58.01.02.051).

- Tier 1 Protection. The first level of protection applies to all water bodies subject to Clean Water Act jurisdiction and ensures that existing uses of a water body and the level of water quality necessary to protect those existing uses will be maintained and protected (IDAPA 58.01.02.051.01; 58.01.02.052.01). Additionally, a Tier 1 review is performed for all new or reissued permits or licenses (IDAPA 58.01.02.052.07).
- Tier 2 Protection. The second level of protection applies to those water bodies considered high quality and ensures that no lowering of water quality will be allowed unless deemed necessary to accommodate important economic or social development (IDAPA 58.01.02.051.02; 58.01.02.052.08).
- Tier 3 Protection. The third level of protection applies to water bodies that have been designated outstanding resource waters and requires that activities not cause a lowering of water quality (IDAPA 58.01.02.051.03; 58.01.02.052.09).

DEQ is employing a water body by water body approach to implementing Idaho's antidegradation policy. This approach means that any water body fully supporting its beneficial uses will be considered high quality (IDAPA 58.01.02.052.05.a). Any water body not fully supporting its beneficial uses will be provided Tier 1 protection for that use, unless specific circumstances warranting Tier 2 protection are met (IDAPA 58.01.02.052.05.c). The most recent federally approved Integrated Report and supporting data are used to determine support status and the tier of protection (IDAPA 58.01.02.052.05).

Pollutants of Concern

The City of Ashton discharges the following pollutants of concern: biochemical oxygen demand (BOD_5), total suspended solids (TSS), *E. coli,* total residual chlorine, total ammonia, alkalinity, nitrate plus nitrite, oil and grease, total dissolved solids, total nitrogen, temperature and total phosphorus (TP). Effluent limits have been developed for biochemical oxygen demand (BOD_5), total suspended solids (TSS), *E. coli,* total residual chlorine and ammonia. Both interim and final limits are proposed for total residual chlorine and total ammonia. No effluent limits are proposed for dissolved oxygen (DO), alkalinity, nitrate plus nitrite, oil and grease, total dissolved solids, total nitrogen and TP.

Receiving Water Body Level of Protection

The City of Ashton discharges to an unnamed tributary to Spring Creek, within the Upper Henrys assessment unit (AU) ID17040202SK001_02 (Henrys Fork – Warm River to Ashton Reservoir Dam). The unnamed tributary and Spring Creek are part of water body identification (WBID) unit US-1 in the Upper Henrys Subbasin. The WBID has the following designated beneficial uses: cold water aquatic life, salmonid spawning, primary contract recreation and domestic water supply. Additionally, all waters of the State are protected for aesthetics, wildlife habitat, and agricultural and industrial water supply (IDAPA 58.01.02.100).

The cold water aquatic life and contact recreation beneficial uses in this AU have not yet been assessed (2010 Integrated Report). Unassessed water bodies are provided an appropriate level of protection on a case-by-case basis using available information (IDAPA 58.01.02.052.05.b). Monitoring by DEQ in 2011 indicated no bacteria or temperature criteria exceedances. On the basis of this information, DEQ has determined that the receiving water body is a high quality water body. Therefore, Tier 2 protections, in addition to Tier 1 protections, apply to both the aquatic life use and the recreation beneficial uses.

Protection and Maintenance of Existing Uses (Tier 1 Protection)

As noted above, a Tier 1 review is performed for all new or reissued permits or licenses, applies to all waters subject to the jurisdiction of the Clean Water Act, and requires demonstration that existing uses and the level of water quality necessary to protect existing uses shall be maintained and protected. In order to protect and maintain designated and existing beneficial uses, a permitted discharge must comply with narrative and numeric criteria of the Idaho WQS, as well as other provisions of the WQS such as Section 055, which addresses water quality limited waters. The numeric and narrative criteria in the WQS are set at levels that ensure protection of designated beneficial uses. The effluent limitations and associated requirements contained in the City of Ashton permit are set at levels that ensure compliance with the narrative and numeric criteria in the WQS. DEQ has no information that indicates the presence of any existing uses aside from those that have been designated. Therefore, the terms of the permit ensure that existing uses and the level of water quality necessary to protect existing uses shall be maintained and protected.

High-Quality Waters (Tier 2 Protection)

The tributary to Spring Creek is considered high quality for primary contact recreation and cold water aquatic life. As such, the water quality relevant to primary contact recreation and cold water aquatic life uses of the tributary to Spring Creek must be maintained and protected, unless a lowering of water quality is deemed necessary to accommodate important social or economic development.

