Feasibility Study
for
Left Hand Water District's Participation in

Northern Colorado Water Conservancy District
Southern Water Supply Project II

Prepared by

Left Hand Water District
PO Box 210
Niwot, CO 80544-0210

for

The Colorado Water Conservation Board

FEASIBILITY STUDY APPROVAL
Pursuant to Colorado Revised Statutes 37-60-121 &122, and in accordance with policies adopted by the Board, the CWCB staff has determined this Feasibility Study meets all applicable requirements for approval.

Signed 9/8/2017 Date

August, 2017

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The Colorado Water
Conservation Board

August, 2017

COLORADO
Colorado Water Conservation Board
Department of Natural Resources

Water Project Loan Program

Application Type

☐ Prequalification *(Attach 3 years of financial statements)* ☑ Loan Approval *(Attach Loan Feasibility Study)*

Agency/Company Information

Company / Borrower Name: Left Hand Water District

Authorized Agent &Title: Christopher Smith, P.E., General Manager

Address: PO Box 210, Niwot, CO 80544-0210

Phone: (303) 530-4200 | Email: chrissmith@lefthandwater.org

Organization Type: ☐ Ditch Co, ☑ District, ☐ Municipality ☐ other: _____ | Incorporated? ☑ YES ☐ NO

County: Boulder, Weld, Broomfield | Number of Shares/Taps: 7,154

Water District: 5 | Avg. Water Diverted/Yr 4,400 acre-feet

Number of Shareholders/Customers Served: 20,000 | Current Assessment per Share $_____ (Ditch Co)

Federal ID Number: 84-1143030 | Average monthly water bill $ 98.73 (Municipality)

Contact Information

Project Representative: Christopher Smith, P.E., General Manager

Phone: (303) 530-4200 | Email: chrissmith@lefthandwater.org

Engineer: Joel Spencer

Phone: (303) 951-0621 | Email: jtspencer@dewberry.com

Attorney: Scott Holwick

Phone: (303) 776-9900 | Email: sholwick@lyonsgaddis.com

Project Information

Project Name: Southern Water Supply Project II (SWSPII)

Brief Description of Project: (Attach separate sheets if needed)

The purpose of this application is to fund the District's portion of the construction costs for the Southern Water Supply Project II (SWSPII). The project, proposed by the Northern Colorado Water Conservancy District (Northern Water), is a raw water pipeline beginning at Carter Lake and terminating at the City of Boulder's Boulder Reservoir Treatment Plant. The pipeline will deliver raw water for municipal use to and is funded by the Project participants (Left Hand Water District, Longs Peak Water District, City of Boulder).

General Location: (Attach Map of Area)

20-mile pipeline from Carter Lake south to the City of Boulder's Boulder Reservoir.

Estimated Engineering Costs: | Estimated Construction Costs: 10,735,293

Other Costs (Describe Above): | Estimated Total Project Costs: 10,735,293

Requested Loan Amount: 10,000,000 | Requested Loan Term (10, 20, or 30 years): 20 Years

Project Start Date(s) Design: 2017 (currently at 60%) Construction: APRIL 2018

Signature

7-27-17

General Manager

Signature / Title Date

Return to: Finance Section Attn: Anna Mauss
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Denver, CO 80203
Ph. 303/866.3449
e-mail: anna.mauss@state.co.us

LEFT HAND WATER DISTRICT
FEASIBILITY STUDY

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PURPOSE

The Left Hand Water District (District, LHWD) is participating in the construction of the Southern Water Supply Project II (SWSPII). The purpose of this application is to fund the District's portion of the construction costs. SWSPII, proposed by the Northern Colorado Water Conservancy District (Northern Water) acting by and through the Southern Water Supply Project Water Activity Enterprise (Enterprise), is a raw water transmission pipeline beginning at Carter Lake in Larimer County, extending into Boulder County and terminating at the City of Boulder's Boulder Reservoir Treatment Plant. The pipeline will be used to deliver Colorado-Big Thompson and/or Windy Gap project water to the participants' water treatment plants for municipal use. The Enterprise is entirely funded by the Project participants (Left Hand Water District; Longs Peak Water District; City of Boulder). Participants will share in the pipeline capacity based on pro-rata participation within the identified pipeline segments, all of which will be governed via Allotment Contracts between each participant and Northern Water. The participation levels for the three participants are as follows:

City of Boulder – 32 cfs (~ $32,010,000)
Left Hand Water District – 12 cfs (~ $10,735,000)
Longs Peak Water District – 03 cfs (~ $1,144,000)

The District operates two water treatment plants in Boulder County, CO. The Spurgeon Water Treatment Plant (WTP) receives raw water from shares owned in the Left Hand Ditch Company. Left Hand Ditch share water is delivered to the Spurgeon WTP via the Haldi Pipeline which is connected to two District reservoirs (Joder Reservoir & Margaret Spurgeon Reservoir No. 1) and directly to the Spurgeon WTP. The Dodd WTP receives raw water from Northern Water via the Boulder Feeder Canal (BFC). Since the BFC is operated by Northern Water on a seasonal basis, the Dodd WTP is limited in operation to between April 1st and October 31st of each year. **The construction of this project will allow year-round use of the Dodd WTP, which, in addition to water quality concerns, is the main purpose for participation in this project.**

The northern part of the project, taking place in Larimer County and the northern segment within Boulder County, parallels the existing SWSP alignment within existing easements acquired for the purpose of a second pipeline when originally constructed in the 1990's. The remaining portion from approximately the north side of the City of Longmont to the terminus at Boulder Reservoir will be constructed in easement and rights-of-way acquired specifically for this Project. A Vicinity Map is provided in Appendix A.

PROJECT SPONSOR

The Left Hand Water District is a quasi-municipal special district formed under the provisions of Section 32-1-305(6) of the Colorado Revised Statutes (CRS) in May 1990 to provide potable water service to customers within the District's service area. The District's service area encompasses 108 square miles of territory in Boulder and Weld Counties, CO. The District is generally bounded by the cities of Boulder, Lafayette, and Erie to the south; the City of Longmont to the north; I-25 to the east; and the foothills to the west. Currently, the District serves a population of approximately 20,000 people through 7,154 individually metered taps. The District's customer base consists of 95% single family/multiple housing/master meter residential taps and 5% commercial or landscape only taps. A map of the District Service Area is provided in Appendix B.

