



# Infiltration Options

## Questions & Answers

The City of Nampa needs to make extensive upgrades to its wastewater system. Currently, water from Nampa's plant is discharged into Indian Creek. One upgrade option being considered is to apply the recycled water over land rather than dispose of it into Indian Creek – this option is known as infiltration.

Infiltration is being used in many other western states to recycle water but has not yet been used at this scale in Idaho. Managing wastewater through the method of infiltration is a process that would not only cleanse wastewater, it would have the added benefit of turning the recycled water into a resource for our community.

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### Commonly asked questions and answers about infiltration:

#### Overview

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#### **Q How does Nampa currently treat its wastewater?**

**A.** Nampa's wastewater treatment plant is one of the largest in the state and treats approximately 10 million gallons of wastewater each day generated by residents, businesses and industries. Wastewater is thoroughly treated at Nampa's wastewater treatment plant then discharged into Indian Creek.

having excessive algae blooms caused by too much phosphorus. The Environmental Protection Agency will require Nampa to reduce the amount of phosphorus Nampa's wastewater treatment plant is allowed to discharge. Reducing the amount of phosphorus discharged by the plant will require significant upgrades. If Nampa stops discharging wastewater into Indian Creek, fewer upgrades would potentially be required at the treatment plant to remove phosphorus.

#### **Q Why can't Nampa just continue to discharge its treated water into Indian Creek?**

**A.** It can. However, the federal Clean Water Act requires Nampa to meet standards for discharging treated water into Indian Creek. Indian Creek is a tributary of the Boise River and Snake River, both of which have been identified as

#### **Q What are the upgrade options being considered by Nampa?**

**A.** The City has been evaluating many upgrade options over the past year and has narrowed the possible options to the five described below. All of these options are still under thorough

## Infiltration Options

evaluation and equal consideration. The upgrade options being evaluated are:

- **Option #1 and #2: Infiltration** – Treated water would be applied to an area of land rather than discharged into Indian Creek. Clean recycled water from the City's plant would be pumped offsite and released into a system of basins and/or ponds, then slowly infiltrated back into the aquifer south of Lake Lowell. Two methods of infiltration are being considered:
  - **Option #1: Direct infiltration** would increase the level of treatment to a very high level at the plant. The clean recycled water would be pumped away from the plant and applied to constructed ponds where it would infiltrate back into the groundwater.
  - **Option #2: Rapid infiltration** would increase the level of treatment to a high level at the plant. The clean recycled 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 nutrients. After being thoroughly 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 water to certain levels and water would continue to be discharged into Indian Creek. To meet stricter regulations, Nampa would remove pollutants from Indian Creek at an alternate enhanced wetlands location.
- **Option #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 to the plant would include adding chemical and biological processes to remove pollutants that are harmful to waterways.
- **Option #5: Do nothing more** – Refuse to upgrade the treatment plant to meet more stringent requirements and continue current processes for treating and disposing Nampa's recycled water. This option would violate the federal Clean Water Act and likely have severe, negative implications for the City of Nampa.

### Q **Are other communities using infiltration to manage their wastewater?**

**A.** Infiltration is being used in many other western states to recycle water and keep it readily available for other uses. Infiltration is currently used by communities and cities such as Olympia, Washington, Mesa, Arizona and Orange County, Fresno and San Bernardino in California. Locally, many small cities throughout Idaho use infiltration to dispose of their treated water.

### Q **Why is Nampa considering infiltration?**

**A.** Choosing infiltration as the City's discharge option could have many benefits both for Nampa and Canyon County. Infiltration would turn treated water into a City resource that could potentially be reused for residential, commercial, and agricultural irrigation. The availability of this water has the potential to help economic development both in Nampa and Canyon County. Furthermore, the water that is applied to the infiltration basins will help recharge the depleted aquifer. Additionally, infiltration would minimize the influence the EPA has on the City's wastewater program. Finally, infiltration basins could possibly be used as a recreation or habitat area.

