

RECLAMATION

Managing Water in the West

EA NO. EC-1300-06-03

Town of Berthoud Long-term Water Related Contract

Final Environmental Assessment



**U.S. Department of the Interior
Bureau of Reclamation
Eastern Colorado Area Office
Loveland, Colorado**

March, 2006

CHAPTER ONE

Purpose and Need

The U. S. Bureau of Reclamation (Reclamation) proposes to execute a long-term water related contract with the Town of Berthoud (Berthoud). Berthoud is seeking a more reliable water conveyance system for the portion of its municipal water supply associated with its Big Thompson River (Big Thompson) water rights. Historically, Berthoud has used the Handy Ditch, which diverts water from the Big Thompson River at the Little Dam (see Location Map), to convey its Big Thompson water rights, but operation of the ditch has become increasingly less reliable in drought years.

In the past Reclamation has contracted with Berthoud for the temporary exchange and conveyance of non-project water through the facilities of the Colorado-Big Thompson (CBT) Project. Compliance with the National Environmental Policy Act (NEPA) for the temporary excess capacity contracts has been completed on an annual basis with a Categorical Exclusion Checklist. Currently, Berthoud has requested an additional temporary excess capacity contract for the current water year (May-October) while the negotiations for the long-term excess capacity contract are finalized. This Environmental Assessment (EA) will also serve as the NEPA compliance for Berthoud's requested long-term excess capacity contract and the requested 2006 temporary excess capacity contract.

This EA, prepared in compliance with the NEPA, could lead to a FONSI (*Finding of No Significant Impacts*) if environmental effects of the proposed action are found to be insignificant, or to an EIS (*environmental impact statement*) if effects are found to be significant. In the chapters to follow, background on the matter is provided (Chapter 1), alternative plans outlined (Chapter 2), affected environment discussed (Chapter 3) and effects of the alternatives analyzed (Chapter 3). The EA concludes with a brief description of the consultation and coordination done during the study (Chapter 4).

PURPOSE & NEED

Berthoud needs a dependable conveyance system that provides for full delivery of its Big Thompson municipal and industrial (M&I) water supply to meet its current and future water demands. The current method of conveyance, use of an irrigation ditch, is subject to limited operation in drought years and due to other circumstances which can limit the amount of water Berthoud is able to convey to its storage facility.

