

COUNCIL ACTION FORM

**SUBJECT: SKUNK RIVER PADDLERS' PROPOSAL FOR RIVER VALLEY PARK
LOW-HEAD DAM MODIFICATIONS**

BACKGROUND:

In 1984 the City constructed a low-head dam in River Valley Park. The sole function of the dam is to create a pool of water which serves as a recharge location for the City's water supply aquifer.

On occasion, the dam is also used by citizens for recreational purposes. This includes many individuals on flotation tubes, as well as some organized recreation groups. One such group is the local Skunk River Paddlers. On March 11, 2008, the City Council received a letter from a representative of this group outlining the inherent dangers of low-head dams. In particular, the letter discussed the recirculation effect which occurs immediately downstream of the dam. It also proposed changes to the area which would make it safer for citizens who use it for recreation. While the City has never promoted recreation on the water crossing the dam and has actually posted a sign warning the public to exit the river, it is evident that this water feature continues to attract members of the public who use the area for recreational purposes.

The proposed work consists of placing boulders on the downstream side of the dam. If placed properly, the boulders could minimize the recirculation effect that creates such dangerous conditions. It would also create water "features" which could be used by kayakers.

City staff understands and appreciates the potential safety benefits of this project. Discussions have taken place with the Skunk River Paddlers to consider issues such as liability to the City, on-going maintenance, and potential damage to the existing structure during installation.

The Skunk River Paddlers have received funding for the project through the Iowa Department of Natural Resources. This funding covers material and labor for installation of the boulders. The City's responsibility would be to provide access to the site and to repair any damage to the access road, shoreline, or dam structure that occurs during installation.

An attached supplemental report from staff provides further background on the benefits and potential issues associated with this project.

At this time, staff believes the Council should endorse the concept of the proposed changes to the River Valley Park low-head dam. Staff will then request a construction plan from the group and work with them to ensure that any applicable design standards are followed and that damage to existing City property is kept to a minimum. If repairs ultimately are needed, Water and Pollution Control staff will coordinate those efforts with the Skunk River Paddlers, Public Works, and Parks and Recreation to jointly address any damage.

ALTERNATIVES:

1. Approve the general concept of the proposed modifications to the River Valley Park low-head dam, and direct staff to assist the Skunk River Paddlers in development of a work plan that minimizes damage to the structure and the park.
2. Do not initiate any activity on this project at this time.

MANAGER'S RECOMMENDED ACTION:

Because of the inherent danger of the City's low-head dam in River Valley Park, the Skunk River Paddlers group has proposed modifications to the dam. This project could significantly reduce the downstream recirculation effect while providing recreational benefit to their group. Staff has identified and carefully considered a variety of considerations about the project. The group has received funding for this project from the Iowa Department of Natural Resources. The City's responsibility will be to provide access to the site and develop a plan for installation and on-going maintenance. Although the City has never promoted recreation at the dam, staff understands the potential dangers of the activities which are undertaken at that location by both experienced kayakers and inexperienced swimmers on flotation tubes.

Therefore, it is the recommendation of the City Manager that the City Council adopt Alternative No. 1, thereby approving the general concept of the proposed modifications to the River Valley Park low-head dam, and directing staff to assist the Skunk River Paddlers in development of a work plan that minimizes damage to the structure and the park.

It is important again to highlight the importance of protecting the City's interests in maintaining the structural integrity of this dam. The dam plays a critical role in augmenting the City's water supply, and damage could be difficult and expensive to repair. Therefore, an acceptable plan for protecting the dam and other structures must be agreed upon before the installation can proceed.

Supplemental Information from City Staff regarding
Skunk River Paddlers Proposal for
River Valley Park Low-head Dam Modifications
August 12, 2008

City Council received a letter on March 11 from Dr. Piper Wall who is an Ames resident and member of the local Skunk River Paddlers group. Dr. Wall described in detail a proposed project at the low-head dam in River Valley Park. The following pages provide additional insights into the questions, concerns, and benefits City staff has identified for this project.

The River Valley Park low-head dam was constructed in the 1980s to serve one primary function. The dam pools water from the Skunk River into a prime recharge area for the underground aquifer. This helps maintain water levels in the aquifer which the City uses as its water supply source. This dam replaced temporary sand dams constructed in the 1970s for the same purpose.

As shown below, the dam consists of an approximately four-foot high concrete ledge, followed downstream by an open concrete apron with wing walls on each side. City staff installed metal flashboards to increase the height of the concrete ledge, thus creating a larger water pool upstream of the dam. These metal flashboards become damaged over time by debris and ice, and are replaced periodically by the Public Works Department.



Ames low-head dam in River Valley Park during the drought of 2000

Ames residents sometimes use the dam for recreational purposes. During the summer months, kayakers, rafters, and fishermen can be found in the water immediately downstream of the dam. While the City does not advise or promote use of the dam for recreation, it is clear that members of the public are attracted to this water feature.