### Q **What do you mean it can "recharge the aquifer?"**

**A.** Infiltration involves applying highly treated water to land. After the clean recycled water is applied to the land, it percolates downward through the soil. Eventually, the water that has been applied to the land will reach the aquifer south of Lake Lowell.

### Q **How will it be determined if infiltration is a real possibility?**

**A.** Specific site conditions are needed for infiltration to be effective. The City has identified several locations in Canyon County where infiltration could possibly work. A professional management team will be testing the site characteristics in these locations to determine if infiltration is a possibility.

# Infiltration Options

## Site Investigation

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**Q Who will be conducting the site investigations?**

**A.** The City is working with a team of wastewater and hydrogeologic experts from several consulting firms to evaluate all upgrade options. The team of engineers is being led by the firm Brown and Caldwell. Brown and Caldwell is very experienced with wastewater management and has planned and implemented infiltration systems for communities in other states, such as Washington, Georgia, Florida, Arizona and California.

**Q What will be analyzed and how?**

**A.** The site investigations will analyze a number of different site characteristics including soil types, soil permeability depth to groundwater, and groundwater quality. The investigations will be conducted by drilling several test wells at each site to determine the underlying soil, geology, water depth and water quality. The soil and geology at the site will be determined by collecting subsurface samples while each test well is being drilled. Should favorable geology be encountered, permanent monitoring wells will be installed. The water depth and quality at the site will be determined by sampling the water removed from the monitoring wells.

**Q When and where will the site investigations be conducted?**

**A.** The site investigations will begin the winter of 2011 and each investigation will take approximately 2-3 weeks per site to complete. There are many potential locations in Canyon County where infiltration could possibly work. Brown and Caldwell have identified several locations south of Lake Lowell between Skyline and 12th Avenue. The City is working with the property owners to test sites this winter.

**Q Will site investigations be conducted on private property and is the testing safe?**

**A.** The site investigations will occur on properties in Canyon County. Property owners have already been contacted about the City's interest.

Neighboring properties will not be affected. The engineering team will ensure the tests are conducted with the utmost safety and sensitivity to the surrounding community.

**Q Will they have to dig up a lot of earth for the site investigations?**

**A.** Initially, the site investigations will only consist of well drilling and possibly monitoring well installation. However, if favorable conditions are identified, additional investigations will occur. For example, several small pits may be dug on the site to determine the soil permeability. These test pits would be approximately 2 to 6 feet in depth.

**Q Will you test the well water of surrounding properties?**

**A.** No. Off-site wells will not need to be tested as part of this effort. The data collected on-site will be sufficient.

**Q I think my property could be a possible site for infiltration. Who do I contact?**

**A.** The City is very interested in talking to all property owners. Infiltration sites must meet specific criteria. If you would like to speak with someone contact Robert Andherst at (208) 440-6565.

## Infiltration Operations

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**Q Why can't the infiltration site be within Nampa city limits?**

**A.** Infiltration sites need to have a large contiguous land area with the right types of soil in order to be effective. In addition, there needs to be a minimum distance between the ground and the underlying water table of 50 feet. Finally, the site should not have any underlying basalt. Sites with large enough areas of contiguous land with more than 50 feet between the ground and water table and no basalt were not identified within the Nampa city limits. Therefore, Nampa looked at sites within Canyon County that could possibly meet key criteria to make the infiltration option feasible.

## Infiltration Options

**Q If infiltration is determined to be the preferred option, when would the infiltration system be built?**

**A.** The City is currently looking at a phased approach for upgrading its wastewater system. There is a significant amount of work that will need to be completed before an infiltration system could be put in place. It is too early to answer this question.

**Q How will the water get from the treatment plant to the infiltration site?**

**A.** Implementing one of the infiltration options would require constructing a pump station and a pipeline from the plant to the infiltration site. The water would be pumped from the plant through this pipeline to the infiltration site.