To determine whether degradation will occur, DEQ must evaluate how the permit issuance will affect water quality for each pollutant that is relevant to primary contact recreation and cold water aquatic life uses of the tributary to Spring Creek (IDAPA 58.01.02.052.05). These include the following: temperature, BOD_5, TSS, *E. coli*, pH, chlorine, ammonia, alkalinity, DO, oil/grease, nitrogen, and phosphorus. Effluent limits are set in the proposed permit for all these pollutants except temperature, alkalinity, DO, oil/grease, nitrogen and phosphorus.

For a reissued permit or license, the effect on water quality is determined by looking at the difference in water quality that would result from the activity or discharge as authorized in the current permit and the water quality that would result from the activity or discharge as proposed in the reissued permit or license (IDAPA 58.01.02.052.06.a). For a new permit or license, the effect on water quality is determined by reviewing the difference between the existing receiving water quality and the water quality that would result from the activity or discharge as proposed in the new permit or license (IDAPA 58.01.02.052.06.a). Because the City of Ashton is not currently permitted (the previous permit expired and a timely application for a new permit was not made) the City of Ashton discharge is considered a new activity or discharge (IDAPA 58.01.02.010.65).

Pollutants with Limits in the Proposed Permit

For pollutants that will have limits under the new permit, the future discharge quality is based on the proposed permit limits (IDAPA 58.01.02.052.06.a.ii). For the City of Ashton's permit, this means determining the permit's effect on water quality based upon the limits for BOD_5, TSS, pH, total residual chlorine, and total ammonia in the proposed permit. Table 1 provides a summary of the proposed permit limits.

Table 1. Proposed permit limits for pollutants of concern.

Pollutant	Units	Finalized Permit		
		Average Monthly Limit	Average Weekly Limit	Single Sample Limit
Five-Day BOD	mg/L	30	45	—
	lb/day	91	137	—
	% removal	85%	—	—
TSS	mg/L	30	45	—
	lb/day	91	137	—
	% removal	85%	—	—
pH	standard units	6.5 – 9.0		
E. coli	no./100 mL	126		406
Total Residual Chlorine (final)	µg/L	9.0	—	18
	lb/day	0.027	—	0.055
Total Residual Chlorine (interim)	mg/L	0.5	0.75	—
	lb/day	1.5	2.3	—
Total Ammonia (final)	**December - May -**			
	mg/L	2.92	—	7.64
	lb/day	8.89		23.3
	June-November			
	mg/L	1.34	—	3.51
	lb/day	4.08	—	10.7
Total Ammonia (interim)	mg/L	25	34	
	lb/day	76	103	

Because the discharge is treated as a new discharge, and given the comparison of the effluent flow to receiving water flow, the discharge of BOD_5, TSS, *E. coli*, pH, total residual chlorine, and total ammonia as allowed under the limits in the proposed permit will cause an increase in the concentration of these pollutants in the receiving water, and therefore, will cause degradation.

Pollutants with No Limits

There are several pollutants of concern (temperature, DO, nitrogen, and phosphorus) relevant to Tier 2 protection of aquatic life that are not limited and for which the proposed permit also contains no limit (Table 1). For such pollutants, future discharge quality will be estimated from available discharge quality data since the last permit or license was issued accounting for any changes in production, treatment or operation (IDAPA 58.01.02.052.06.a.ii). Because the discharge is treated as a new discharge, and given the comparison of the effluent flow to receiving water flow, the discharge will cause an increase in the concentration of these pollutants in the receiving water, and therefore, will cause degradation.

Alternatives Analysis

In order to determine whether the degradation is necessary, an alternatives analysis must be performed that analyzes alternatives aimed at selecting the best combination of site, structural, managerial and treatment approaches that can be reasonably implemented to avoid or minimize the degradation of water quality (IDAPA 58.01.02.052.08.c).

The City of Ashton provided DEQ with the *Antidegradation Analysis for the City of Ashton WWTP, NPDES Permit # ID-0023710, Step Two: Alternatives Analysis and Social and Economic Justification* (January 9, 2013). In this document, five alternatives were reviewed. All of the alternatives are focused on addressing ammonia in the City's discharge. The proposed new NPDES permit contains ammonia limits that require a higher level of treatment than the City's current treatment facility can provide. The five alternatives reviewed include: (1) current operation—wastewater reuse during the growing season and discharge to surface water in the non-growing season; (2) relocation of the outfall from the current receiving water to the Ashton Reservoir; (3) year-round wastewater reuse; (4) mechanical treatment plant; and (5) fixed film process.

The City of Ashton prefers the fixed film alternative. The current operation does not provide sufficient treatment to meet the new ammonia limits in the proposed NPDES permit, and therefore, is not an option the City can use. The wastewater reuse and mechanical treatment options are not reasonable alternatives given both total cost and cost effectiveness of pollutant reduction. Moving the outfall is, according to the City's estimation, the least costly of the alternatives and would completely remove pollutants from the current receiving water. This alternative, however, would not remove pollutants from the environment, but would instead simply transfer the same load of pollutants to the Ashton Reservoir.