BACKGROUND

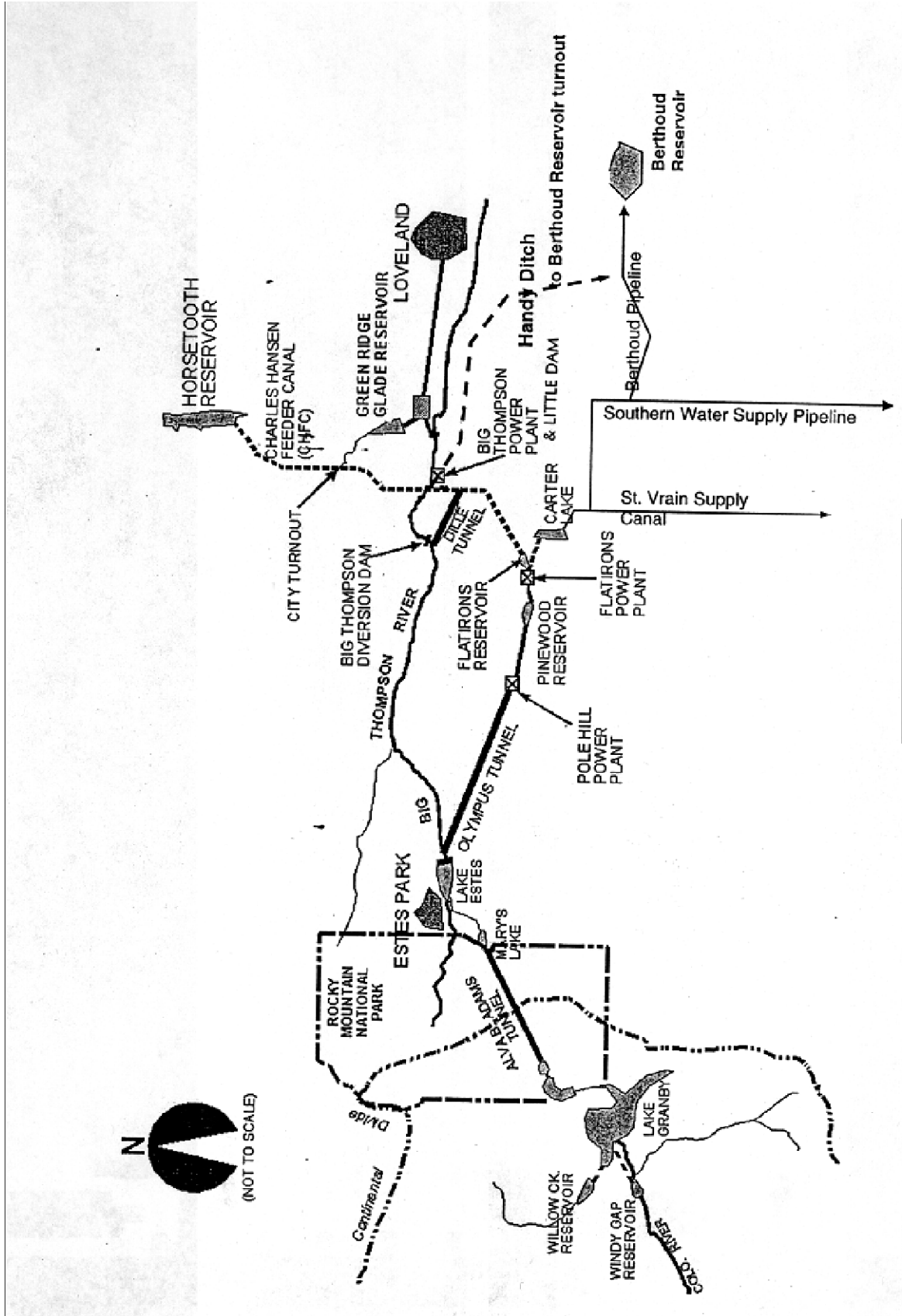
Berthoud has the two most senior water rights on the Big Thompson and relies on these as a primary source of water for its citizens. Berthoud has a long-standing agreement with the Handy Ditch Company to convey Berthoud's water through the Handy Ditch. Historically, Big Thompson water has been diverted at the Little Dam into Handy Ditch and delivered for storage to Berthoud Reservoir (see Location Map). The ditch has typically been operated for 159 days during the irrigation season. In 2003 and 2004, the Handy Ditch operated for 96 and 155 days, respectively. There is uncertainty each year as to how many days the ditch will operate due to drought or other circumstances beyond Berthoud's control. Reclamation entered into three separate one-year contracts with Berthoud in the past three years (2003, 2004, and 2005) to convey its Big Thompson water through Colorado-Big Thompson Project (CBT) facilities to Berthoud Reservoir.

The CBT was designed to deliver an average of 310,000 acre-feet of water from the west slope to the east slope of the Rocky Mountains. However, the average historic yield has only been about 225,000 acre-feet annually, leaving considerable unused or "excess" capacity within the system.

In the 1990's, the Southern Water Supply Project Pipeline (SWSP) was constructed by the Northern Colorado Water Conservancy District (District) to deliver CBT water to various municipalities in the southern part of the District, including Berthoud. This conveyance system is used to deliver the CBT units (i.e. shares of water) that Berthoud owns, which are also a primary source of water for the town. As a part of its water supply planning, in 1993 Berthoud obtained a decree in Case No. 84CW421 in District Court, Water Division 1, Colorado to use CBT facilities as an alternate point of diversion for its Big Thompson water rights.

In anticipation of a conveyance contract with Reclamation to take delivery of water from CBT facilities Berthoud constructed a pipeline from the District's SWSP to their existing diversion point on the Handy Ditch. This pipeline was partially constructed in 1998 with the remainder constructed in 2002-2003. Approximately 40 percent of the pipeline is buried underneath County Road 8 and the remainder crosses historical winter wheat fields which are being developed into rural housing.

Because the CBT, SWSP, and Berthoud Reservoir are all existing facilities, no new construction would be necessary for conveyance of Berthoud's Big Thompson water through CBT facilities.



Location Map

ISSUES

The following issues regarding the proposed action have been identified through scoping.