Water is treated at two District owned treatment plants. The Spurgeon WTP located at 3500 Nimbus Road Boulder, CO, is a 7.5 million gallon per day (MGD) conventional multi-media water treatment plant and is the only year-round plant capable of serving the entire District. The Dodd WTP, located at the main administrative campus at 6800 Nimbus Road, Longmont, CO, is a 10-MGD pressure membrane micro-filtration treatment plant. The Dodd WTP underwent an extensive upgrade and expansion project in 2015-2016 and is designed to allow for the proposed connection to the SWSPII as well as for expansion to a build-out capacity of 16 MGD. Boulder County 1041 Permit approval received for the upgrade to the Dodd WTP included the construction of the SWSPII connection as well as future capacity increases up to the design capacity of 16 MGD.

Water usage revenue typically accounts for approximately 70% of the District's operating revenues. Other sources of revenue include tap fees (plant investment fee & water dedication/cash-in-lieu payments), annual lease of surplus water, property lease agreements, and interest on investments. The District does not levy taxes against property in the District.

WATER DEMANDS AND WATER RIGHTS

The 5-year (2012-2016) average raw water demand for Left Hand Water District is 4,400 acre feet. The District's portfolio of raw water is sufficient to meet these demands and includes approximately 20% in reserves. District ownership of water rights includes allotment contracts in the Colorado-Big Thompson (CBT) project (7,028 Units) and shares of Left Hand Ditch Company common stock (2,854 shares). Both sources of raw water available to the District are high quality surface water supplies operated by well known and developed organizations (Northern Colorado Water Conservancy District and Left Hand Ditch Company) and produce dependable yields.

Future growth in the District's customer base is anticipated to be served through additional acquisition of CBT and Left Hand Ditch Company in the short term; and our participation in the Northern Integrated Supply Project (NISP) in the long term. Note that this project does not depend on the success of the NISP application, but rather will be utilized to deliver our current CBT water from Carter Lake to the Dodd WTP and to provide year-round use during periods when the Boulder Feeder Canal is offline.

ANALYSIS OF ALTERNATIVES

Starting in 2003, the District began to review potential alternatives to provide year-round CBT to the Dodd WTP in response to the multi-year drought experienced by water providers in the northern Front Range. Numerous alternatives for the delivery of water to the Dodd WTP were explored at that time, including the following three alternatives. For the purpose of this application the three alternatives provided include: Alternative No. 1) No Action Alternative; Alternative No. 2) Purchase/Long term lease of capacity in the existing SWSP; and Alternative No. 3) SWSPII. An assessment of each alternative follows.

Alternative No. 1

One course of action considered was the No Action Alternative. This non-action was determined to not be a viable option for meeting the District's needs in our current or future condition. The Dodd WTP is currently limited in operation during the irrigation season from April 1st through October 31st due to our reliance on the Boulder Feeder Canal for deliveries of CBT water. In addition to being limited to seasonal use, this reliance on the BFC limits the ability of the District to respond to an emergency requiring the shutdown of the Spurgeon WTP during winter months, or as discovered during the September 2013 flood event, the early closure of the Boulder Feeder Canal. During winter months, all system demands are met at the Spurgeon WTP with deliveries from the Left Hand Ditch Company. However, the Left Hand Ditch Company bylaws contain a limitation on the use of Ditch Company water to those lands historically irrigated by the company. In order to provide water for customers outside of the historic boundary of the Left Hand Ditch Company, the District exchanges CBT with the Ditch Company during summer months into storage in ditch company reservoirs for use during the winter months. A 2005 Agreement between Left Hand Water District and Left Hand Ditch Company limits the amount of exchange to 1,000 acre feet annually such that we are quickly reaching the point where there will not be sufficient capacity for future exchange.

Alternative No. 2

A second alternative explored for delivering CBT water to the Dodd WTP year-round was to purchase existing capacity from a current participant in the existing Southern Water Supply Project. Prior to participating in the permitting and design portion of the SWSPII, the District explored the potential for acquiring capacity in the existing SWSP in 2003 during the multi-year drought beginning in 2002. This alternative had some potential for meeting a portion of winter demand by leasing winter capacity from an existing participant in SWSP but would include the construction of approximately 3 miles of pipeline (~ $2.9M) in addition to the purchase of capacity from an existing participant. The District was ultimately unable to acquire permanent year-round capacity and was only able to identify one participant willing to lease excess winter capacity not to exceed 3.0 cfs. Since the purpose and need of this project was to provide year-round deliveries of CBT water to the Dodd WTP at a capacity of 12 cfs this alternative proved inadequate.

Alternative No. 3

The final alternative explored was the District's preferred alternative: participation in SWSPII, a regional cooperative pipeline project that will deliver 12 cfs directly from Carter Lake to the Dodd WTP. This alternative meets all of the project needs for Left Hand Water District, is regional in nature providing cost-sharing in design, construction, easement and ultimately O&M costs by all project participants. Furthermore, that the project will be designed, constructed and operated by Northern Water to deliver our CBT allotment water was determined by the District's Board of Directors to provide the most cost-effective and reliable solution to meet the District's long term needs.

Selected Alternative

As stated above, the District has determined that participation in the Southern Water Supply Project II (SWSPII) provides the best solution to the needs of the District in meeting both current and future deliveries to the Dodd WTP.

The SWSPII consists of a 20.75 mile long welded steel pipeline from Carter Lake in Larimer County terminating at the Boulder Reservoir Water Treatment Plant. The turn-out facility for the Left Hand Water District will be located within an easement that has been granted to Northern Water on the District's property located at 6800 Nimbus Road. Although the pipeline continues on to the City of Boulder's WTP, this turn-out will be the terminus for Left Hand Water District's participation in the Project. Planning and pipeline routing for this project began in 2005 and has progressed through permitting, easement acquisition and project design. Following several years of planning and the development of a number of alternative

routes, Northern Water submitted a 1041 application to Boulder County in 2011. The alternative alignments presented in the 1041 application went through an exhaustive review by Boulder County Land Use and Planning staff as well as a number of public hearings. The Boulder County Commissioners issued a conditional approval on July 12, 2012. For the Larimer County portion of the pipeline, the Project alignment was submitted to the County for Location & Extent in 2009 (EDAW/AECOM, 2009). Approval for the Larimer County portion was granted by the Larimer County Commissioners June 18, 2009. Provided in Appendix C are: an overall map of the Selected Alternative Project; Southern Water Supply Project II Siting Study (AECOM, 2011); Southern Water Supply Project II Boulder County 1041 Application (AECOM, 2011); and Southern Water Supply Project II Larimer County Location & Extent Application (EDAW/AECOM, 2009). Final Design commenced in late 2016 and will be completed in December 2017. The Project is scheduled for bidding in January 2018 and construction will take place between spring of 2018 and summer of 2019. Detailed construction costs and schedule are provided in Appendix D.

