City of Nampa

Wastewater Treatment and Disposal Upgrade

Wastewater Advisory Group

Meeting #2 Summary

September 26, 2011♦ 3:30 – 6 p.m.
Nampa Fire Training Center &
Nampa Wastewater Treatment Plant
33 W. Railroad St.
Nampa, Idaho 83687

Nampa Wastewater Advisory Group
Meeting #2 Summary
Sep. 26, 2011

Overview

The City of Nampa must implement an extensive program to upgrade how treats and disposes its wastewater in order to meet anticipated stricter regulations.

The purpose of the Nampa Wastewater Advisory Group (NWAG) is to provide guidance to the City of Nampa on how best to upgrade its wastewater treatment and disposal system. Nampa must make upgrade decisions by early 2012.

The Nampa wastewater advisory group will work with the city at a high level of involvement and commit time to learning technical information about the upgrade process. The group will be asked to provide input on the upgrade options, funding options and ways to educate residents about water quality issues.

Members of the advisory group will be asked to:

- Actively participate in meetings
- Represent the needs and opinions of their organizations and industries (i.e., residential, business, industry, etc.)
- Spend time learning about technical information
- Review and give input on wastewater upgrade options
- Provide guidance to the city on how best to:
    - Fund the upgrade
    - Involve the public in decisions

WAG Meeting #2 Agenda and Format

The City of Nampa hosted the second Nampa Wastewater Advisory Group (NWAG) meeting on Monday, September 26, 2011 at the Nampa Fire Training Center.

The meeting also included a tour of Nampa's wastewater treatment plant.

The meeting objectives were to:

- Explain how Nampa currently treats and disposes of 10 million gallons of wastewater a day (3.65 billion gallons a year).
- Provide an overview of the upgrade options Nampa is considering.
- Discuss the concept of "level of service" and how this will be applied to the decision-making process.

Agenda:

- Welcome and workshop objectives – Michael Fuss, P.E., Public Works Director, City of Nampa
- The challenge – Steve Burgos, Associate, Brown and Caldwell
- Upgrade options – Steve Burgos
- Level of service – Steve Burgos
- Next steps – Rosemary Curtin/Kate Nice, Public Involvement Consultants, RBCI
- Greg Pearce, Nampa Wastewater Treatment Plant Supervisor, City of Nampa
- Complete tour of Nampa's wastewater treatment plant

Each attendee was provided the following handouts:

- Agenda for NWAG Meeting #2
- PowerPoint presentation for NWAG Meeting #2
- Upgrade Options fact sheet
- Summary of NWAG Meeting #1
- Questions and answers from NWAG Meeting #1
- Up-to-date roster of Wastewater Advisory Group members
- "Questions and Comments" comment form
- "Meeting Evaluation" comment form

Summary of Presentations

Welcome and workshop objectives – Michael Fuss (P.E.), Public Works Director, City of Nampa

Michael Fuss thanked all meeting attendees for coming and continuing to participate in the Wastewater Advisory Group process. During his opening remarks, Michael Fuss discussed the following:

- The first NWAG meeting had great participation and there were many questions that were asked. The packet of materials provided to each meeting attendee includes a handout with questions and answers from the first NWAG meeting.
- Several new members have joined the NWAG since the last meeting.
- NWAG Meeting #2 will include a tour of Nampa's wastewater treatment plant.
- The presentation will include:
    - A review of the regulatory environment that Nampa is required to operate under, the challenges of these regulations and what Nampa does to address them.
    - A description of the upgrade options that Nampa is considering.
    - An outline of what Nampa will do next to meet these challenges and upcoming regulations.

Meeting materials – Rosemary Curtin, Public Involvement Consultant, RBCI

- Each team member should have a binder that was provided by the City. NWAG members are encouraged to bring their binder to every meeting to keep and organize their handouts and materials. If an NWAG member has not received a binder, please contact Kate Nice from RBCI, kate@rbci.net, (208) 377-9688.
- The handout packets include a meeting agenda, questions and answers from the first NWAG meeting, an updated roster of the NWAG, fact sheets, the PowerPoint presentation from NWAG #2 and comment sheets.
- NWAG members are encouraged to fill out and return the comment sheets. The comment sheets are very important to the process.

The challenge – Steve Burgos, Associate, Brown and Caldwell

Steve thanked the meeting attendees for coming and helping to contribute to the complex issue of upgrading Nampa's wastewater treatment system. He explained that he has been working with the City for the past two years as Nampa has been evaluating how to best upgrade its wastewater treatment and disposal system. Steve presented the following information:

- The National Pollutant Discharge Elimination System and (NPDES) permit is a regulatory action, but the real challenge is that Nampa generates 10 million gallons of wastewater a day from residents, industries and commercial businesses.