- Effects on the hydrology and biology of the Big Thompson and downstream water courses;
- Impacts on Federally-listed threatened and endangered species;
- Impacts on cultural resources.

These issues are addressed either through alternative development found in Chapter 2 or the environmental consequences section of Chapter 3.

CHAPTER TWO

Alternatives

Chapter 2 presents the two alternative plans analyzed in this EA: the *Contract Alternative*—in which a long-term water related contract for use of excess capacity would be executed between Reclamation and Berthoud—and the *No Action Alternative*—in which no contract would be implemented for conveyance of Berthoud’s Big Thompson water in CBT facilities.

CONTRACT ALTERNATIVE (PREFERRED ALTERNATIVE)

Reclamation would execute a 40-year water related contract with Berthoud for the use of CBT excess capacity to deliver Berthoud’s Big Thompson water. Berthoud’s water would be diverted into CBT facilities at the Lake Estes outlet works or through the Dille Tunnel. In exchange, a like amount of CBT water (less transit losses) would be released from Carter Lake and delivered to Berthoud at the Southern Water Supply Pipeline turnout on the St. Vrain Supply Canal.

The contract would only permit Berthoud’s Big Thompson water to be delivered when there is excess capacity in CBT facilities, or in other words only when the conveyance of CBT water is not occupying the entire capacity of the facilities and there is unused space available for Berthoud’s Big Thompson water to be delivered.

NO ACTION ALTERNATIVE

In this alternative, Berthoud would continue to use the Handy Ditch for conveyance of its Big Thompson water. Delivery of its water will be dependent on operation of the ditch, and at times when operation of the ditch is limited, delivery of Berthoud’s Big Thompson water to Berthoud Reservoir may be limited.

CHAPTER THREE

Affected Environment and Environmental Consequences

Chapter 3 describes hydrology and cultural resources with the potential to be significantly affected by the proposed action. This description is followed by an analysis of the effects of the alternatives (presented in Chapter 2). Effects of the No Action Alternative are presented first, followed by effects of the Contract Alternative.

Scoping determined that Indian trust assets (legal interests in property and rights held in trust by the U.S. for Indian tribes or individuals), environmental justice (adverse effects to a particular social-economic group, including low-income or minority populations), aquatic resources, prime farmlands, recreation, hydropower production, and floodplains would not be affected by either of the alternatives in this EA. In addition, no reasonably foreseeable activities were identified that when combined with either the No Action or Contract alternative would have potentially significant cumulative effects. Historic and current cumulative impacts are reflected in the existing conditions of the resources.

Endangered Species Act (ESA) consultation was completed in response to Berthoud's request for *temporary* (1-year) excess capacity contracts (which were issued in 2003, 2004 and 2005). Consultation with the Service included a biological evaluation (BE) prepared by Reclamation (12/23/2003), biological opinion (BO) prepared by the Service (4/9/2004), and Reclamation acceptance of the BO (4/29/2004). The BO included a Reasonable and Prudent Alternative (RPA) to minimize impacts to certain Platte River species. Under the RPA, Berthoud makes annual payments to a fund used to restore or improve habitat in the Platte River for endangered species until such time that the Platte River Recovery Program is established and Berthoud begins participation in that program. The BE and BO are hereby incorporated by reference to this document. Reclamation and the Service determined in August 2005 that the BE and BO for the temporary contracts had direct application to the long-term contract and amended the BO to include this action. No additional analysis of ESA-listed species is provided in this chapter.

HYDROLOGY

Affected Environment

Big Thompson River. Berthoud's current Big Thompson water rights allow diversion of water for 159 days per year between April 27 and October 31 at the Handy Ditch diversion near Little Dam on the Big Thompson. The first water right is decreed for 4.14 cfs with an adjudication date of May 28, 1883 and is one of the most senior water rights on the Big Thompson. Berthoud also owns a second Big Thompson water right for 3.0 cfs, with a more junior priority (Adjudication date of June 29, 1916).

Flow in the Big Thompson between Estes Park and Little Dam is largely regulated by discharges from Lake Estes. The river runs through a relatively steep-sided canyon between these points and is basically only supplemented by minor perennial streams and the slightly more substantial North Fork of the Big Thompson River. The average historic monthly flow in the Big Thompson at the gage below Lake Estes for the months when Berthoud is decreed to divert is shown in Table 1.