Impacts

Impacts from the project were extensively studied in both the Larimer County 2009 Location and Extent Application and the Boulder County 2011 Areas of State Interest (1041) Permit Application. Potential impacts to natural areas include riparian areas and wetlands near creek/ditch crossings; critical wildlife habitat; native and landscape trees; irrigated & non-irrigated agricultural land; and natural areas including public open space and conservation easements. Other social impacts studied as part of the permitting process included the proximity of the alignment to existing homes; impacts to transportation; the avoidance of existing utilities; impacts to public and private infrastructure including irrigation facilities related to irrigated farmland; and the economic impact to rate payers.

The purpose of the permitting studies and various route alternatives studied during the 1041 & Location and Extent permitting was to identify and ensure that avoidance of impacts was maximized during design & construction and that proper mitigation best practices are utilized both during and post construction. Detailed descriptions of potential impacts and mitigation planning are included within the permitting applications and siting studies (Appendix C).

Institutional Considerations

Permits: Larimer County Location & Extent and Boulder County 1041 approvals have been granted for the project in 2009 and 2011, respectively. Boulder County Resolution 2012-70; and Larimer County Resolution approving L&E File 09-Z1735 have been provided in Appendix E. There are a number of additional institutional considerations in completing the SWSPII.

Northern Water, either in-house or through outside consultants, is completing the remaining permitting which includes the following:

- Larimer County/Boulder County/CDOT right-of-way permits;
- City of Longmont Planning Development Permit;
- BNSF railroad crossing permit;
- Army Corps of Engineers Nationwide Permit; and
- Ditch Company crossing permits.

Work on these permits is underway and the time required for approval is built into the design/construction schedule.

Easements: The project is being constructed mostly within private easements adjacent to existing road right of way. The majority of the Larimer County portion of the project is being constructed in an existing easement that was obtained by Northern Water in the late 1990's specifically for this second Southern Water Supply pipeline. The majority of the remaining right-of-way required for construction has been obtained by Northern Water over the past several years. The only remaining aquisitions involve City of Boulder and Boulder County Open Space parcels. Easements across these open space owned parcels have been approved by their respective boards and are currently in a 60-day waiting period to allow for public input. It is anticipated these easements will be finalized by mid-August 2017.

Agreements: Left Hand Water District's funding of the permitting and design portions of this project has been governed by 8 separate *Interim Agreements for Participation in SWSPII* between LHWD and Northern Water. The final agreement to be signed for participation in construction and future O&M costs of the Project will be an Allotment Contract similar to those used for the existing Southern Water Supply Pipeline that has been in operation since the 1990's. Northern Water anticipates having a draft Allotment Contract for consideration by our Board of Directors later in 2017, but prior to the bidding of the construction contract. Northern Water will enter into construction contracts for the construction of the pipeline. It is expected that payment for regularly submitted Request for Payment applications by the contractor will be made on a monthly basis by participants to Northern Water in accordance with the cost allocation worksheet (Appendix D). Northern Water will in turn make full payment to the contractor(s).

FINANCIAL FEASIBILITY ANALYSIS

Loan Amount: The Left Hand Water District proposes to apply for a $10,000,000 loan from the Colorado Water Conservation Board (CWCB) through the Water Project Loan Program with a 20-year term at a 2.85% interest rate (based on CWCB's most recently adopted high-income interest rate). The $10,000,000 loan amount includes CWCB's 1.0% loan origination fee of approximately $99,010. The total amount of funds available to the District from the loan will be approximately $9,900,990.

Financing Sources: The District anticipates funding approximately $10,735,000 of improvements. The CWCB loan will provide approximately $9,900,000 of those funds. The District anticipates funding the remaining $835,000 of project costs with a portion of its Unrestricted Reserves, which had a balance of $12,930,000 as of June 30, 2017.

The full cost of the project to all project participants is anticipated to be approximately $43,890,000, based on estimates provided by Northern Water in mid-July 2017. The City of Boulder is anticipated to provide approximately $32,011,000 of project funds, and Longs Peak Water District is anticipated to provide approximately $1,144,000 of project funds. Design and property acquisition costs have been funded by the participants according to their pro-rata share of the project capacity; prior to the start of construction, the participants will enter into Allotment Contracts with Northern Water to govern funding of and participation in the construction and future use of the pipeline.

Revenue and Expenditure Projections: Revenue and expenditure projections are provided in Appendix F.

Loan Repayment Sources: The District will repay the loan with net revenues derived from operating the District's water system. Net revenues represent gross revenue less operating and maintenance expenses. Gross revenues include any rates, fees, plant investment fees, line fees, and other operating revenues and charges for services provided by the water system.

Water rates are calculated annually, based on at least 8 years of historical costs, current costs and projected costs as well as historical, current and projected customer usage. The District's rate model program then calculates recommended rates based on the need as an enterprise and per District financial policy to cover the costs of operations, annual debt payments as well as a reserve to repair or upgrade existing infrastructure. The rates are approved by the District's Board of Directors. The District charges monthly base fees based on meter size, as well as

monthly water usage charges based on actual usage and the customer type (residential, dual-system, commercial, multi-housing, master meter, landscape, and bulk).

Tap fees consist of Plant Investment fees, Water Requirement fees, and Meter/Pit Installation fees. Plant Investment fees are reviewed annually and approved by the Board within the budget process, to ensure that such fees recover all direct and indirect costs of the existing water system. Such funds are used to pay for upgrades and maintenance of the current water system and to pay, all or in part, the costs of capital expenses attributable to new development as deemed appropriate. Water Requirement fees are the portion of the total tap fees charged by the District to new tap purchases, based on the current value of the water rights used to serve a given tap or development. Water Requirement fees are collected with new tap purchases when "cash-in-lieu" of water transfer is approved by the Board as part of the tap approval process. Water requirement fees are segregated in a Board-designated reserve to acquire or develop new sources of water supply. Meter/Pit/Installation fees are based on actual costs of the inventory and labor required to install new meters and pits.

The average monthly cost of water to a residential customer in the District in 2017 is $98.73, which includes $26.11 for a 5/8" meter, and $72.62 for 17,000 gallons of water, which is the average monthly usage.

Schedules of current water rates and fees are provided in Appendix G.

Financial Impacts: As of June 30, 2017, the District has $27,636,000 in total long-term debt, including approximately $907,000 from the District's 1999 Drinking Water Revolving Fund (DWRF) Loan from the Colorado Water Resources & Power Development Authority (CWRPDA) and approximately $26,729,000 from the District's 2014 DWRF Loan from the CWRPDA. The loan from CWCB will increase the District's outstanding debt to approximately $37,636,000, once the entire amount is drawn (the District anticipates drawing funds as project expenses become due over the period from April 2018 – September 2019).