- Nampa's current flow of 10 million gallons a day would be equivalent to filling a football field approximately 30 feet deep of wastewater daily. It is projected that within the next 25 years, Nampa's wastewater flow will double to 7.3 billion gallons a year, which would equate to filling a football field approximately 60 feet deep with wastewater each day. This is a significant amount of wastewater that must be treated and appropriately discharged.
- Without treatment, the City would be discharging raw sewage and raw industrial waste into Indian Creek, which would eventually flow to the Boise River.
- Discharging raw sewage is neither legal nor appealing. Under the Clean Water Act, the City is required to treat its wastewater before discharging it into Indian Creek. Because Indian Creek is a waterway of the U.S., Nampa is required to operate under an NPDES permit, which is regulated by the Environmental Protection Agency (EPA).

Upgrade options – Steve Burgos

- The city has two primary alternatives for discharging its treated wastewater. The City can choose either to:
    - Continue discharging its treated water into Indian Creek. This option requires the City to operate under regulations set by the Environmental Protection Agency.
    - Stop discharging its treated wastewater into Indian Creek and apply the treated water to land (this options is defined as *infiltration).*
- In order to narrow down a preferred upgrade option, the City has been evaluating the two discharge options described above. The City began its evaluation with over 40 upgrade options. Over the past year, the range of options has been narrowed down to five primary options.
- The City is evaluating the risks and benefits for each upgrade option. The risks and benefits will be tied back to the City's priorities and analyzed based on the core values and objectives stated in Nampa's comprehensive and strategic plan.
- Based on the evaluations to date, the five primary upgrade options that Nampa is considering are:
    - *Option #1: Direct infiltration* – The level of treatment would be increased to a very high level at the plant. The treated water would be piped away from the plant and applied to constructed basins and ponds where it would infiltrate back into the groundwater.
    - *Option #2: Rapid infiltration* – The level of treatment would be increased to a high level at the plant. The treated water would be pumped away from the plant and applied to a series of basins. The basins would be designed to further cleanse the water by using the soil ecosystem to absorb pollutants and organic compounds. After being cleansed through the soil, the treated water would infiltrate back into the groundwater.
    - *Option #3: Treat and Offset* – Upgrades would be made at the plant to treat wastewater to certain levels and water would continue to be discharged into

Indian Creek. To meet stricter regulations, Nampa would remove pollutants at an alternate location through an enhanced wetlands process and "trade" the pollutant credits generated.

- *Options #4: Upgrade the Treatment Plant* – Substantial upgrades would be made at the plant and water would continue to be discharged into Indian Creek. To meet stricter regulations, upgrades would include adding chemical and biological processes to remove pollutants that are harmful to waterways.
- *Option #5: Do Nothing More* – Continue current processes for treating and disposing Nampa's wastewater but do nothing more. This option would violate the Clean Water Act and have severe, negative implications for the City of Nampa.

Steve presented the following information about the **infiltration** option:

- When evaluating the option of infiltration, one of the key criteria for applying treated wastewater to land is that it can only be done in areas that met certain criteria such as no underlying basalt, a low groundwater table, no steep slopes and the soil is permeable.
- The primary difference between direct and rapid infiltration is that direct infiltration assumes there will be no treatment in the soil column. Therefore, direct infiltration would require that the water be treated to a very high level at the plant.
- Direct infiltration would require that wastewater be treated to a Class A level at the plant before it is applied to land. Rapid infiltration would require treatment to a Class C level at the plant because it would assume there would be additional treatment in the soil column.
- Based on Idaho's recently updated water regulations, Class A water is the highest classification of recycled water. It can be used for residential irrigation and food crops. Class C is still a very high level of treatment, but less than Class A. Class C water can be applied to fiber crops, but not food crops, and it cannot be used for residential irrigation.
- Some examples of characteristics that distinguish Class A and Class C are the levels of total nitrogen and nitrates, suspended solids and total solids that are allowed for each level.
- The City will be meeting with residents that own pieces of land with the characteristics necessary for infiltration to be successful. Over the next few months, Brown and Caldwell will be testing the soil in these locations to determine if infiltration is a viable option.
- The City has met with Canyon County's commissioners and development services to discuss the possibility of infiltration. The City will continue to be open and transparent as this option continues to be investigated.
- Nampa has had six meetings with the Idaho DEQ to inform them about the infiltration option and make sure they are aware of where the City is in the process.
- Rapid infiltration would require the basins be given time to dry out after each treatment so the soil can recover. This would require rotation of the basins, which would require a large amount of land that could be upwards of 200 acres. Direct infiltration would require

less land because no rotation would be required so all the basins could be used at the same time.