While the fixed film alternative is not the least degrading option for the City, it is the best alternative in terms of cost effectiveness at pollutant reduction. Moreover, unlike relocating the outfall, the fixed film alternative will remove pollutants from the environment. Therefore, considering total costs, cost effectiveness and environmental costs and benefits, selecting the fixed film alternative as the least degrading option that is reasonable is justified (IDAPA 58.01.02.052.08.c.iv(4)).

Social or Economic Justification

As previously noted, the City of Ashton provided DEQ with an Antidegradation Analysis document that included a social or economic justification.

The continued treatment of wastewater is a critical service for the affected community. Without wastewater treatment, the City would face significant environmental and public health consequences, as well as economic impacts. Given these factors, as well as the other information provided by the City in its social or economic justification, DEQ has determined that the degradation that will result from the preferred alternative is socially justified.

Other Source Controls

In allowing degradation in high quality waters, DEQ must assure that there shall be achieved in the watershed the highest statutory and regulatory requirements for all new and existing point sources and cost-effective and reasonable best management practices (BMPs) for all nonpoint source controls (IDAPA 58.01.02.052.08.b). The City of Ashton is the only point source to the unnamed tributary to Spring Creek. The City's compliance with its new NPDES permit will ensure the highest statutory and regulatory requirements for point sources shall be achieved.

Nonpoint sources in the watershed are primarily agricultural. Much of the property surrounding the receiving water is used by the City of Ashton to grow a crop reusing its wastewater pursuant to the reuse permit issued to the City by DEQ (permit number LA-000047-02). Cost effective and reasonable BMPs are identified in the WQS as those set forth in the Idaho Agricultural Pollution Abatement Plan. In addition, the requirements set forth in the reuse permit are considered by DEQ to be cost effective and reasonable BMPs. DEQ has determined that appropriate BMPs as set forth in the Idaho Agricultural Pollution Abatement Plan and in the City of Ashton's reuse permit are being implemented by the agricultural nonpoint sources in the watershed. In sum, there is reasonable assurance that there shall be achieved the highest statutory and regulatory requirements for point sources and cost-effective and reasonable BMPs for nonpoint source control.

Conditions Necessary to Ensure Compliance with Water Quality Standards or Other Appropriate Water Quality Requirements of State Law

Compliance Schedule

Pursuant to IDAPA 58.01.02.400.03, DEQ may authorize compliance schedules for water quality–based effluent limits issued in a permit for the first time. City of Ashton cannot immediately achieve compliance with the effluent limits for ammonia and chlorine. Allowing a compliance schedule for the de-chlorination facility will allow the City to look to a long term chlorine compliance solution that can be incorporated into the main treatment improvement project that will meet the new ammonia limits. Combining these two projects into one and having them constructed at the same time will allow the City to maximize their funding opportunities and be able to accomplish their goals by keeping their construction cost down. The City would be able to use their local money to better leverage other funding sources which will maximize the funding assistance. This will help to keep their sewer rates at a reasonable level for the users. They will be able to save money by having only one bid process that will also save the City engineering costs, bidding costs and other soft costs associated with these types of public works projects. The combined project will have better oversight and assurance for a better finished project. Therefore, DEQ authorizes a compliance schedule and interim requirements as set forth below. This compliance schedule provides the permittee a reasonable amount of time to achieve the final effluent limits as specified in the permit. At the same time, the schedule ensures that compliance with the final effluent limits is accomplished as soon as possible. Interim and final limits for total residual chlorine and ammonia are displayed above in Table 1.

Compliance with the ammonia and chlorine criteria requires a modification to the current discharge. Based on current information, the City and DEQ believe that the least degrading reasonable alternative that will achieve compliance with the ammonia effluent limits is the fixed film option. The City must complete a Facility Planning Study to fully evaluate this treatment option. If a different treatment option is selected through the Facility Planning process, this treatment option can only be implemented if the City of Ashton establishes it is the least degrading option that is reasonable. The final effluent limits must be met within five years and six months of the effective date of the permit. Prior to meeting final limits, the following milestones must be met:

Table 2. Compliance schedule deliverables and deadlines

Deliverable	Deadline
Procure Consulting Engineer for FPS	June 1, 2015
Submit a complete application for a wastewater grant to conduct a Facility Planning Study (FPS) and Environmental Information Document (EID)	June 30, 2015
Execute Engineering contracts for FPS	June 30, 2015
Complete FPS	July 31, 2016
Complete EID	December 31, 2016
Submit Letters of Interest for any needed DEQ or Rural Development loans	November 30, 2016
Complete any required designs selected from the FPS	June 30, 2017
Begin any plant upgrades selected from FPS	August 1, 2017
Complete all construction	November 30, 2018

Additional Monitoring

The City of Ashton must also conduct monthly dissolved oxygen sampling of the receiving water using an EPA-approved method to measure compliance with Idaho's dissolved oxygen criteria.