As shown in the Schedule of Revenues and Expenditures in Appendix F, based on modest 2.00% annual increases in water rates, debt service coverage on outstanding debt after the CWCB loan will be over 3.00x debt service in all years except 2019, where it is anticipated to be 2.84x debt service. Excluding tap fees, debt service coverage is projected to be over 1.70x debt service in all years except 2019 and 2020, where it is anticipated to be 1.55x and 1.68x, respectively. The District has significant available cash on hand (1,771 days in the 2017 Budget), and the District projects days' cash on hand at greater than 1,350 days during the loan amortization period.

The District will not incur any direct future operating costs associated with this project, but will be responsible for annual assessment payments based on the participants' pro-rata share of the operating costs as determined by Northern Water.

The District is a participant in the Northern Integrated Supply Project (NISP), which is a proposed water storage and distribution project that will supply 15 Northern Front Range water providers with 40,000 acre-feet of water. The timing and size of the District's future financing requirements for NISP are uncertain and have not been included in the revenue and expenditure projections. Rate increases are anticipated to be higher than in the revenue and expenditure projections to account for additional debt associated with NISP.

Taxpayer's Bill of Rights ("TABOR") Issues: The loan from CWCB will not be subject to the limitations of TABOR since the District operates as an enterprise under TABOR. The performance of the obligations of the District is not subject to the limitations of TABOR as long as the water system continues to qualify as an enterprise under TABOR. The District does not require an election to incur additional multi-year debt and is not subject to the TABOR limitations on revenues and spending.

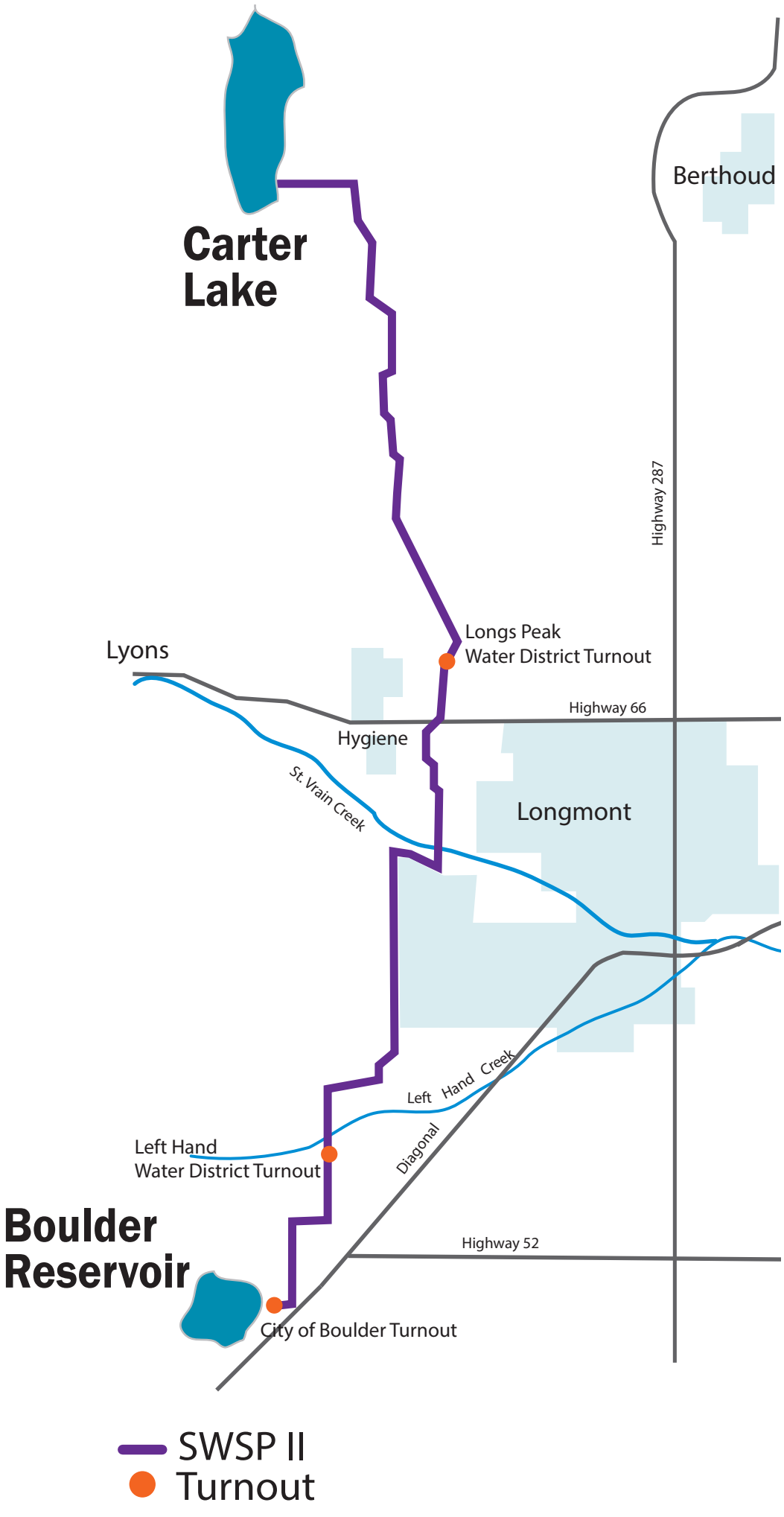
Collateral: The loan will constitute a revenue obligation of the District, payable from (i) amounts available in the District's Unrestricted Reserves from the net revenues derived from the operation of the water system, after deduction of operation and maintenance expenses and (ii) a the District's designated reserve account which is to be funded over a ten-year period in equal annual installments of approximately $70,000, at which time, it will amount to one annual debt service payment of approximately $700,000. The District anticipates that the loan will be on a parity lien with the District's outstanding 1999 and 2014 Drinking Water Revolving Fund Loans from the CWRPDA.

Sponsor Creditworthiness:

a) Current schedule of rates or assessments. See Appendix G.

b) Copies of the three most recent audit reports of financial statements. See Appendix H.

c) Credit report:
The District does not have an issuer credit rating. The District was last rated A3 by Moody's for its Water Revenue Refunding Bonds, Series 2004. The Moody's rating was withdrawn in 2014, when the District defeased the remaining outstanding principal.