- Additionally, for rapid infiltration there is a regulation that required a 500 foot buffer zone between the basins and the closest residential site. Direct infiltration would not require a buffer zone because the water would be treated to a high enough level that it would be safe for human contact.
- If infiltration is the preferred option, Idaho's DEQ will require that the City thoroughly monitor the infiltration site to ensure the quality of groundwater and underlying soil is not degraded. Infiltration sites that have already been established in California and Arizona show that, if done properly, applying treated wastewater to land has not degraded the quality of the groundwater and underlying soil.
- The benefits of infiltration include:
    - Wastewater could be turned into a resource for the City.
    - The influence of the EPA could be minimized. If Nampa conducted infiltration year-round at a site far enough away from Indian Creek, the City could argue that it is no longer impacting waters of the U.S. By not discharging into a waterway of the U.S., the City could possibly have more flexibility with the EPA.
    - The aquifer south of Lake Lowell could be recharged. Currently, this aquifer is depleted because it was over-appropriated.
    - An additional water supply could be added to the City's resources. If the price of water becomes more expensive in the future, Nampa could redirect the water sent to the aquifer into a Class A, residential irrigation system.
    - Treated water could potentially be used as a draw for economic development that could entice new businesses and industries to come to Nampa.
    - The infiltration basins could be designed to create an area for wildlife habitat.
    - Rapid infiltration could potentially be less expensive because it would require less treatment at the plant; however it could be more expensive than direct infiltration if a large amount of land is required.
- The risks of infiltration include:
    - Finding a site with the right soil conditions.
    - There is the possibility this option could be received negatively by the public.
    - Regulatory approvals are uncertain because an infiltration project on this scale has not yet been done in Idaho.
    - Acquiring right-of-way to build a pipeline to the infiltration site could be a challenge.
    - There would have to be a higher level of engagement from an operation and reliability standpoint.

Steve presented the following information about the **treat and offset** option:

- Treat and offset would be similar to the concept of pollutant trading. Treat and offset is also known as a non-point source treatment project.
- The concept of treat and offset is that the majority of phosphorus pollution in the lower Boise River comes from agricultural drains. For treat and offset, the City would identify an agricultural drain (for example, Mason Creek or Indian Creek) that is high in phosphorus. The City would build an enhanced wetlands at a location along the drain to remove the excess phosphorus. The City would receive credits for removing phosphorus at this agricultural drain and the credits could be applied to Nampa's wastewater treatment plant.
- The City of Boise is currently in the process of proposing a treat and offset project called the Dixie Drain Project. Brown and Caldwell is providing technical and regulatory assistance on Boise's Dixie Drain project.
- For this option, some upgrades would still need to be made to Nampa's wastewater treatment plant. However, because of the phosphorus removal credits the upgrades would not be as significant as they would be when compared to the option of removing all phosphorus at the treatment plant.
- After treatment through the enhanced wetlands, the water would flow out from the enhanced wetlands and back into the waterway it was diverted from. The enhanced wetlands would require building a diversion channel, a sedimentation basin, wetlands, and chemical addition to remove phosphorus from the agricultural drain.
- Treat and offset would potentially be less expensive than the option of removing phosphorus only at the treatment plant. It would also have more environmental benefits and a smaller carbon footprint because it would be a natural system.
- Brown and Caldwell team members have implemented treat and offset projects for stormwater systems in other states, such as Florida. Using enhanced wetlands to trade credits for wastewater has not yet been approved by the EPA, therefore there is some regulatory uncertainty with this option. If Boise's Dixie Drain Project is approved, this will set a precedent for wastewater treat and offset projects.
- The benefits of the treat and offset option include:
    - It could be less expensive.
    - Building an enhanced wetlands would have environmental benefits and could possibly provide habitat for wildlife.
    - It would clean up pollution from agriculture that would otherwise go untreated.
    - The enhanced wetlands would be simple to operate and allow for phased expansion.
- The risks of the treat and offset option include:

This is not a long-term solution.

    - One of the potential limitations with this option is that it will likely be a temporary solution to the phosphorus issue. Currently, phosphorus levels in Indian Creek and the lower Boise River are high due in large part to agricultural

runoff. However, the amount of phosphorus from agricultural drains will be reduced in the future as irrigation practices become more efficient and urban growth reduces the amount of farmland. As this occurs, the City will likely have to consider other options to remove phosphorus.