Other Conditions

This certification is conditioned upon the requirement that any material modification of the permit or the permitted activities—including without limitation, any modifications of the permit to reflect new or modified TMDLs, wasteload allocations, site-specific criteria, variances, or other new information—shall first be provided to DEQ for review to determine compliance with Idaho WQS and to provide additional certification pursuant to Section 401.

Right to Appeal Final Certification

The final Section 401 Water Quality Certification may be appealed by submitting a petition to initiate a contested case, pursuant to Idaho Code § 39-107(5) and the "Rules of Administrative Procedure before the Board of Environmental Quality" (IDAPA 58.01.23), within 35 days of the date of the final certification.

Questions or comments regarding the actions taken in this certification should be directed to Troy Saffle, Idaho Falls Regional Office, at 208.528.2650 or troy.saffle@deq.idaho.gov.

Erick Neher
Regional Administrator
Idaho Falls Regional Office

Antidegradation Analysis
for the
City of Ashton WWTP

NPDES Permit # ID-0023710
Step Two: Alternatives Analysis
and Social and Economic Justification

PROFESSIONAL ENGINEER
REGISTERED
7188
1-10-13
STATE OF IDAHO
DAVID R. SCHIESS

Prepared for the City of Ashton

Prepared by Schiess & Associates

January 9, 2013

This document is the second step in the Antidegradation analysis required as part of the Idaho Department of Environmental Quality's (IDEQ) §401 Water Quality Certification of the City of Ashton's new National Pollutant Discharge Elimination System (NPDES) permit.

This document includes an alternatives analysis as required in the Idaho antidegradation implementation rule (IDAPA 58.01.02.052.08). This document describes wastewater treatment, disinfection and disposal options that considered by the City of Ashton prior to the recent wastewater treatment plant and wastewater reuse improvements project. An additional treatment alternative that targets ammonia reduction in lagoon systems is included. Portions of this alternatives analysis are taken from the Wastewater Facilities Planning Study prepared by the Dyer Group, LLC in November 2005.

The alternatives analysis focuses on ammonia reduction. Ammonia limits in the draft NPDES permit are the most restrictive of all the limits to meet. Chlorine residual limits are also being tightened in the draft permit, but the recent improvements project installed dechlorination facilities in anticipation of the stricter chlorine limits.

Alternatives Analysis

Relocation or configuration of outfall or diffuser

Earlier analysis indicated the problem with ammonia concentrations stems from effluent discharge into Sewer Creek that has essentially no flow. Calculations in Appendix C (in the Dyer report) indicate that ammonia concentrations will not be a concern if the discharge can be made to Henry's Fork (Ashton Reservoir) where tremendous dilution is available.

This alternative would provide for constructing a dedicated discharge pipeline to accomplish this. It would start at the existing wastewater treatment facility and then would follow the Sewer Creek drainage about 0.4 miles down (northward) to the point where the stream crosses under a county road, and would then follow that county road alignment westerly about 1.8 miles to the Ashton Reservoir where a discharge structure would be constructed.

A small pump station would be constructed and the pipeline would be PVC pressure piping from the pump station to the outlet. A pressure sewer would avoid problems with grade, minimize rock excavation, and eliminate the need for manholes and deep excavation if a gravity line were to be constructed. Dechlorination will take place at the end of the existing chlorine contact chamber where it is currently set up.

The estimated cost of this alternative is $900,000 with approximately $6,100 annually for operation and maintenance.

Process changes/improved efficiency that reduces pollutant discharge

Two types of process changes might be implemented to reduce pollutant discharge to the levels necessary to meet the draft permit limits. The first is a conventional mechanical treatment plant. The second is a fixed film process that has been developed specifically for achieving ammonia reduction in lagoon systems.

Mechanical Treatment Plant: "This alternative would include construction of a mechanical wastewater treatment facility. The concept is that with significant water quality restrictions for discharge to surface waters, then construction of a mechanical treatment facility would provide a much higher level of treatment needed to meet such requirements.

With a price tag of $2.3 million, the need to hire at least two full-time operators, high operation and maintenance costs, and the small size and limited resources of Ashton in being able to first construct and then operate and maintain such a facility, this alternative is not likely to be considered feasible." (Dyer Report, 2005) Annual operation and maintenance is expected to be $126,000.

Fixed Film Addition to Lagoons: This alternative would continue to use the floating aerators currently installed in Cell A and Cell B for BOD_5 and TSS removal and add a fixed film process to Cells B and C to achieve ammonia removal.