Carter Lake
Berthoud
Highway 287
Longs Peak
Water District Turnout
Lyons
Highway 66
Hygiene
St. Vrain Creek
Longmont
Left Hand Creek
Left Hand
Water District Turnout
Diagonal
Boulder Reservoir
Highway 52
City of Boulder Turnout
SWSP II
Turnout

LYONS
LONGMONT
MEAD
FIRESTONE
Hwy 119
Hwy 36
Hwy 119 (Diagonal Hwy)
Hwy 287
Weld County Road 1
(County Line Road)
FREDERICK
I-25
Hwy 52
DACONO
ERIE
BOULDER
BROOMFIELD
LAFAYETTE
NORTHGLENN
THORNTON
LOUISVILLE

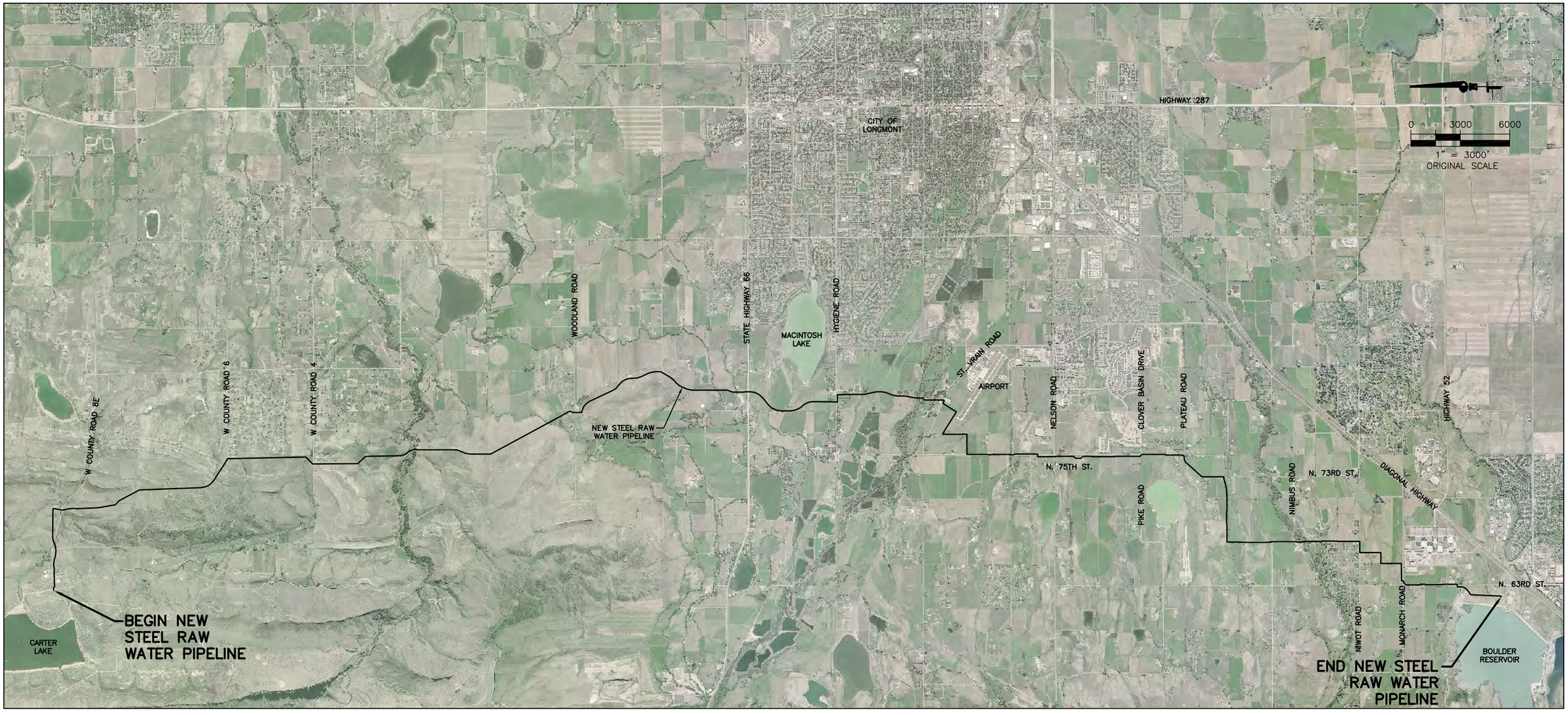
N

0 0.5 1 2
Miles

Legend

- LHWD Contiguous Boundary
- Other Areas Served by LHWD
- Lakes
- Railroads
- Roads
- Streams

Figure 1-1
Left Hand Water District
Current Boundary and
Adjacent Municipalities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1" = 3000'
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WOODLAND ROAD
STATE HIGHWAY 66
MACINTOSH LAKE
HYGIENE ROAD
ST. VRAIN ROAD
AIRPORT
NELSON ROAD
CLOVER BASIN DRIVE
PLATEAU ROAD
HIGHWAY 52
W COUNTY ROAD 8E
W COUNTY ROAD 6
W COUNTY ROAD 4
NEW STEEL RAW WATER PIPELINE
N. 75TH ST.
N. 73RD ST.
DIAGONAL HIGHWAY
NIMBUS ROAD
PIKE ROAD
N. 63RD ST.
NIWOT ROAD
MONARCH ROAD
CARTER LAKE
BEGIN NEW STEEL RAW WATER PIPELINE
BOULDER RESERVOIR
END NEW STEEL RAW WATER PIPELINE

Southern Water Supply Project II

Larimer County

Location and Extent

Prepared for:
Northern Colorado Water Conservancy District,
Acting by and through the
Southern Water Supply Project Water Activity Enterprise

In Partnership with:
City of Boulder
Left Hand Water District
Little Thompson Water District
Longs Peak Water District
Town of Frederick

Submitted to:
Larimer County
200 West Oak Street
Fort Collins, CO 80521

Prepared by:

EDAW | AECOM
240 East Mountain Avenue
Fort Collins, CO 80524

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Section 1. Introduction

This document provides documentation for the Larimer County Location and Extent review for the Southern Water Supply Project (SWSP II) proposed by the Northern Colorado Water Conservancy District (Northern Water), acting by and through the Southern Water Supply Project Water Activity Enterprise. The SWSP II is a planned water transmission pipeline, beginning at Carter Lake in Larimer County and extending south into Boulder County, with a terminus near Boulder Reservoir. The northern portion of the pipeline within Boulder County will parallel the original SWSP pipeline (constructed in 1995). From a point near Vance Brand Municipal Airport in Longmont, the proposed pipeline route diverges from the alignment of SWSP and follows a new alignment requiring the acquisition of new permanent and temporary construction easements. Beginning with a 60 inch pipe in the first leg paralleling West CR 8E, the pipeline transitions to a 45 inch diameter pipe at the first southern turn and progressively decreases in width at each turnout. Due to the heavy congestion of utilities paralleling West CR 8E, it was decided to install a larger 60 inch line through this segment to minimize the need to install an additional line if a future project required it. However, most of the pipeline alignment from this point forward would be 45 inches in diameter or less.