A hazard commonly associated with low-head dams is uniform water recirculation. This hydraulic feature occurs on the downstream apron at most levels of flow. Without something to break up the uniform hydraulics, a dangerous undertow can be created. Once caught in the uniform flow, it is easy to capsize and become caught in the recirculation. A number of lowans have drowned in this manner, including an Ames resident east of Ada Hayden Heritage Park in 2005. To address these concerns and avoid future incidents, changes in a number of low-head

dams are being made across the state. Just last year, a low-head dam was converted to rapids in Story City.

In September 2007, members of the Skunk River Paddlers group met with staff from the City's Public Works, Parks & Recreation, and Water & Pollution Control Departments to propose a project which, in their opinion, will provide safety and recreational benefit to the area. Their proposal includes the placement of eight large rocks (one ton each) in a V-configuration on the concrete apron. A second set of approximately 42 smaller rocks would also be placed on the concrete apron farther downstream from the larger rocks. These additions serve two main purposes. First, they provide rapids through which the paddlers can navigate. Second, and more importantly, they break up the dangerous recirculation effect that can occur in the spillway.

The local Skunk River Paddlers group recently worked with Nate Hoogeveen of the Iowa Department of Natural Resources (IDNR) to create their proposed design. Project funding is also available through the IDNR. The cost of material and labor would be covered by this grant.

There has been some question on exactly what authority the City has to approve or disapprove this project. The City owns the low-head dam structure. However, the Skunk River is a navigable "water of the state." According to the City Attorney, the State owns the river bed up to the high water mark. Thus, it is not up to the City to authorize the placement of boulders. The Skunk River Paddlers need to be granted authority by a joint IDNR and Corps of Engineers permit to place the boulders. It is within the City's purview to decide whether or not to grant access via the City's park land to whoever has authority to place the boulders.

City staff discussed this proposed project both internally and, as mentioned previously, with the Skunk River Paddlers. In these discussions, three main issues have arisen; namely, liability, damage during installation, and on-going maintenance.

Liability. As mentioned, the City does not promote recreation at the low-head dam site. A sign is suspended upstream of the dam to notify boaters that they are approaching the dam (see photo below.) In addition, fencing was installed on the south side of the dam adjacent to the parking lot.



The question was raised whether the City will assume additional liability for recreational uses if the proposed safety and recreational improvements move forward. Without question, the public safety and well being in this area is of paramount concern. City staff would like documentation from the Skunk River Paddlers that the IDNR design was created according to any applicable design standards for projects of this type. The City's insurance carrier was briefed on the

project and concurred that compliance with applicable design standards is very important. City staff members do not have the expertise in this area to formally approve a feature designed to prevent water recirculation.

Damage During Installation. Another issue raised is potential damage to existing structures and the park itself during installation of the rocks. It is unclear exactly how the rocks will be installed, but it is evident that heavy machinery will be required. Depending on the time of year, the three-inch thick asphalt park road leading to the dam may not be sufficient to withstand some construction and delivery vehicles. Depending on the method of installation, repair of the road may be necessary. This would not likely be covered under the grant.

The shoreline immediately near the dam is covered with concrete block slope protection. Considerations must be made to ensure that the slope is protected and any grass that is displaced is repaired. In the March 2008 letter to City Council, IDNR's Nate Hoogeveen acknowledged that damage to grass at the top of the sidewall is unavoidable. He also stated it was their hope that City staff would replant and nurture the grass.

There should also be considerations made for protecting the dam structure itself. As proposed, the existing concrete apron will have to support the large rocks. The concrete may be able to support these point loads; however, the installation process is critical to protecting the structural integrity of the apron. Repair of the concrete at any time of year would present challenges, and costs could be significant. While both the Paddlers and IDNR apparently do not have funding for such repairs, it is hoped that peoplepower from the Paddlers supplemented with modest funding from City departments would be adequate to repair any damage incurred during installation.

On-going Maintenance. Another issue discussed by City staff is on-going maintenance of the area. As stated earlier, Public Works maintains the metal flashboards. When needed, they also remove floating debris that becomes trapped on the flashboards. With boulders just downstream, it is likely that debris such as trees will collect in the four-foot-high boulders when they clear the flashboards. In their letter to Council, the Skunk River Paddlers state they would contribute to tree removal once a year with City assistance. It is also conceivable that during extremely high-flow events, some of the smaller rocks could be moved or swept downstream.

In conclusion, while the City does not advise or promote use of the dam for recreational purposes, it is indeed being used at times by kayakers, boaters, and other water enthusiasts for recreation. Therefore, staff sees merit in the Skunk River Paddlers' proposed plans, which should lead to an overall improvement in safety. At the same time, however, staff does not feel comfortable promoting use of the area for anything other than its original intended purpose. If this project moves forward, staff will explore adding more signage to educate citizens of the inherent dangers these dams present.