The fixed film process consists of individual bioreactors that sit submerged on the floor of the lagoon, each with its own air supply. Each bioreactor, known as a bio-dome consists of four concentrically nested hemispherical ABS plastic domes mounted on a concrete base that is 12 inches high to allow water to freely enter the open space at the bottom. The space between each nested dome is at least four inches and is filled with a plastic bio-media which has a high surface area-to-volume ratio. A fine-bubble air delivery system is installed at the base of the bio-dome. Each dome requires 1- 1.5 CFM of air. The introduction of air at the base of the dome provides process air for the biofilm which forms on the plastic media and provides air lift pumping of water from the bottom of the lagoon up through the bio-dome and out a hole in the top of the dome.

The following is a description of the biological process of ammonia removal taken from a report by Kraig Johnson, PhD, PE entitled "Rural Wastewater Treatment Lagoon Enhancement with Dome Shaped Submerged Bio-film Devices". "Biological nitrification is the desired removal mechanism to get rid of ammonium in wastewater, but for suspended growth, the necessary bacteria are suppressed at cold temperatures. The aerated fixed film biomass inside the domes allows nitrifiers to remain active at temperatures down to near freezing".

The installation requires 147 bio-domes divided between Cells B and C. Blowers could be housed in the existing blower building and a 4 to 6-inch airline extended from the blower building to Cells B and C. Disinfection and dechlorination will take place in the existing facilities. The total installation is expected to cost $700,000 and will allow the city to achieve ammonia concentrations in the treated effluent of less than 1.7 mg/L through the winter months. Annual operation and maintenance of the bio-domes and the associated blowers is expected to be $16,200.

Seasonal discharge to avoid critical time periods for water quality

The Ashton WWTP currently discharges only seasonally. The facility land applies treated wastewater during the growing season to manage lagoon levels. Cell C and Cell D are drained in the fall and the treated effluent is land applied to reduce the need for winter discharge. The facility starts discharging when Cells C and D are full, usually about mid-January. Discharge continues until June when the growing season starts and land application can resume.

This alternative is considered the "no action" alternative for Ashton. There is no additional cost to continue this mode of operation, but the city cannot meet their new ammonia limits with this alternative.

Non-discharge alternatives such as land application (Wastewater Reuse)

In order to stop discharging in the winter, the city would need to construct a storage lagoon sufficient to hold approximately six months of treated wastewater. The lagoon would also need to be able to accommodate precipitation during this same time period. The city's 2005 wastewater study estimated a 6-9 acre pond would be required for winter storage.

The existing land application site (77 acres) is adequately sized to accommodate wastewater generated during the summer months. According to the wastewater operator, a dry year requires heavy supplementation from surface water to adequately irrigate the crop. A wet year requires no supplementation.

A wet year controls the size of the land application site. We estimate another 50-80 acres would be necessary to accommodate an additional six months of wastewater flows. Since the existing site is bounded on one side by the wastewater lagoons and on the other by an irrigation ditch, this site is not easily expanded. A new site would be necessary with a pivot irrigation system. Dechlorination would not be necessary with this alternative.

Total cost of this alternative is $2.5 million assuming 50 acres of land could be purchased for $10,000 per acre and a 9-acre pond is constructed. Annual operation and maintenance is expected to cost $18,350.

Offsets to the activity or discharge's effect on water quality

There are no upstream activities that could be modified to adequately offset the effect of Ashton's WWTP discharge on Sewer Creek. It has been noted by the wastewater operators that grazing affects water quality in Sewer Creek. Grazing would be considered a non-point source and to our knowledge the ammonia load from grazing to Sewer Creek has not been quantified. However, it is not expected that the elimination of grazing would be sufficient to offset the ammonia load from the treatment plant in its current configuration.

Cost of Alternatives

Alternative	Capital Cost	O&M Costs	Total Cost over 10 years
1. Relocate Outfall	$900,000	$6,100	$961,000
2. Mechanical WWTP	$2.3 million	$126,000	$3,600,000
3. Fixed Film Process	$700,000	$16,200	$852,000
4. Wastewater Reuse	$2.5 million	$18,350	$2,700,000

Alternative Ranking Based on Cost Effectiveness at Pollutant Reduction

Alternative	Lbs. Removed /year	Annual Cost/lb. removed	Resulting in-stream concentration after full mix
1. Wastewater Reuse	6,383 lbs/yr	$42/lb	0 mg/L (Sewer Creek)
2. Move Outfall	6,383 lbs/yr	$15/lb	0 mg/L (Sewer Creek) 0.01 mg/L (Ashton Res.)
3. Fixed Film Process	6,088 lbs/yr	$14/lb	1 mg/L (Sewer Creek)
4. Mechanical Plant	6,088 lbs/yr	$59/lb	1 mg/L (Sewer Creek)

Although the ranking of the alternatives in the table above is specific to ammonia, the ranking for other pollutants (BOD_5 and TSS) is similar. The land application alternative removes all of the pollutants associated with the WWTP discharge from Sewer Creek. Moving the outfall to Ashton Reservoir shifts the current pollutant loading for BOD_5, TSS and ammonia from Sewer Creek which has a very low assimilative capacity to the reservoir which has much greater assimilative capacity. The fixed film process is similar in cost to moving the outfall. The mechanical treatment plant and land application alternatives are 3-4 times more expensive per pound of pollutant removed than the alternatives to move the outfall or add a fixed film process.

