

**CITY OF BOULDER
WATER RESOURCES ADVISORY BOARD
AGENDA ITEM**

MEETING DATE: February 27, 2006

AGENDA TITLE: Update on Carter Lake Pipeline Feasibility Study

PRESENTER: Carol Ellinghouse, Water Resources Coordinator

EXECUTIVE SUMMARY:

The city of Boulder has participated with other area water providers in a feasibility study of a potential pipeline to carry water from Carter Lake to Boulder Reservoir. This memo provides WRAB with information developed through the feasibility study on potential alignments of a Carter Lake Pipeline, its estimated cost and possible timeline. The process by which the city will evaluate the costs and benefits to Boulder of participating in the construction of the pipeline as compared to other options for addressing issues at the Boulder Reservoir Water Treatment Plant (BRWTP) is also described.

The proposed Carter Lake Pipeline, known as the Southern Water Supply Project II (SWSP II), is a collaborative project between the Northern Colorado Water Conservancy District (NCWCD) and five northeastern Colorado municipal water providers, including Boulder. The proposed pipeline would carry Colorado-Big Thompson Project and Windy Gap Project water from Carter Lake to project participants. The pipeline route is likely to follow portions of the same alignment used by a previous pipeline project (SWSP I) that was completed in 1997 to carry Carter Lake water to the cities of Broomfield, Louisville, Longmont, Superior and eight other municipal water providers.

This memo is an information item only. No action is requested of WRAB at this time and staff is making no recommendation at this time. A Community and Environmental Assessment Process (CEAP) evaluation of options for meeting water supply needs at BRWTP will be completed and brought to WRAB for comment in the future.

Fiscal Impacts:

Budgetary: No additional funding is required in addition to current budget resources at this time. Work to date on the pipeline feasibility study and evaluation of permitting requirements has been paid from existing budgets and has totaled \$211,685. Should it be decided to proceed with the construction of a Carter Lake pipeline as a SWSP II participant, funds will need to be allocated within the Water Utility Capital Improvement Project budget. The cost for Boulder's share of pipeline design and construction costs is estimated to be \$20,148,000.

Staff Time: All activities at this time are a part of the normal work plan for staff. Gathering further information and preparing a CEAP may require use of a consultant at an estimated cost of \$8,000, to be paid out of existing budgets.

Other Impacts: None at this time.

Environmental: Should the SWSP II project proceed, there will be temporary construction impacts within the selected pipeline corridor.

Economic: The Carter Lake pipeline would allow the BRWTP to treat higher quality water directly from Carter Lake, instead of the highly mineralized supply in Boulder Reservoir or the microbial-laden water from the Boulder Feeder Canal. This may reduce costs for industries that require very pure water supplies and/or have on-site treatment facilities.

Community: If the portion of Boulder's CBT and Windy Gap water that is delivered for direct treatment at BRWTP is delivered in a Carter Lake pipeline, the flows in the Boulder Feeder Canal will be reduced to just the portion of Boulder's water that will be exchanged to upper Boulder Creek reservoirs and the water used by other CBT allottees. Some members of the community have expressed concerns about aesthetics if the canal flows are reduced.

Recreational: The availability of a Carter Lake pipeline could allow for a reduction in the mitigations necessary for water quality protection that are to be included in the proposed Boulder Feeder Canal trail management. This could make trail management enforcement less stringent and reduce mitigation costs.

Other Board and Commission feedback: None at this time.

Public feedback: None at this time. Public input will be sought during a CEAP process evaluating BRWTP options as well as through a 1041 permit process with Boulder County and a Location and Extent review with Larimer County.

Staff recommendation: There is no recommendation at this time.

Analysis:

Boulder Reservoir studies

A Community and Environmental Assessment Process (CEAP) study will be completed that incorporates information that has been developed in the Carter Lake pipeline feasibility study, the Boulder Reservoir Source Water Quality Planning Study, and other studies of water supply and facilities for the BRWTP. The CEAP will evaluate options for addressing water supply and treatment needs at the BRWTP that include construction of the Carter Lake Pipeline, construction of a new terminal reservoir or water treatment plant improvements. Staff anticipates presenting the CEAP to WRAB for comment in early 2007.

Boulder's participation in the feasibility study for the Carter Lake pipeline resulted from recommendations developed through four separate studies of the BRWTP water supplies and facilities. These studies were the Treated Water Master Plan (2000), Assessment of the BRWTP (2001), Source Water Quality Planning Study—Phase I (2003) and the BRWTP Facility Plan (2003). Information on these studies was presented to the WRAB on October

17, 2005. The city has recently issued a Request for Proposals for the Source Water Planning Study—Phase II in which improvements to the treatment process will be evaluated in conjunction with source water protection options. This approach will identify the most cost effective means of meeting regulatory requirements and achieving the city’s water quality goals prior to large investments in either treatment facilities or the Carter Lake pipeline. In order to accurately perform this evaluation, it was necessary to have the detailed cost information on the Carter Lake pipeline that was developed through the feasibility study. The Source Water Planning Study—Phase II is expected to be completed in late 2006 and will provide important information for the CEAP.