Another element of the project is a segment extending east from the main SWSP pipeline, from a point approximately ½ mile west of the intersection of 87th Street and Vermillion Road. This pipeline, which will serve the Longs Peak Water District, the Town of Frederick and the Little Thompson Water District, has a diameter of 24-26 inches, and will be located within and adjacent to the easement of the existing SWSP pipeline that serves the City of Fort Lupton, the Town of Hudson, the City of Fort Morgan and the Morgan County Quality Water District.

This submittal begins with a description of the proposed project and continues with discussion of the relevant provisions of the Larimer County Master Plan. Although some detailed information, such as typical cross-section illustrations, is provided in this document, it is only intended to indicate one of several possible solutions. A detailed project design will be performed in subsequent phases of the project process.
Purpose and Need

The SWSP II is a collaborative project between five water providers (participants) and Northern Water to provide a mechanism to convey Windy Gap and C-BT Project water from Carter Lake to each of the individual participants. Each of the five project participants is located in the northern Colorado Front Range within Northern Water and Municipal Subdistrict boundaries.

There are two principal objectives that would be accomplished by the project:
First, the existing open canal delivery systems serving the City of Boulder and Left Hand Water District, (the primary project participants), as well as other participants, have had a number of water quality problems that have not been specifically identified or resolved. There have been a number of isolated spikes in fecal coliform bacterial

contamination measurements in the Boulder Feeder Canal; however, a point source could not be located. Drinking water standards are becoming increasingly more stringent and the open canal delivery system is susceptible to tampering along the entire length of the canal with numerous publicly accessible road crossings. Transmission of water using a piped system would improve water quality and eliminate the potential risk of water quality degradation during delivery.

After September 11, 2001, the U.S. government recognized vulnerability in the country's drinking water supplies and developed the Bioterrorism Act (BTA) to help keep the nation's water supply safe. Prior to September 11, the Safe Drinking Water Act (SDWA) made sure that all tap water was free of contaminants and safe to drink. Title IV of the Bioterrorism Act of 2002 adds several provisions to the SDWA; these are known as the Drinking Water Security and Safety Amendments. One of these provisions stated that any community water system (CWS) that serves more than 3,300 people must complete a one-time assessment of its vulnerability to attack by June 2004. These assessments were sent to the EPA administrator in charge of that CWS, and are safeguarded so that the assessments are not distributed to unauthorized agents. Additionally, the CWS administrative team was in charge of updating or writing new emergency response plans based on the vulnerability assessments. The second provision requires the EPA administrator for each CWS to focus on prevention, detection and response. Part of this involves looking at the current methods of detection and making improvements if necessary. An enclosed pipe would leave only one potential contamination source at the inlet at Carter Lake, which is managed by the U.S. Bureau of Reclamation (Reclamation). Reclamation has its own security plan to reduce the risk of intentional contamination threats. In addition, the water volume and associated dilution factor at Carter Lake would make it a more difficult target to contaminate.

Secondly, the SWSP II would offer the ability to deliver year-round water supplies from Windy Gap and C-BT Project facilities. Presently, participants can only receive water deliveries between April 1 and October 31 through the St. Vrain Supply Canal and the Boulder Feeder Canal. The open canal systems are unable to deliver water during the winter months due to icing and associated consequences.

In addition, the SWSP II would maintain the current water supply needs as well as accommodate a small increment of future water supply needs. The SWSP II will eventually tie into water treatment plants in the future. All water delivered is intended for municipal use (residential and commercial). The SWSP II is not expected to deliver water for agricultural uses. There are no plans to increase capacity beyond 48 cfs in the future due to engineered design limitations of the pipeline. Table 1 lists the requested pipeline capacity for each participant with a summary of their purpose and need.

Table 1. Project participants and required demand

Participants	Capacity (cubic feet per second)	Purpose and Need
City of Boulder	25	Year-round delivery, improved security and water quality
Left Hand Water District	11	Year-round delivery, improved security and water quality
Little Thompson Water District	3	Year-round delivery, improved security and water quality, and increased supply
Longs Peak Water District	3	Year-round delivery, improved security and water quality
Town of Frederick	6	Year-round delivery, improved security and water quality, and increased supply
Total	48	

Source: Final Report SWSP II Project Feasibility Study, January 6, 2006, Page 2

Project Description and Location

In 1995, the original SWSP pipeline (Carter Lake to Broomfield Pipeline) was constructed from the St. Vrain Supply Canal diversion structure at Carter Lake south to its terminus at the City of Broomfield's then new water treatment plant and storage reservoir located northeast of the intersection of Sheridan Boulevard and 144th Avenue, a length of approximately 33.5 miles. The original project was a collaborative effort between 12 project participants and Northern Water to convey Windy Gap and C-BT Project water from Carter Lake to each participant delivery point. Since construction of the original pipeline, Northern Water has constructed two booster pumping stations along the existing pipeline to increase flow rates in order to meet additional water demands of the original project participants. The capacity of the original pipeline is now fully utilized.

In 1998, the eastern phase of the SWSP was constructed from a point ½ mile west of the Intersection of North 87th Street and Vermillion Road east to a treatment plant in Weld County located northeast of the City of Fort Lupton, a length of approximately 29 miles. The eastern phase was constructed to serve the City of Fort Lupton, the Town of Hudson, the City of Fort Morgan and the Morgan County Quality Water District.

Due to interest shown by water providers within Northern Water and Municipal Subdistrict, Northern Colorado Water Conservancy District (Subdistrict) boundaries to construct a second pipeline, Northern Water and the project participants (consisting of new participants) have proposed to construct the SWSP II to improve water quality, provide a year-round water supply, and meet new demands.

The SWSP II project will deliver Windy Gap and Colorado-Big Thompson (C-BT) Project water from the existing diversion structure on the St. Vrain Supply Canal near Carter Lake, to delivery locations, that include the City of Boulder's Boulder Reservoir Water Treatment Plant, Left Hand Water District Dodd Treatment Plant, and a turnout for an eastern pipeline to serve the Town of Frederick, the Longs Peak Water District, and the Little Thompson Water District. The project will provide improved water quality and greater reliability to the participants served.

The SWSP II alignment will parallel the existing SWSP easement for the northern portion of the project, extending from Carter Lake through Larimer County to where the alignments diverge at St. Vrain Road near the Longmont Vance Brand Municipal Airport (Map 1). An initial feasibility study was prepared in January 2006 (Integra Engineering) that examined potential alternative routes for the SWSP pipeline. The route evaluation considered 55 route alternatives and concluded that an alignment parallel to the existing pipeline (where possible) is the best option. Significant benefits of a parallel alignment include no new, or limited new, permanent easement acquisition, limited environmental and land use impacts, limited constructability issues, and potentially lower project costs. As a result, the existing SWSP pipeline route is the proposed route alignment for the majority of the new pipeline. Just north of the Longmont airport, the two routes diverge; the existing SWSP follows a more easterly route, while the SWSP II route continues south to the delivery point near Boulder Reservoir. From the point where the two routes diverge, the SWSP II route is on a new alignment that will require the acquisition of additional permanent and temporary construction easements.