Disinfection was not included in the alternatives above since the ability to dechlorinate was provided and paid for in the last improvements project. With dechlorination, the discharge will not be adding chlorine to the receiving stream whether it is Sewer Creek or the Ashton Reservoir. Dechlorination is not necessary for the reuse alternative.

Identify Environmental Trade-offs

Relocate Outfall

This alternative shifts the current pollutant load from Sewer Creek to the Ashton Reservoir where the assimilative capacity of the receiving water body is much greater. The change in the outfall location helps the city meet expected permit limits, but the environment would no longer benefit from any treatment that may be occurring in Sewer Creek as the stream flows down through the pastures and wetlands prior to combining with Spring Creek. The change would also result in a reduction in flow in Sewer Creek.

Mechanical Plant

A mechanical plant is capable of treating wastewater to a higher standard than aerated lagoons can. The trade-off for improved treatment is higher capital and O&M costs. A mechanical plant is more complex than aerated lagoons and is not always a better option for a small community.

Fixed Film Process

This process utilizes the existing lagoons and will improve water quality in Sewer Creek. The environmental tradeoff is increased power consumption to provide process air to the bio-domes.

Wastewater Reuse

This alternative removes all pollutants associated with the WWTP discharge from Sewer Creek. The growing crop benefits from the nutrients in the wastewater. The environmental trade-offs are that 6-9 acres of farm ground will be taken out of production to be the site of the new winter storage lagoon, and 50-80 acres of farm ground will be restricted in the types of crops that can be grown. Aeration requirements and power consumption might be reduced since treatment requirements for wastewater reuse are often less restrictive than to discharge to a stream.

Wastewater reuse is governed by crop nutrient uptake and irrigation requirements and is not expected to adversely impact groundwater quality.

Affordability

The City of Ashton and DEQ assisted in completing the table on the next page:

Indicator	Year	Data
a) Population served	2010 (US Census Bureau)	1127
b) Number of households	City of Ashton, WW FPS, 2005	630
c) Median Household Income, national	2010 (US Census Bureau)	$51,914
d) Median Household Income, State	2010 (US Census Bureau)	$46,423
e) Median Household Income, County	2010 (US Census Bureau)	$42,523
f) Median Household Income, City	2000 (US Census Bureau)	$39,558 (adjusted to 2010)
g) Major type of employment	Idaho Dep't Labor	Ashton Memorial Nursing Home, Broulim's, Fremont County, Fremont County School District, Dep't Juvenile Corrections, Electric Coop, US Forest Service
h) % of Total Wastewater Flow from Residential & Municipal Sources	City of Ashton, 2012	100%
i) Unemployment Rate, State	Idaho Dep't Labor, Aug 2012	7.4%
j) Unemployment Rate, County	Idaho Dep't Labor, Aug 2012	6.5%
k) Unemployment Rate, City	None Available	
l) Property Tax Revenues	City of Ashton 2012	$ 188,991.00
m) Sales Tax & Miscellaneous Revenues	City of Ashton 2012	$ 84,394
n) Total Gov't Revenues [(l) +(m)]	City of Ashton 2012	$ 273,385
o) Current Market Value of Taxable Property	Fremont County Clerk, 2012	$ 47,507,028
p) Property Tax Delinquency Rate	None Available	
q) Bond Rating – Insured sewer	None Available	
r) Overall Net Debt	City of Ashton 2012	$ 3,978,644

Line f, Median Household Income, City: This information was not yet available from the 2010 census. The city conducted a survey for their block grant application, but did not calculate this number. The median household income from the 2000 census was $30,282. This was adjusted to 2010 dollars using the Bureau of Labor Statistics inflation calculator.

Line k, Unemployment Rate, City: The city does not have a way of calculating this number.

Line p, Property Tax Delinquency Rate: The county collects the property taxes, however they said they do not calculate a delinquency rate.

Line q, Bond Rating – Insured sewer: The city does not have a bond rating, rather they use the Idaho Bond Bank. The City of Rexburg reported they also do not have a bond rating.

The tables on the following pages give the average annualized cost per household for each of the alternatives identified above.