**Q How will the infiltration system work?**

**A.** Both infiltration options being considered, rapid and direct, work in essentially the same manner. Clean recycled water would be pumped from the City's treatment plant and applied to large basins. The water applied to the basins would slowly infiltrate through the soil at the bottom of the basin and back into the aquifer. The difference between rapid and direct infiltration is the necessary amount of additional treatment in the soil column. Direct infiltration assumes no treatment in the soil column. Therefore, water can be applied to a direct infiltration basin continuously. Rapid infiltration assumes additional treatment in the soil column. To achieve this soil column treatment, the basin must be cyclically filled and drained, thus requiring more land area. In addition, the rapid infiltration basins would require a 500-foot buffer from the closest property.

**Q How much land is needed for infiltration?**

**A.** The land area required depends greatly on the types of soil found on the site and specifically the soil permeability. Considering the range of soil conditions, rapid infiltration could require between 60 to 600 acres of land and direct infiltration could require between 20 to 300 acres of land.

**Q Will the City purchase land for infiltration?**

**A.** Yes. If the City selects infiltration as its discharge option, the City would pursue purchase of property for the infiltration sites.

**Q What would the infiltration site look like?**

**A.** Infiltration sites would look like large, gravel-lined ponds. Direct infiltration ponds may at times be filled with water. Rapid infiltration ponds would likely have no standing water.

**Q Will infiltration be a year-round treatment process?**

**A.** No. Near-term, infiltration would only be used during the summer when the City is subject to phosphorus limits at the plant. In the future, the infiltration basins could be used year-round if the phosphorus limit is extended to a year-round limit or requirements associated with other regulated constituents become too costly to meet.

## Benefits

**Q How would infiltration help Nampa and Canyon County?**

**A.** Choosing infiltration as the City's discharge option would have many benefits both for Nampa and Canyon County. Both infiltration options would turn clean recycled water into a City resource that could potentially be reused for residential, commercial and agricultural irrigation. The availability of this water has the potential to help economic development, both in Nampa and Canyon County. Furthermore, the water that is applied to the infiltration basins will help recharge the depleted aquifer south of Lake Lowell. Additionally, infiltration would minimize the influence the EPA has on the City's program. Finally, infiltration basins could be used as a recreation or habitat area.

## Infiltration Options

### **Q Explain the process of how infiltration recharges the aquifer?**

**A.** Infiltration involves applying the clean recycled water to the land. After the water is applied to the land, it percolates downward through the soil. Eventually, the water that has been applied to the land will reach the aquifer south of Lake Lowell. Therefore, the water applied to the infiltration site “recharges” the aquifer.

### **Q Exactly what would be going into the aquifer?**

**A.** Clean recycled water which has infiltrated through the soil would go into the aquifer. The Idaho Department of Environmental Quality will require that the water meet stringent limits to maintain the existing groundwater quality in the aquifer.

### **Q Could water from the infiltration sites be used for irrigation?**

**A.** Initially, infiltration would be used to recharge the depleted aquifer south of Lake Lowell. If water becomes a more valued commodity for the Treasure Valley in the future, Nampa could redirect the water sent for aquifer recharge to a pressurized irrigation system during the summer for residential and commercial irrigation.

### **Q Could the infiltration basins be used for recreation or wildlife habitat?**

**A.** Yes. The infiltration basins would provide the potential for a recreation site or wildlife habitat depending on the type of infiltration used. There is a potential for creating a natural area with walking paths and trails. Direct infiltration basins could potentially be used for recreation or wildlife habitat. Rapid infiltration could only be used for wildlife habitat because, based on the level of treatment at the plant, the Recycled Water Rule would restrict human contact.

## Potential Concerns

### **Q Is it safe to apply treated wastewater to land?**

**A.** Yes. Recycled water is safe to apply to land and this has been done successfully throughout the United States and Idaho.

### **Q Could groundwater be polluted by infiltration?**

**A.** No. The Idaho Groundwater Rule would regulate the water applied to the infiltration basins and ensure that the groundwater is not polluted.