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- There is regulatory uncertainty and the offset ratio has not yet been determined.
- The City would need to obtain water rights to divert the water from the stream into the enhanced wetlands.
- Irrigation districts may not want NPDES regulations on flows in agricultural drains.
- Treated wastewater would still be discharged into Indian Creek rather than being used as a resource for the City.

Steve presented the following information for the option of **only upgrading the wastewater treatment plant**:

- Based on the new NPDES permits that have been issued to other cities, Nampa anticipates its new permit will require that water discharged from its treatment plant must only contain 0.07 mg/L on total phosphorus within the next ten years.
- The phosphorus levels must be reduced from the treatment plant in order to improve the health of the Snake River and Boise River.
- For this option, the City would continue to discharge its treated wastewater into Indian Creek. Substantial upgrades, such as chemical and additional biological processes, would be made to the treatment plant to lower phosphorus to extremely low levels.
- The benefits of only upgrading the treatment plant would include:
  - The regulatory framework is very certain because upgrading the treatment plant is how Nampa has always responded to new permit regulations.
  - There is known technology that will remove the phosphorus to the new required low levels; however the City would be walking a very fine line because this low level will take significant operational effort.
  - The upgrades could be built on a phased timeline.
- The risks of only upgrading the treatment plant would include:
  - Since Nampa would still be discharging its treated wastewater into Indian Creek, the City would be subject to changing NPDES requirements.
  - The process reliability of meeting the very low levels of phosphorus is challenging.
  - The City would be disposing its treated wastewater instead of using it as a resource.
  - There would be increased waste production and sludge production.

- The process to reduce phosphorus to low levels would require adding an very large amount of chemicals to the water.

Steve presented the following information about the **do nothing more** option:

- This option takes into account all the negative implications that Nampa would face if the City does not upgrade its wastewater treatment system.
- If Nampa does not upgrade its wastewater treatment system it would be committing willful negligence of the Clean Water Act.
- The benefits of the "do nothing more" option are:
  - Benefits are unclear at this time.
- The risks of the "do nothing more" option include:
  - The City would be in violation of the Clean Water Act.
  - There would be significant penalties and fines (at a minimum, the fines would be start at $27,500 a day for each non-compliance related to the permit).
  - There would be large legal bills.
  - City staff and city council could be imprisoned.
  - It would likely result in a moratorium on growth. If the City does not meet permit requirements, the regulatory agencies would not approve any new connections to the city's sewer system.
  - Nampa could be perceived negatively if it does not properly treat its wastewater.

Level of Service – Steve Burgos

Steve presented the following information about how the City will analyze the upgrade options:

- The risks and benefits of each option will be quantified, assigned a value and a net present value analysis will be conducted.
- The basis for analyzing the risks and benefits of each option will be the concept of "level of service." Level of service can be defined as "what are the expectations of the ratepayer?"
- The City needs to evaluate its values and future goals. The decision of which option is chosen will align with the goals, objectives and core values laid out in the City's comprehensive plan.
- The concept of level of service can be illustrated in the example of deciding which kind of car to buy. If the only factor that people cared about was the lowest price, everyone would drive Yugos. However, some people buy sport utility vehicles because they value more storage space and the ability to drive in the mountains. Others buy sports cars because they value speed and the aesthetic components of the vehicle.

- During the evaluation, the management team will apply the concept described above. The factors that will be reviewed are:
    - Citizens' measurement of satisfaction.
    - Values that are important to the community.
    - How the City plan to meet their core values and future goals.
    - Determine how the City measures success at meeting core values and future goals
- The City and engineering management team does not have one option that they prefer over the other, they only want to find the option that best fits Nampa's community.

Next Steps – Rosemary Curtin, Public Involvement Consultant, RBCI

Rosemary thanked the working group members for attending and participating in this complex process. She presented the following information about what working group members can expect for the next step in the process:

- The working group will be given the opportunity to tour Boise's Dixie Drain treat and offset project. The date of this tour will likely be Oct. 13. Please note on your comment form if you would like to participate in this tour.
- The next NWAG meeting (#3) will be held on Oct. 19. Invitations will be emailed to NWAG members within the next few weeks.
- Please fill out and return your comment forms to Kate Nice at RBCI. You can email comments to kate@rbci.net or mail your comment form to 1945 Wildwood, Boise, ID 83713.

NWAG #2 Questions and Answers

Below is a compilation of all the questions that were asked during NWAG Meeting #2 and questions that were submitted on comment forms. The answers include responses that were given at the meeting and additional information the project management team has added to clarify a point or more accurately answer a question.

Regulatory

It seems that we are spending a significant amount of money, but is all this going to make any difference?