Average Annualized Cost per Household for Alternative #: Move Outfall		
Calculate Total Annual Cost of treatment Option (use new form for each alternative)		
Interest Rate for Financing *(i)*	0.03 (expressed as a fraction)	
Time Period for Financing *(n)*	30 (years)	
Annualization Factor: $\frac{i(1+i)^n}{(i+1)^n-1} =$	0.051	(1)
Total Capital Cost to be Financed	$900,000	(2)
Annual Operating Costs of Project	$6,100	(3)
Annualized Capital Cost [(1) x (2)]	$45,900	(4)
Total Annual Cost of Project [(3) + (4)]	$52,000	(5)
Calculate the Total Annual Cost to Households		
Total Annual Cost of Project (5) x Percentage of Total Wastewater Flow Attributable to Residential and Municipal Wastewater Flows	$52,000	(6)
Total Annual Cost of existing Plant ($) x Percentage of Total Wastewater Flow Attributable to Residential and Municipal Wastewater Flows	$270,724	(7)
Total Annual Cost to Households [(6) + (7)]	$322,724	(8)
Calculate the Average Annualized Cost per Household		
$\frac{Total\ Ann. Cost\ to\ Households\ (8)}{Number\ of\ Households} =$	$512	(9)
$\frac{Ave. Ann. Cost\ per\ Household\ (9)}{Median\ Household\ Income} x\ 100 =$	1.3%	(10)
Current Annual Cost per Household	$430	(11)
Change in Cost per Household [(9) – (11)]	$82	(12)

Average Annualized Cost per Household for Alternative #: Mechanical		
Calculate Total Annual Cost of treatment Option (use new form for each alternative)		
Interest Rate for Financing *(i)*	0.03 (expressed as a fraction)	
Time Period for Financing *(n)*	30 (years)	
Annualization Factor: $\frac{i(1+i)^n}{(i+1)^n-1} =$	0.051	(1)
Total Capital Cost to be Financed	$2,300,000	(2)
Annual Operating Costs of Project	$126,000	(3)
Annualized Capital Cost [(1) x (2)]	$117,300	(4)
Total Annual Cost of Project [(3) + (4)]	$243,300	(5)
Calculate the Total Annual Cost to Households		
Total Annual Cost of Project (5) x Percentage of Total Wastewater Flow Attributable to Residential and Municipal Wastewater Flows	$243,300	(6)
Total Annual Cost of existing Plant ($) x Percentage of Total Wastewater Flow Attributable to Residential and Municipal Wastewater Flows	$270,724	(7)
Total Annual Cost to Households [(6) + (7)]	$514,024	(8)
Calculate the Average Annualized Cost per Household		
$\frac{Total\ Ann.Cost\ to\ Households\ (8)}{Number\ of\ Households} =$	$816	(9)
$\frac{Ave.Ann.Cost\ per\ Household\ (9)}{Median\ Household\ Income} x\ 100 =$	2.1%	(10)
Current Annual Cost per Household	$430	(11)
Change in Cost per Household [(9) – (11)]	$386	(12)

Average Annualized Cost per Household for Alternative #: Fixed Film		
Calculate Total Annual Cost of treatment Option (use new form for each alternative)		
Interest Rate for Financing *(i)*	0.03 (expressed as a fraction)	
Time Period for Financing *(n)*	30 (years)	
Annualization Factor: $\frac{i(1+i)^n}{(i+1)^n-1} =$	0.051	(1)
Total Capital Cost to be Financed	$700,000	(2)
Annual Operating Costs of Project	$16,200	(3)
Annualized Capital Cost [(1) x (2)]	$35,700	(4)
Total Annual Cost of Project [(3) + (4)]	$51,900	(5)
Calculate the Total Annual Cost to Households		
Total Annual Cost of Project (5) x Percentage of Total Wastewater Flow Attributable to Residential and Municipal Wastewater Flows	$51,900	(6)
Total Annual Cost of existing Plant ($) x Percentage of Total Wastewater Flow Attributable to Residential and Municipal Wastewater Flows	$270,724	(7)
Total Annual Cost to Households [(6) + (7)]	$322,624	(8)
Calculate the Average Annualized Cost per Household		
$\frac{Total\ Ann.Cost\ to\ Households\ (8)}{Number\ of\ Households} =$	$512	(9)
$\frac{Ave.Ann.Cost\ per\ Household\ (9)}{Median\ Household\ Income} x\ 100 =$	1.3%	(10)
Current Annual Cost per Household	$430	(11)
Change in Cost per Household [(9) – (11)]	$82	(12)