### **Q How often will the groundwater be tested?**

**A.** The groundwater surrounding the infiltration site would be continuously monitored to ensure the City is meeting the state groundwater quality requirements.

### **Q Is there any possibility that wastewater could filter into my well or onto my land?**

**A.** Yes. Nampa anticipates the recycled water will enter the aquifer which feeds many of the wells in the area. As the water enters the aquifer, it will be mixed with the existing groundwater. This interaction will be strictly monitored by the Idaho DEQ to ensure the groundwater is safe and that the recycled water will not degrade the groundwater quality.

### **Q Could infiltration have an effect on farming/agriculture activities?**

**A.** There will be no negative effects on farming/agricultural activities. In fact, farming/agricultural activities may benefit from the additional water available due to the aquifer recharge.

### **Q Could infiltration be harmful to livestock and/or wildlife?**

**A.** No. The clean recycled water applied to the infiltration area will not harm livestock or wildlife.

## Infiltration Options

**Q Can I use the recycled water for irrigation?**  
**A.** Using the recycled water for irrigation is not currently planned, but it could be a possibility at some time in the future. The upgrades required at the plant for direct infiltration would treat the water to the required level for residential irrigation. When it becomes economically viable to consider using this water for residential irrigation, the City could consider switching from infiltration to irrigation in the summer months.

**Q What about mosquitoes?**  
**A.** The City will coordinate with the Canyon County Mosquito Abatement District to ensure the City meets all of the requirements for mosquito abatement.

**Q Will it smell bad?**  
**A.** No. The clean recycled water has no odor.

**Q Could it flood?**  
**A.** Yes, but it is highly unlikely. The infiltration basins will be designed to handle a major storm event without flooding. Additionally, measures will be put in place to ensure that excess water is not applied to the infiltration basins that would cause flooding.

**Q How can an infiltration system fail?**  
**A.** Any treatment system is subject to failures. The infiltration option is no different. However, the City is required to work with the Idaho DEQ to ensure that the appropriate redundancies are in place to avoid impacts on the environment and human health. The engineering design documents are required to meet stringent design criteria as delineated by the Idaho DEQ, the Ground Water Quality Rule, the Recycled Water Rules and the Wastewater Rules. The City will be submitting all engineering design documents for a thorough review by the Idaho DEQ. Idaho DEQ will issue a Recycled Water Permit only after they are satisfied that the City's system will meet state requirements.

**Q How would the City address a failure, if it were to occur?**  
**A.** As part of the engineering design process, the City will address various redundancy requirements to ensure failures do not occur. The City will be required to install multiple testing and monitoring steps throughout the system to give immediate indications if there is a problem in the system. The City will then implement previously developed mitigation plans to deal with the situation.

**Q Is infiltration the same as a "sewage lagoon?"**  
**A.** No, this is not a "sewage lagoon." Sewer lagoons are used to treat raw sewage. The water applied to land for infiltration is clean recycled water, in fact the current recycled water is cleaner than the water in Indian Creek today.

## Next Steps

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**Q When will it be determined if infiltration is a real possibility?**  
**A.** It is anticipated that the evaluation of the data gathered will be completed by Spring 2012 and a decision will come shortly thereafter.

**Q Who makes the decision of whether Nampa will implement infiltration?**  
**A.** The City of Nampa is currently working with a citizens advisory group, an industrial advisory group and a professional management team to make recommendations regarding the disposal of Nampa's wastewater. Once a recommendation has been developed based on input from these three groups, City staff will then provide their recommendation to City Council for final review and approval.

**Q How can I find out more information?**  
**A.** To give comments or learn more about upgrading Nampa's wastewater system visit [www.cityofnampa.us/wastewater/](http://www.cityofnampa.us/wastewater/) or contact Karla Nelson at the Nampa Public Works Department, (208) 468-5523, [nelsonk@cityofnampa.us](mailto:nelsonk@cityofnampa.us)