The treatment plant is currently discharging a high level of total phosphorus. It's fair to say that the City does need to reduce their phosphorus. However, when you look at the large picture of the watershed, there will be some benefits. There are still significant loads that are not being treated.

Is there an environmental risk of the "do nothing more" option?

Yes. The Snake River and Boise River would continue to receive significant phosphorus loading form the City's wastewater treatment plant that could result in algae growth locally and within the watershed.

Is it true that treating Nampa's water will only correct two percent of the phosphorus problem in the Snake River and Boise River?
It depends on the models that you look at and the EPA and cities each have their own model. It's probably fair to say that the agricultural sources are the major source of the phosphorus pollution. Based in information provided by the IDEQ in the 2008 Lower Boise River Phosphorus Implementation Plan, 62% of the phosphorus in the lower Boise River is associated with Agricultural runoff. However, because agriculture is considered a non-point source of pollution, the EPA cannot regulate the amount of phosphorus they discharge into waterways of the U.S.

When you do the cost-estimates, will you evaluate both scenarios of reducing to 0.5 mg/L and also reducing to 0.07 mg/L?
Yes. We're looking at a phased approach where the City could delay capital expenditures and will also evaluate the best method of how to fund these upgrades.

Will Nampa City Council ultimately make the decision about which option is chosen?
Yes, the City Council will make the decision.

Is phosphorus the only big concern?
Currently, phosphorus is the concern because of specific water quality impacts and the pending stringent permit requirements. However, there are emerging contaminants of concern that will likely be regulated in the coming future such as temperature, microconstituents, and others that the City will likely have to meet.

Aren't some cities limiting the amount of phosphorus in detergents?
Yes. In the Spokane area, there are restrictions on the use of detergents with phosphorus. This helps limits the amount of phosphorus in the treated wastewater but this is only a small portion of the overall loading.

What is the current (phosphorus?) flow of Indian Creek?
Based on information provided by the City WWTP staff, the average instream flow in Indian Creek upstream of the WWTP from April 2010 through October 2011 was 56 cfs. The average effluent discharge flow from the WWTP for the same time period was 15 cfs. This equates to average WWTP contribution to total flow in Indian Creek of approximately 21%.Indian Creek is not a WWTP effluent dominated stream. Effluent dominated streams are characterized by water bodies that rely on a WWTP effluent discharge that comprises more than 50% of instream flows.

How are phosphates removed from wastewater?
There are many treatment option for the removal of phosphorus. The most common is biological treatment to remove as much phosphorus as possible. However, biological treatment alone is not enough to meet the stringent limits being proposed by EPA. Therefore, additional or tertiary treatment processes are needed such as chemical addition to precipitate out the remaining phosphorus not removed by the biological process.

Are there any regulations or treatments for micro-constituents (i.e., estrogen or drugs that pass through the human body into wastewater)?
Not yet. The EPA has identified microconstituents as an emerging contaminant of concern that will likely be regulated in the future.

How will the different options meet future EPA requirements?
One of the challenges facing the City is that if it continues to discharge to Indian Creek, it will face the evolving and uncertain regulatory environment. So the options that keep the discharge in the creek (Treat and Offset, Treat to EPA Levels, and Do Nothing More) will have to meet current and future EPA requirements. The infiltration options may not have to meet these requirements. Initially, the infiltration option would only occur in the summer months since the currently proposed phosphorus limits are only seasonal (from May – September). However, if EPA requirements become more stringent year round, the City could always choose to infiltrate year round to limit EPA impacts.

Infiltration

Can you land apply in the wintertime?
Yes, infiltration could be conducted during winter. For direct infiltration, the water would pond up to raise the temperature so it wouldn't freeze. Infiltration during the winter would be a technical issue that would have to be evaluated further.

How would you get the water from the treatment plant to the infiltration site?
The water would be transported through pipes from the treatment plant to the infiltration basins.

Would the pipes go under the roads? Would you have to dig up roads or properties to build the pipes?
Yes, the pipes would likely go under roads. We would try to go under streets in order to follow existing right-of-way.

What size pipe would it take to get the water out to the infiltration site?
The pipe size depends on estimates of future flows. It could be as large as 48-inches in diameter for build-out conditions associated with rapid growth.

Would old gravel pits be a good site for infiltration?
Gravel pits could be a conducive site since gravels are highly permeable and would allow the recycled water to infiltrate quickly.

How many acres do you think infiltration would take?
It's highly dependent on the type of soils at the proposed site. If we find gravels, or a soil with high permeability, it may take only 10 to 20 acres. If we find soil that is not as permeable we might need 200 acres. That is one reason why the City is starting the site investigation process in the coming months so it can narrow down the potential sites that would be conducive and better develop cost estimates for the options.