Table 1. Average Daily, Daily Minimum, and Daily Maximum Flow for the Period of Record (January, 1991-February, 2005) at the Big Thompson River Gage Below Estes Lake (BTBLESCO) From April to October In CFS. (Reclamation HYDROMET, 2005)

Month	April	May	June	July	August	September	October
Average Daily	46.29	164.94	260.69	226.71	124.07	92.27	71.93
Daily Min. /Max.	31.16/ 111.71	80.66/ 466.17	122.35/ 596.06	96.27/ 492.96	59.10/ 231.16	51.04/ 223.65	23.56/ 145.19

Typically during the spring/early summer run-off period Reclamation diverts some of the water that is in excess of the minimum releases from Lake Estes through CBT powerplant facilities to generate power, commonly referred to as skimming. Water skimmed for this purpose is then returned to the Big Thompson at Reclamation’s Big Thompson Powerplant and/or wasteway (See Location Map). Water used for skim operations is composed of water used by entities downstream of the Big Thompson Powerplant and/or wasteway, such as Berthoud and Handy Ditch’s water.

Three minimum instream water rights are held by the Colorado Water Conservation Board (CWCB) for segments of the Big Thompson between Lake Estes and Little Dam (Table 2). The CWCB’s water rights are for minimum flows necessary to maintain viability of the aquatic community of a river or stream.

Table 2. Minimum Instream Flows in CFS for the Big Thompson River Between Lake Estes and Little Dam established by the Colorado Water Conservation Board.

River Segment	May 1-October 31	November 1 – April 30
Confluence of Dry Gulch to the Confluence with the North Fork of the Big Thompson River	40	15
Confluence with the North Fork of the Big Thompson River to the Idylwild Pipeline Diversion	50	20
Loveland Powerplant Outfall to the Dille Tunnel Diversion	50	20

Reclamation’s Standing Operating Procedures for the CBT require minimum releases (SOP minimum release) from Lake Estes of either those flows outlined in Table 3 or daily inflow, whichever is less. Water in excess of the minimum releases is often diverted at Lake Estes through CBT facilities to generate power and then returned to the Big Thompson through the wasteway near the Little Dam, upstream of the Handy Ditch or through the Big Thompson Powerplant downstream of Handy Ditch. This process is commonly referred to as “skimming”.

Skimming typically occurs in the spring and early summer when inflows to Lake Estes are sufficient to maintain the minimum releases and allow for skimming.

Table 3. Reclamation Standing Operating Procedures Minimum CFS Releases From Lake Estes by Date.

4/16-4/30	5/1-5/15	5/16-8/15	8/16-8/31	9/1-9/15	9/16-10/31
50	100	125	100	75	50

Return flows from Berthoud’s municipal and industrial use, as well as return flows from Handy Ditch and the associated agricultural lands, are attributed to the Little Thompson River and to the Home Supply Canal. Division 1 of the Office of the State Engineer Division of Water Resources has quantified the return flows associated with Berthoud’s use of its Big Thompson water rights as shown in Table 4.

Table 4. Return Flows Associated with Berthoud’s Use of Its Big Thompson Water Rights.

Month	May	June	July	August	September	October
AF/Month	4	5	6	6	5	4
CFS (AF Spread Over 30 Days)	.067	.083	.1	.1	.083	.067

Handy Ditch. Handy Ditch operation can vary significantly from year to year. In wet, average and most drought years, the ditch is operated long enough for Berthoud to divert for its full 159 days. In severe drought years, the ditch may potentially be operated less than Berthoud’s 159-day season. Operation of the ditch is limited when water diversion for the junior water rights of Handy Ditch users is prevented by more senior water rights uses due to reduced flow in the Big Thompson.

Berthoud’s 1989 agreement with the Handy Ditch Company for conveyance of Berthoud’s water dedicates 22.5% (approx. 1.6 cfs) of Berthoud’s Big Thompson water right to the ditch company as compensation for use of the ditch. Per the agreement, this water would still go to the Handy Ditch Company in the event that Berthoud chooses to use an alternative point of diversion and conveyance with the following exceptions: 1) As agricultural lands served by the Handy Ditch are developed, the 22.5% portion of water is reduced by an amount equivalent to the portion of water used on those lands, and 2) If at any time the Handy Ditch does not operate, Berthoud may divert the 22.5% for its use.