Average Annualized Cost per Household for Alternative #: Reuse		
Calculate Total Annual Cost of treatment Option (use new form for each alternative)		
Interest Rate for Financing *(i)*	0.03 (expressed as a fraction)	
Time Period for Financing *(n)*	30 (years)	
Annualization Factor: $\frac{i(1+i)^n}{(i+1)^n-1} =$	0.051	(1)
Total Capital Cost to be Financed	$2,500,000	(2)
Annual Operating Costs of Project	$18,350	(3)
Annualized Capital Cost [(1) x (2)]	$127,500	(4)
Total Annual Cost of Project [(3) + (4)]	$145,850	(5)
Calculate the Total Annual Cost to Households		
Total Annual Cost of Project (5) x Percentage of Total Wastewater Flow Attributable to Residential and Municipal Wastewater Flows	$145,850	(6)
Total Annual Cost of existing Plant ($) x Percentage of Total Wastewater Flow Attributable to Residential and Municipal Wastewater Flows	$270,724	(7)
Total Annual Cost to Households [(6) + (7)]	$416,574	(8)
Calculate the Average Annualized Cost per Household		
$\frac{Total\ Ann. Cost\ to\ Households\ (8)}{Number\ of\ Households} =$	$661	(9)
$\frac{Ave. Ann. Cost\ per\ Household\ (9)}{Median\ Household\ Income} x\ 100 =$	1.7%	(10)
Current Annual Cost per Household	$430	(11)
Change in Cost per Household [(9) – (11)]	$231	(12)

Social or Economic Justification (SEJ)

Identify the Affected Community

The residents of Ashton are the most directly affected by the proposed degradation in that they benefit from having a community sewer. The residents of Marysville might also benefit in the future from having community sewer. Residents who border Sewer Creek and utilize the pastures along sewer creek for cattle grazing could be affected by changes in the method of wastewater treatment and discharge from Ashton's wastewater treatment plant. The alternatives that continue to discharge to Sewer Creek will reduce ammonia concentrations in Sewer Creek and improve the overall water quality of Sewer Creek. The alternatives that move the outfall to the Ashton reservoir or reuse the treated wastewater by applying it to a growing crop will reduce wintertime flows in sewer creek.

There are no downstream drinking water intakes that could be affected by the treatment and discharge of Ashton's wastewater. The reuse alternative is not likely to impact groundwater supplies for nearby drinking water wells since reuse is governed by crop irrigation and nutrient uptake requirements.

Important Social or Economic Development Associated with Wastewater Treatment

Ashton's wastewater facilities, including the wastewater treatment plant, provide a necessary service to the residents of Ashton. The residents of Marysville might also benefit in the future from Ashton's central wastewater treatment facilities. Septic systems are suspected contributors to elevated nitrates in the region's groundwater. Ashton's wastewater collection and centralized treatment systems provide improved wastewater treatment over septic systems for the area's residents. The result of this improved treatment is that groundwater quality is likely better than it would be if all of Ashton's residents utilized septic tanks.

The 2005 wastewater facilities planning study anticipated a growth rate of one percent. The design population in the year 2025 was 1,448. The design flow was 200,000 gallons per day. The alternatives identified above have the same design basis. If sewer service were extended to the town of Marysville, the design population would be 1,714 and the design flow would be 226,000 gallons per day.

Prior to construction of the wastewater treatment plant, it is reported that sewage from the city flowed to a small pond at the headwaters of Spring Creek and from the pond with little or no treatment into Spring Creek. The wastewater treatment plant corrected the public health and environmental problems that existed with the discharge of untreated sewage to Spring Creek.

Environmental and Social or Economic Impacts

Although Ashton's wastewater treatment plant discharge is being treated as a new discharge for the purposes of this anti-degradation review, it is in fact a long-established discharge. The proposed limits in the city's draft NPDES permit will require a higher level of treatment than has ever previously been required. Specifically, residual chlorine in the treated effluent will no longer be allowed and ammonia must be nitrified prior to being discharged.

Ashton's wastewater discharge to Sewer Creek, although technically considered a degradation of Sewer Creek, is necessary in order to provide sewer service to the residents of Ashton. The treatment plant in its current configuration is a substantial improvement over past discharge practices in terms of public health and safety and the environment.

There will be no loss of recreation associated with continued discharge from Ashton's wastewater treatment plant. There are no downstream drinking water intakes that could be affected by continued discharge. There is no anticipated adverse impact to fisheries due to continued discharge.

Considering Ashton's discharge is already established and the existing infrastructure has already been funded and constructed, there would be adverse social, economic and environmental impacts if discharge were no longer allowed. The economic impacts of eliminating discharge are illustrated in the reuse alternative outlined above. Eliminating discharge would require significant additional funds which are beyond the capacity of the residents of Ashton to pay.

Continued operation of the city's existing wastewater infrastructure and subsequent degradation of Sewer Creek is necessary maintain the public health, social structure and economic viability of the City of Ashton. It is expected that the treatment and disposal alternatives identified in this report will be developed and evaluated in more detail in a wastewater facilities planning study that is expected to begin in 2013. The focus of the study will be to identify and recommend improvements that will allow the city to meet new ammonia and chlorine discharge limits.