Could Nampa partner with other wastewater disposers if it builds an infiltration site? Could the infiltration site be a shared resource with Canyon County?

This could be a possibility. At this point, the City has only been focused on addressing the issues for its own wastewater treatment plant.

Do the infiltration basins have to be open? Or can it be covered with something like a parking lot or event center?
They are usually open because we try to make the construction and operation as simple and cost effective as possible. That suggestion isn't an impossibility, but it could complicate the design, construction, and operation process and make the infiltration options more expensive.

What level does phosphorus have to be reduced to for land application?
Total phosphorus is neither a primary or secondary constituent in the groundwater rule, so from this perspective total phosphorus would not be regulated. However, one of the key criteria for locating the infiltration basins is the offset from waters of the United States. The basin would have to be located far enough away to reduce immediate groundwater/surface water interaction. Based on the location, the City may have to reduce phosphorus to some level but not as low as required if the City continues to discharge to Indian Creek. The City would have to install a process to remove nitrogen from the water before it is applied to land. If needed, this process could potentially be used to reduce phosphorus as well.

Could there be more than one infiltration site?
That would be a possibility. One benefit of having multiple sites is that it would ensure reliability. However, the logistics of identifying, purchasing, constructing, and operating multiple smaller sites are much more difficult than identifying just one site that could handle all of the flows.

Can't we just use injection wells to get the water into the aquifer?
The use of injection wells for wastewater is regulated by IDAPA 58.01.03 "Individual/Subsurface Sewage Disposal Rules." Currently, the regulations do not allow the use of injection wells for human contact wastewater.

For rapid infiltration, does the non-treatment at the plant offset the cost of the treatment in the soil?
Potentially. The City is still studying how this balances out based on the quality of the soil and the size of the land that must be purchased. This will be one of the key factors evaluated when we analyze the potential infiltration sites.

Why is a 500-foot buffer zone required for rapid infiltration?
There needs to be a buffer zone because the Class C water would not be treated to a high enough level to for direct human contact. The 500-foot buffer provides an area for soil treatment prior to coming into contact with an adjacent property and potentially an irrigation or potable well.

Are the costs of monitoring the water factored into your evaluation for infiltration? Won't consistently monitoring the water make rapid infiltration more expensive?
These costs are part of the evaluation. We're trying to balance the costs and benefits of rapid infiltration versus direct infiltration. Rapid infiltration is starting to look less favorable because of additional regulatory requirements.

Would factors like temperature and living organisms in the soil be monitored in the infiltration basins?
Temperature would not be an issue with groundwater. We would only monitor the quality of groundwater in and around the site through samples taken from a network of monitoring wells around the infiltration site. The City will be required to develop a model estimating the impacts and loadings of various pollutants in the soil column.

What is the water in the aquifer south of Lake Lowell being used for now?
The water is being used primarily for agricultural uses. There are many wells that also provide water for domestic use.

Has Nampa ever historically land applied its treated wastewater?
No. A infiltration project on this scale has not yet been done in Idaho.

Is it possible to have a combination of land application and continue discharging into Indian Creek?
Yes. As currently being proposed, the City would only infiltrate during the irrigation season when the stringent phosphorus limits are active (May – September). During the rest of the year, the City would continue to discharge to Indian Creek. There is value in having and maintaining an NPDES permit, for example, it gives the City significant and reliable discharge capacity. However, as NPDES permits limits become more stringent on other constituents or if the phosphorus limit turns into to a year round limit, having the infrastructure in place to pursue infiltration year round gives the City flexibility and would allow the City to avoid the additional costs of WWTP upgrades to meet emerging limits.

Does Nampa already have land to build an infiltration site? Would the City have to purchase land to build the infiltration site?
No, the City does not already have land to build an infiltration site. If infiltration is found to be the preferred option, the City would pursue purchase of land to build the infiltration facility. We are about to begin analyzing the characteristics of potential sites to see if they are conductive to infiltration.

How exactly does the soil remove pollution from the wastewater? What kinds of pollution would be removed through the soil? What happens to the pollutants once it leaves the water and is transferred to the soil?
The rapid infiltration option includes additional removal of pollutants in the soil column. A rapid infiltration system is managed by repetitive cycles of flooding, infiltration and drying. Rapid infiltration of wastewater is based on a relatively high rate of wastewater infiltration into the soil followed by rapid percolation, either vertically or laterally away. Particulates, BOD, trace metals and suspended solids are removed at least in part at or near the soil surface. Pathogen removal by infiltration rapid systems can be as high as 99.99%, with less attenuation occurring in coarser sands and gravel. Nitrification-denitrification is the primary nitrogen removal process. Total nitrogen removal efficiencies for rapid infiltration systems are approximately 50%, and more nitrogen may be removed by using special management practices.