No Action Alternative

Berthoud would continue to convey its water using the Handy Ditch. Big Thompson flows, as well as, Berthoud’s diversion rates and timing, and return flows would be similar to historic practices. Over time, the percentage of Berthoud water used for M&I and agricultural purposes is expected to gradually change. As Handy Ditch agricultural use decreases, the amount of water that Berthoud dedicates to the Handy Ditch (originally set at 22.5%) will decrease a proportionate amount and will be converted to M&I uses for Berthoud.

At times when Handy Ditch operation is limited such as in a drought year, Berthoud is expected to experience minor to potentially substantial water shortages depending on how limited operation of the ditch is in a given year. Berthoud has other sources of water to meet its municipal demands, but they are insufficient to supply all of its current and future demands. Berthoud's Big Thompson water that is not diverted will remain in the river and be available for other decreed uses on the Big Thompson. Net increases in the river are not expected as a result of Berthoud's inability to divert. Because reduced Handy Ditch operations are expected to occur during droughts when junior water users are likely to be unable to divert all of its decreed water, Berthoud water left in the river would most likely be used to meet these other decreed uses.

Berthoud's continued use of the Handy Ditch would not have an impact on the minimum instream flows established for the Big Thompson River between Lake Estes and the Handy Ditch diversion. Berthoud's water would continue to flow through the portions of the river that have minimum instream flow decrees.

Contract Alternative

Contracting to deliver Berthoud's water in CBT facilities will not result in a reduction in flows in the Big Thompson, because it is not expected to result in a change in releases from Lake Estes. Reclamation's operations, including such activities as the minimum required Lake Estes releases and skimming, regulate the majority of flow in the Big Thompson. As a result, Berthoud's water has been diverted through CBT facilities as a part of skimming and/or used to meet minimum releases at Lake Estes for many years as a part of CBT operations. Consequently, the proposed contract is not expected to result in any change in Big Thompson flows between Lake Estes and Little Dam.

Although streamflows would not change, water accounting would reflect that approximately 5.43-5.46 cfs of Berthoud's decreed water would be diverted into CBT facilities at Lake Estes or Dille Tunnel for Berthoud's use. These diversions would occur between April 27 and October 31. The 5.43-5.46 cfs quantity represents Berthoud's decreed rights to 7.14 cfs minus quantities to meet the 22.5% to Handy Ditch and a varying amount for maintenance of historic return flows (see Table 4).

At times when the Handy Ditch does not operate, Berthoud's decreed 7.14 cfs Big Thompson water rights, minus historic return flows, would be diverted at the CBT points of diversion. This is most likely to occur in severe drought years, when ditch operations are likely to be less than the typical 159-day season of operation. Consequently, in those years approx. 7 cfs would be diverted at either Lake Estes or Dille Tunnel for a portion of Berthoud's 159 day diversion period. As an example, in 2003 Handy Ditch was operated for approximately 96 days, which would have meant Berthoud could divert approximately 7 cfs to CBT facilities for 63 days that year. Limited operation of the Handy Ditch would no longer result in Berthoud's decreed Big Thompson water remaining in the river to be used by junior water rights holders.

Berthoud's water dedicated to Handy Ditch (22.5% of its 7.14 cfs decree or approximately 1.61 cfs) would continue to be diverted at the Little Dam when the ditch is operated. Over time, this amount is expected to gradually decrease as agricultural water use along Handy Ditch is converted to M&I uses. When this occurs, a proportionate share of the 22.5% dedicated to Handy Ditch would divert back to Berthoud's M&I use and could be diverted into CBT facilities. Again, this would not result in actual increases in diversions at either Lake Estes or Dille Tunnel, but would reflect changes in water accounting. This conversion in use is expected to be very gradual and no large conversions in use are anticipated (Zilis pers. comm., 2005).

Berthoud's water rights for diversion of Big Thompson water into CBT facilities require that the historic return flows to the Big Thompson from M&I and agricultural uses be maintained as though the M&I portion of its water was still diverted at Handy Ditch. Table 4 displays the historic return flows for the subject water by month – water that cannot be diverted by Berthoud when its water is diverted through CBT facilities. This water would be left in the river, but could be used by other water users with decreed water rights.