The United States Environmental Protection Agency (EPA), through the Safe Drinking Water Act, has focused special attention on reducing the presence of microbial pathogens, most importantly Cryptosporidium, because they are resistant to traditional disinfection methods. The EPA has proposed a new regulation called the Long-term 2 Enhanced Surface Water Treatment Rule (LT2ESWTR). This regulation would require some public water systems to provide additional treatment for Cryptosporidium by implementing one or more source water protection or treatment options. An important aspect of the proposed LT2ESWTR is promoting a multi-barrier approach for treating drinking water. A multi-barrier treatment process provides a number of protective “layers” against contamination by using more than one method of prevention and treatment to remove/inactivate pathogens and minimize disinfection byproducts (DBPs).

The proposed LT2ESWTR requirements for Cryptosporidium for a particular water system are based on the vulnerability of its source water to contamination and are made on a system-specific basis. The regulations specify categories (bins) based on the quality of the source water and corresponding additional source water protection or treatment from a “toolbox” of options. A water supply can experience additional contamination up to a specified threshold before it is reclassified into another bin.

Based on current water quality data, water taken directly from the Boulder Feeder Canal into the BRWTP exceeds a threshold level for Cryptosporidium. Therefore, additional source water protection or treatment will be required once the LT2ESWTR regulation is enacted. It is unknown how much future water quality in the Boulder Feeder Canal will degrade due to land use changes or what future treatment standards will be, so pursuing source water protection options could give some protection against the need to add expensive treatment processes in the future such as UV, ozone or membranes.

Long-term improvements at the BRWTP are not firmly established at this time. The final combination of long-term improvements will be determined by future regulatory requirements for Cryptosporidium removal/inactivation, the city’s internal goals and the feasibility of source water protection improvements.

Carter Lake Pipeline Feasibility Study

Integra Engineering performed the feasibility study of the Carter Lake pipeline for SWSP II project participants. A Final Report was issued on January 6, 2006. (A copy of the report may be reviewed by contacting Carol Ellinghouse at 303-441-3118.) Information on participants in the Carter Lake feasibility study is summarized in the table below. The Town of Erie was initially a project participant but has elected not to continue.

<i>Participant</i>	<i>Pipeline Capacity (cfs)</i>	<i>Delivery Pt. Elevation (ft MSL)</i>	<i>Cost</i>
City of Boulder	25	5200	\$ 20,148,000
Left Hand Water District	11	5130	\$ 7,641,000
Little Thompson Water District	3	5400	\$ 856,000
Central Weld Water District	10	5400	\$ 2,853,000
Town of Frederick	6	5400	\$ 1,712,000
Total	55		\$ 33,210,000

The feasibility study evaluated pipeline hydraulic criteria, feasible alignments, and projected costs. The consultant obtained information from GIS databases, aerial photography, geologic data, property information, existing utility mapping, original SWSP project data and environmental/cultural studies. Several pipeline alignments were evaluated based on adjacent land use, existing easements, proximity to residential structures, avoidance of open space areas, stream crossings, floodplains, storm drainage, groundwater, visual resources, natural landmarks, difficult restoration areas, transportation impacts, biological resources, wetlands, rare plant communities, critical wildlife habitat, cultural resources, extreme slopes, underground mines, permitting requirements, and cost.

The proposed pipeline would connect to the existing St.Vrain Supply Canal diversion structure just below the Carter Lake dam. The pipeline will likely be constructed with steel pipe that is tape-coated and cement mortar-lined, although ductile iron pipe was also evaluated. If steel pipe is selected, the pipeline diameter would range from 28 inches to 42 inches, and steel thickness would be from 0.145 to 0.22 inches. If the project proceeds, construction might begin in mid-2008, and the pipeline might be operational in mid-2010.

Several preliminary pipeline alignments were evaluated based on initial screening criteria to arrive at four alternatives. System hydraulics for each alternative was studied in greater detail. Each alternative was then reevaluated to select a preferred alternative. Two of the alternatives have no high impact areas and will result in lower impacts to residential properties, riparian habitats, trees, and transportation than the other alternatives. One of these two alternatives is less expensive and was selected as the preferred alternative

The preferred alternative for the pipeline alignment parallels the existing Carter Lake pipeline for much of its length. The existing easement for the original pipeline is 80 to 90 feet in width, so no new easements would need to be acquired to place a second Carter Lake pipeline in these locations. Construction widths may be narrowed for short distances to reduce impacts to environmentally sensitive areas. New easements would be acquired in areas where the second pipeline does not parallel the first pipeline.

Attachments:

Attachment A – Map of the Preferred Pipeline Alignment

Attachment B – Cost Estimates for Preferred Alignment

Attachment C – Proposed Project Schedule