Aerobic bacteria deplete soil oxygen during flooding periods, so resting/re-aerating the system is required for the system to properly function.

How much would infiltration raise the water table?
We could possibly see groundwater mounding in the range of 15-20 feet. This number would depend greatly on soils types. One of the key criteria to narrow down the sites is the depth of the vadose zone or the unsaturated zone between the ground surface and the groundwater table. For infiltration to be successful, the City is estimating that the vadose zone needs to be more than 50 feet deep.

Where is groundwater typically located below the city?
Groundwater is typically shallow under the city. This is one of the main reasons we are looking outside the city limits for potential infiltration sites. The other primary reason is that the City's underlying geology is primarily basalt which is very difficult to develop a groundwater model for and therefore, difficult to permit.

With treatment in the soil, do you need to add bio-additives so the soil can keep pulling out the pollutants?
Based on operation of infiltration sites in other parts of the country, the soil usually has a excellent capacity for removing organic compounds and pollutants. Part of the regulatory review process would be modeling the impacts of long-term infiltration on the soil column and groundwater quality.

As the basins dry out, does the soil have to be removed? Or does bio-chemical application treat it enough?
The soil does not have to be removed as it dries out.

I assume that the decision between direct infiltration and rapid infiltration is dependent on what kind of soil you find?
Yes but also on the ability to get a rapid infiltration basin of this scale to cost effectively meet all regulatory requirements.

What is the cost of monitoring the infiltration basin for direct and rapid infiltration?
There will be annual monitoring costs associated with sampling from monitoring wells and laboratory analysis. No detailed cost estimates on monitoring have been developed to date but will be in the coming months.

Water Classifications

What does "highly treated" mean? What do they use to "highly treat" the water?
We are using "highly treated" only as a way of describing and communicating the differences between current conditions, Class C recycled water, and Class A recycled water.
Class A recycled water is treated using processes that include oxidation, clarification, filtration, and disinfection. Class A water can be used for things such as ground water recharge and irrigation of residential landscape as well as all of the Class C water uses. Class C recycled water is treated using processes that include oxidation and disinfection. Class C water can be used for

things such as irrigation of all non-food crops and industrial, commercial, and construction purposes.

Is Nampa treating its wastewater to Class A now?
No. Significant upgrades would have to be made to the wastewater treatment plant to treat to Class A. Currently, Nampa's treated wastewater doesn't meet the nitrogen requirement to fit into any classification of recycled water.

Would treating to Class C for rapid infiltration be less expensive than treating to Class A for direct infiltration?
Yes when considering upgrades required at the plant. However, treating to Class C for rapid infiltration could be a more expensive from a land purchase perspective as it would require that the City purchase a larger amount of land. These two factors will be balanced while evaluating the options.

Before I moved to Nampa, I lived in Meridian and had my own well and septic system. Every year I would take water to have it tested and all the results showed was if it was okay or not okay. What classification do homeowners with septic tanks treat to?
Homeowners with septic tanks do not treat to a specific classification. The classifications are used only for recycled water from municipal wastewater treatment facilities.

Most of the water the City uses for irrigation now is out of Wilson Creek or the New York Canal. Are we being told right now that water is 2.2 mg of coliform when it is not? I think some of that water is well water isn't it? It's not a Class A water is it?
The City does not maintain water quality data for Wilson Creek or the New York Canal.

We were told on the tour that the flow discharged into Indian Creek is 20 fecal coliform/100 mL, and that Indian Creek itself upstream is 400 fecal coliform/100 mL. Is this correct?
Yes, this is correct. The average fecal coliform concentration in Indian Creek upstream of the WWTP during August was 408 organisms/100 mL. For the same time period, the average fecal coliform concentration in the WWTP effluent was 20 organisms/100 mL

Has there been a test on the irrigation ditches? How much coliform are we pumping right now through the public irrigation system?
The City does not maintain water quality data for the irrigation ditches. It is likely that irrigation water would net meet recycled water standards, but specific data would be required to verify this.

Why is the City required to treat to a high level if the irrigation districts are not?
The agricultural community's return flows have historically been exempt from meeting specific discharge criteria under the Clean Water Act. In the regulatory framework, agriculture is referred to as "non-point discharge sources" and currently, nonpoint source discharges are not required to obtain NPDES permits. .