CBT minimum releases from Lake Estes would not be impacted by the proposed action, because by contractual agreement CBT operations take precedent over excess capacity activities such as this proposed action when conflicts in operations arise. However, little or no conflict is anticipated because as mentioned previously Berthoud's water has been intermingled in CBT operations for many years. The proposed action would only affect the SOP minimum releases from Lake Estes when inflows to Lake Estes are less than flows outlined in Table 3. For example if inflows to Lake Estes are 39 cfs, and Berthoud's 7 cfs was diverted at Lake Estes, Reclamation would only release 32 cfs downstream. In order to avoid this potentially adverse impact, at those times when inflows to Lake Estes are less than the downstream CWCB instream flow water right of 40 cfs, Berthoud's non-project water will be delivered to the Dille diversion and a like amount of C-BT water would be released at Carter Lake and delivered to Berthoud.

Therefore, no impacts to CWCB's instream flow water rights would occur as a result of the proposed action because the minimum releases from Lake Estes would always meet or exceed CWCB's minimum instream flows and the proposed action would not alter the pattern of releases.

As diversions of Berthoud's water are made into CBT facilities, releases will essentially be made simultaneously from Carter Lake to the St. Vrain Canal for Berthoud's use. The contract will not result in long-term storage of Berthoud's water in either Horsetooth Reservoir or Carter Lake. Consequently, the proposed action would not have a substantive effect on water surface elevations at either reservoir.

Although the hydrology analysis focuses on the long-term contract the effects of a temporary excess capacity contract would be similar. Therefore, no further analysis is needed to measure the effects of the temporary excess capacity contract.

CULTURAL RESOURCES

Affected Environment

The National Historic Preservation Act and 36 CFR Part 800 (the federal regulations which implement the Act) require Reclamation to consider effects to cultural resources within the Area of Potential Effects (APE). The APE is defined as “the geographic area or areas within which an undertaking may directly or indirectly cause changes in the character or use of historic properties, if any such properties exist”. The APE for this undertaking includes the Big Thompson from Lake Estes to the Handy Ditch diversion at Little Dam, the Handy Ditch from its headgate to the turnout at Berthoud Reservoir, CBT facilities including Pinewood Reservoir, Flatiron Reservoir, Carter Lake, Horsetooth Reservoir, the Dille Tunnel, the conveyance features that connect these CBT facilities, the St. Vrain Supply Canal from Carter Lake to the Southern Water Supply Project Pipeline, and the Southern Water Supply Project Pipeline from the St. Vrain Supply Canal turnout to Berthoud.

No Action Alternative

There would be no undertaking and no effects to cultural resources under this alternative.

Contract Alternative

Both the proposed temporary and long-term contracts would result in essentially no change in flows and storage levels in the Big Thompson and within CBT facilities. Storage and conveyance within CBT facilities would be within current capacity of the features and not result in additional inundation of lands at reservoirs. No construction activities are proposed in association with the either contract. Given this information, the proposed action has no potential to cause effects to cultural resources.

CHAPTER FOUR

Consultation and Coordination

SCOPING

The following issues related to the proposed action were identified by Reclamation resource specialists.

- Effects on the hydrology and biology of the Big Thompson and downstream water courses;
- Impacts on Federally-listed threatened and endangered species;
- Impacts on cultural resources.

These issues are addressed either in the alternatives section of Chapter 2 or the environmental consequences section of Chapter 3.

KEY CONTACTS AND CONSULTATIONS

In additions to those who provided comments, the following were consulted about providing information for the EA. They are:

Paul J. Zilis, Vranesh and Raisch, LLP, who provided information on the Berthoud's water rights, water operations, and use of the Handy Ditch.

Sandy VanDeMiller, U.S. Fish and Wildlife Service, who provided information on species within the action area and the consultation process for the proposed action.

Ron Thomasson, Bureau of Reclamation, who provided information about CBT operations and potential hydrologic effects of the proposed action.

Malcolm Wilson, Bureau of Reclamation, who provided information about CBT operations and potential hydrologic effects of the proposed action.

Terry Gomoll, Bureau of Reclamation, who provided information about the proposed action and water related contracting.