Another element of the project is a segment extending east from the main SWSP pipeline, from a point ½ mile west of the intersection of 87th Street and Vermillion Road. This pipeline, which will serve the Town of Frederick, Longs Peak Water District, and the Little Thompson Water District, has a diameter of 24-26 inches, and will be located within and adjacent to the easement of the existing SWSP pipeline that serves the City of Fort Lupton, the Town of Hudson, the City of Fort Morgan, and the Morgan County Quality Water District.

Following a review by Larimer and Boulder Counties, Northern Water will begin easement acquisitions and final design activities. The final design process will take into account property-specific factors that result from a detailed corridor survey and coordination with individual property owners. During the design process, specific utility locations will be identified to finalize the pipeline's location. Northern Water will continue to work with the County Departments and other service providers to avoid conflicts with existing and future utilities.

Construction of the project will likely begin between 2012 and 2013. The typical pace for constructing the pipeline will most likely range between 200 to 400 feet per day, depending on the specific complexity of the alignment corridor. Limited short-term road closures may be necessary and typically do not last more than a few days. A traffic control plan will be developed to provide an alternative traffic route.

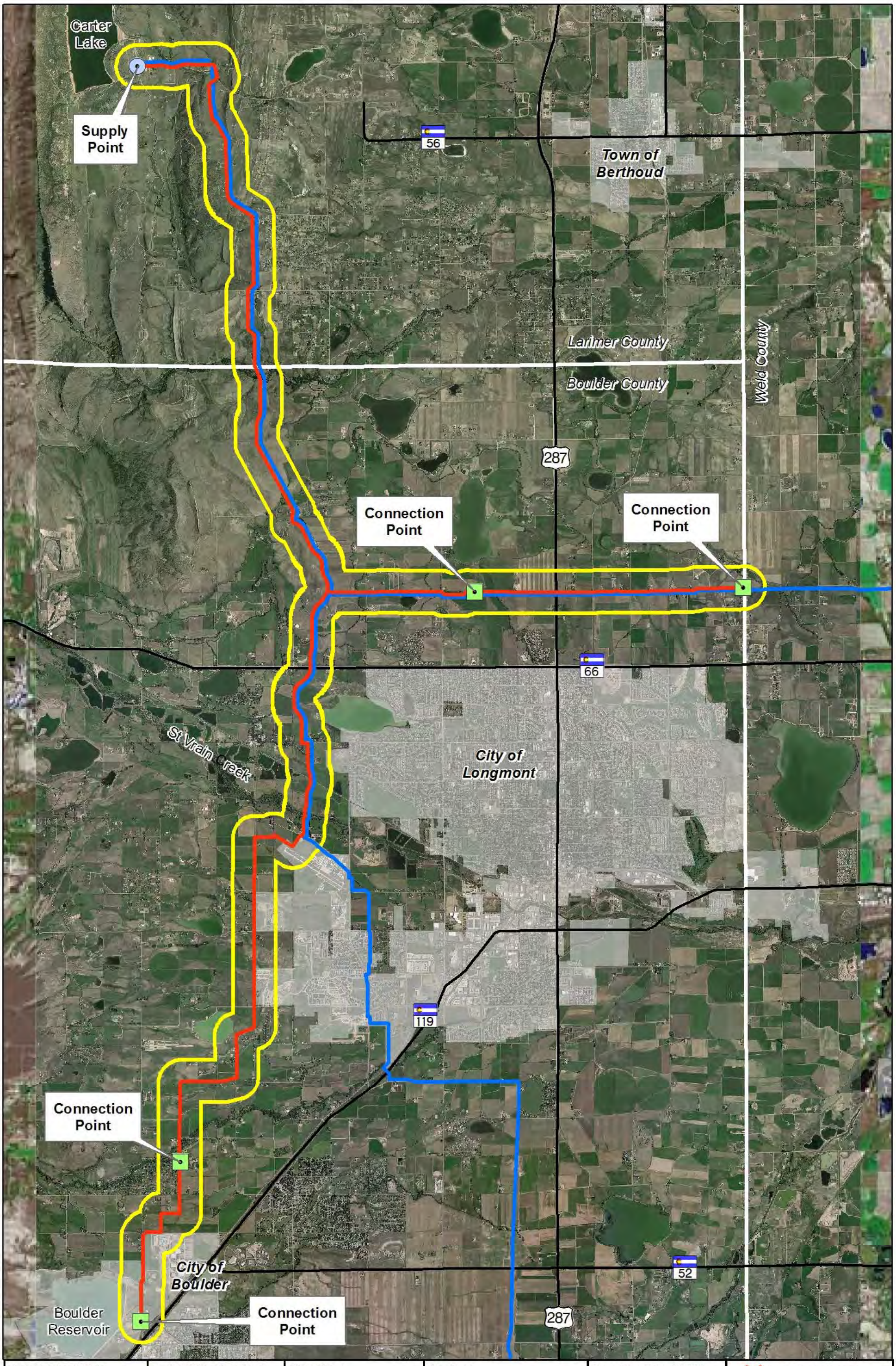
Full restoration of the surface, including fencing, drain tiles, irrigation systems, landscaping, private roads and other improvements will take additional time, but will be completed as soon as seasonal requirements allow. Once the pipeline is buried and the ground surface is restored, the pipeline will be unnoticeable. Northern Water's easement agreements allow approved landscaping, crops, driveways, and parking lots to be placed over the pipeline. The placement of trees and permanent building and structures will not be allowed within the permanent easement. The previous SWSP provides a good demonstration of how little impact to the land and natural resources this project will have when proper construction zone restoration and revegetation techniques are employed. In most areas, the SWSP construction disturbance is difficult to locate.

Photograph 1. Example of pre-construction conditions of the original SWSP, near Woodland Road.

Photograph 2. Example of construction of the original SWSP, near Woodland Road.

Photograph 3. Example of post-construction restoration of the original SWSP, near Woodland Road.

No trees were removed during construction. Trees that are not in the above photograph were removed by the property owner several years after the original construction of the SWSP.