Could Nampa possibly offer three grades of water (irrigation, recycled and fresh well water)?
Potentially. The City did a study on what it would take to upgrade its current pressurized irrigation to a Class A reuse system. The study concluded that it would be very expensive to make this upgrade today, but it might be more cost-effective in the next 20 to 30 years as the price of water potentially increases.

How expensive would it be to treat the wastewater to Class A?
It can be expensive. Treating to Class A for direct infiltration would be comparable to the option of only upgrading the plant and continuing to discharge into Indian Creek. However, while the City would be spending about the same amount of money, with direct infiltration the City would have the added benefit of turning the water into a resource rather than discharging it to the creek.

Is Class C Water free of pathogens?
No, Class C water, as with all water produced by WWTPs, is not free of pathogens. Class C water is regulated to less than 22 organisms/100 mL for a five-day median value based on the Recycled Water Rules (IDAPA 58.01.17).

Will the Class A and Class C classification change in the next 20 years?
Certainly the classifications can change and become more stringent. However, based on federal priorities and recent regulatory history, it is likely that the recycled water and groundwater regulations that govern the infiltration option will be less dynamic than regulations governing surface water discharges.

What chemicals are used to get the water to Class A? Where do the chemicals come from and where would they be stored?
There are many chemicals that can be used. Detailed discussion of this information will occur in the upcoming NWAG meetings..

Treat and Offset

For treat and offset, what is your phosphorus measurement? What are you trying to reduce?
The measurement of phosphorus would be at the inlet to the enhanced wetland the re-measured at the outlet to confirm the correct amount of phosphorus is being removed. The assumption for the amount reduced is that the City would get its new NPDES permit and in that permit we expect the first interim limit to be 0.5 mg/L for total phosphorus in 5 years and the 0.07 limit in 10 years. The City would likely be required to upgrade the WWTP to meet the 0.5 mg/l limit before being allowed to pursue an offset. The City would then attempt to "treat and offset" the amount of phosphorus reduction associated with the jump from 0.5 mg/l to 0.07 mg/l. Depending on the flows at the treatment plant, this number would range from between approximately 50 to 100 lbs TP per day.

For Nampa, would the offset be upstream in Indian Creek or are they treating for discharge to the Snake River? Or would it be to the Boise River?
That is still to be determined. As of now, the potential agricultural drains to treat have been narrowed down to Indian Creek and Mason Creek. The exact location of the facility is to be

determined but would likely be located downstream of the WWTP but prior to the discharge of the drain to the Boise River.

Reuse

The City of Meridian recycles some of its wastewater. How do they treat their wastewater?
Yes, the City of Meridian treats a small portion of their total flow to Class A Recycled Water standards. The City then applies recycled water to parks and open spaces so it has to be treated to a high enough level for human contact.

You talk about the 10 million gallons of wastewater a day that is going to the plant. Has there been any talk of limiting the amount of wastewater going into the plant? For example, can't people reuse their own shower water to water their lawn?
Nampa is obligated and responsible for treating all the wastewater that is generated and sent to its wastewater treatment plant. Grey water is wastewater generated from domestic activities such as laundry, dishwashing, and bathing, which can be recycled on-site for uses such as landscape irrigation. The use of grey water, or water is a concept that has not been put to use on a large scale. Currently, there is a limited regulatory framework to support such a concept on a large scale. In addition, to put such a use in practice would take significant time and retrofit of existing systems. This schedule would likely not support the deadlines associated with the NPDES permits.

Isn't there a building in Boise that uses a grey water system?
The Banner Bank building downtown uses a grey water system. The building collects rainwater from a specific block of streets in downtown Boise and mixes it with grey water from sinks for reuse in the building. The water is used to flush toilets throughout the building.

Did the idea to reuse water for Nampa's pressurized irrigation go away?
No. The infiltration options would set the city up to transition to reuse for irrigation in the future when the costs are more competitive. Currently, the availability and low cost of water doesn't support the conversion of the existing pressurized irrigation system to a reuse irrigation system.

Could reused water be applied to crops?
Depending upon the level of treatment, yes, recycled water can be used on crops. Class A levels are required for use of the recycled water on food crops. Lower levels are required for use on fodder or fiber crops.

Is it typical to have redundancy?
Specific levels of redundancy are required for different levels of treatment and processes. For example, Class A reuse requires that an alternative disposal option or enough storage be provided to hold out of specification water. Different processes within the wastewater treatment plant also have different redundancy requirements. For example, the blowers used to provide oxygen to the nitrification basins are designed assuming the largest blower is out of service. This assumption provides a redundant blower for the system.