Map Number & Title:	Project Title & Applicant	Consultant	Engineer	Preparation Date: 8/21/08	Selected Pipeline Alignment Existing SWSP Pipeline Study Area (3000ft wide) 0 0.5 1 Miles
Map: 1 **Overall Selected Alignment**	Southern Water Supply Project II NCWCD 220 Water Ave. Berthoud, CO 80513 (970) 532-7700	EDAW|AECOM 240 East Mountain Ave. Fort Collins, CO 80524 (970) 484-6073	Integra Engineering 1095 South Monaco Parkway Denver, Colorado 80224 (303) 825-1802	Revision Date 1: Revision Date 2: Revision Date 3:	

Public, Stakeholder, and Agency Involvement

Larimer County, Boulder County, City of Longmont, City of Boulder, and project participants have been contacted and involved in the planning of the SWSP II project. All of the property owners affected by this project have been contacted by phone and by newsletter. Two public open houses were held at the Northern Colorado Water Conservancy District office on June 10, 2008 and at Left Hand Water District Office on June 12, 2008. All affected property owners were notified of the open houses. Most of the verbal comments received were neutral; however, one land owner was opposed to the project crossing their property near the Sedona Hills community entrance. They also stated that a species of *Mentzelia*, potentially wavy-leaf stickleaf (*Mentzelia sinuata*) may be found near the intersection of Sedona Hills Dr. and CR8E. Although this species is ranked as G3[1] and S2[2] by CNHP, it does not have any federal or state regulatory protection. No surveys were conducted for this species during this project field work. In addition to these open houses, Larimer County may conduct a hearing during its location and extent review. Larimer County does not a have a requirement to notify surrounding property owners as part of the Location and Extent submittal.

[1] **G3 - Vulnerable—**At moderate risk of extinction or elimination due to a restricted range, relatively few populations, recent and widespread declines, or other factors.

[2] S2 - **Imperiled**—Imperiled in the jurisdiction because of rarity due to very restricted range, very few populations, steep declines, or other factors making it very vulnerable to extirpation from jurisdiction.

1.4 Description of the Project Alternatives

One of the main objectives of the original feasibility study completed in January 2006 was to determine an optimum pipeline route to deliver the required flows to each participant's delivery point. This section documents the pipeline route alternatives evaluation process utilizing both qualitative and quantitative criteria described in the original feasibility study report. The section begins with the development of preliminary proposed route alignment segments and continues through to selection of the proposed pipeline route.

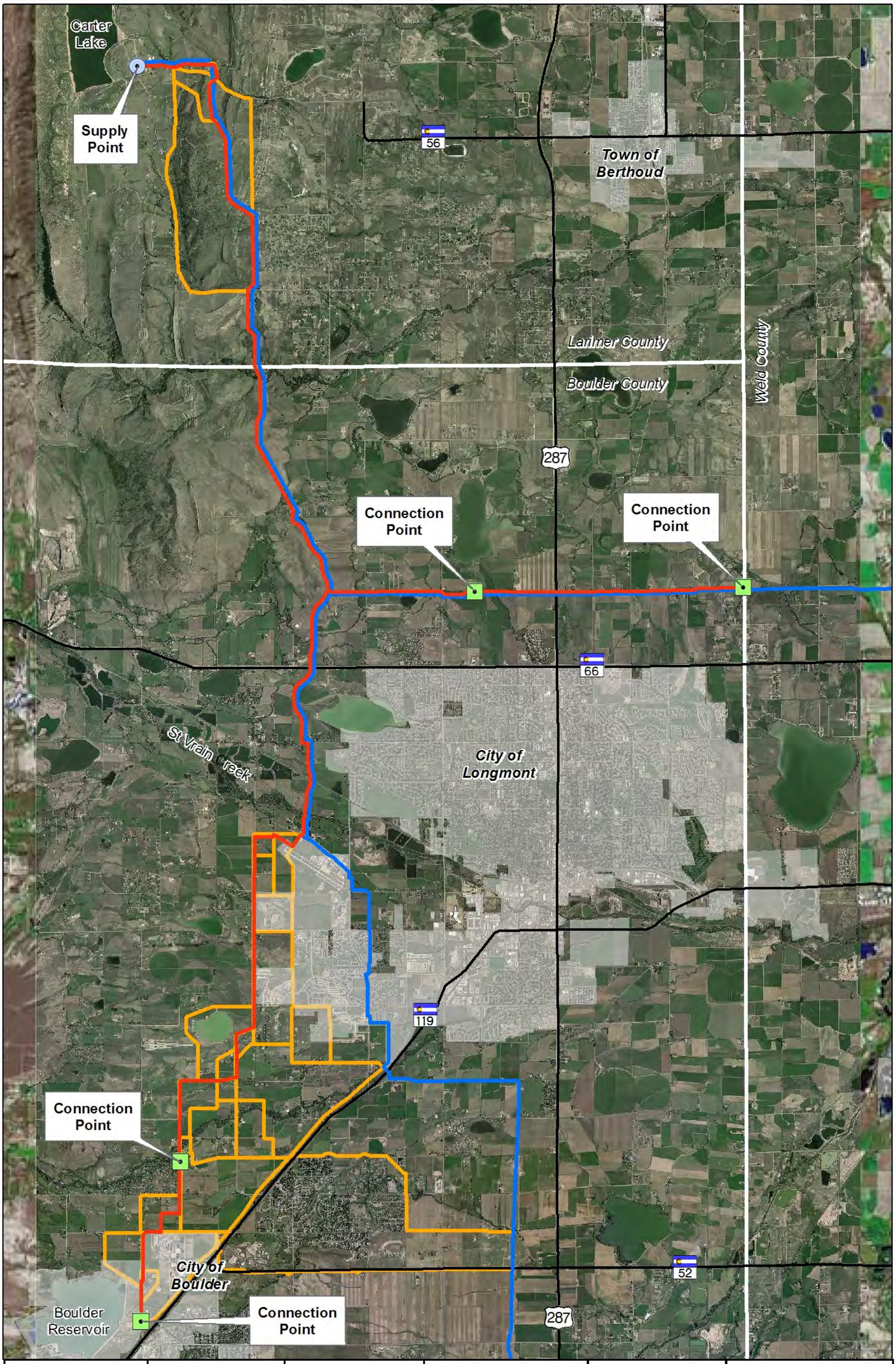
1.4.1 Development of Pipeline Route Alternatives

Alternatives were developed using each participant's specific delivery point, required hydraulic grade line at the delivery point, and the participant's required delivery flow rate. The selected alternative parallels the existing SWSP pipeline, which extends from the St. Vrain Supply Canal at Carter Lake south to its terminus at the City of Broomfield, for much of the route. Benefits of paralleling the existing alignment include limited new permanent easement acquisition, limited environmental and public impacts, limited constructability issues, and potential lower project costs. As a result, the existing SWSP pipeline route was considered as the primary route alternative for the majority of the new SWSP II pipeline.

The locations where alternative pipeline routes were investigated are shown in Map 2.

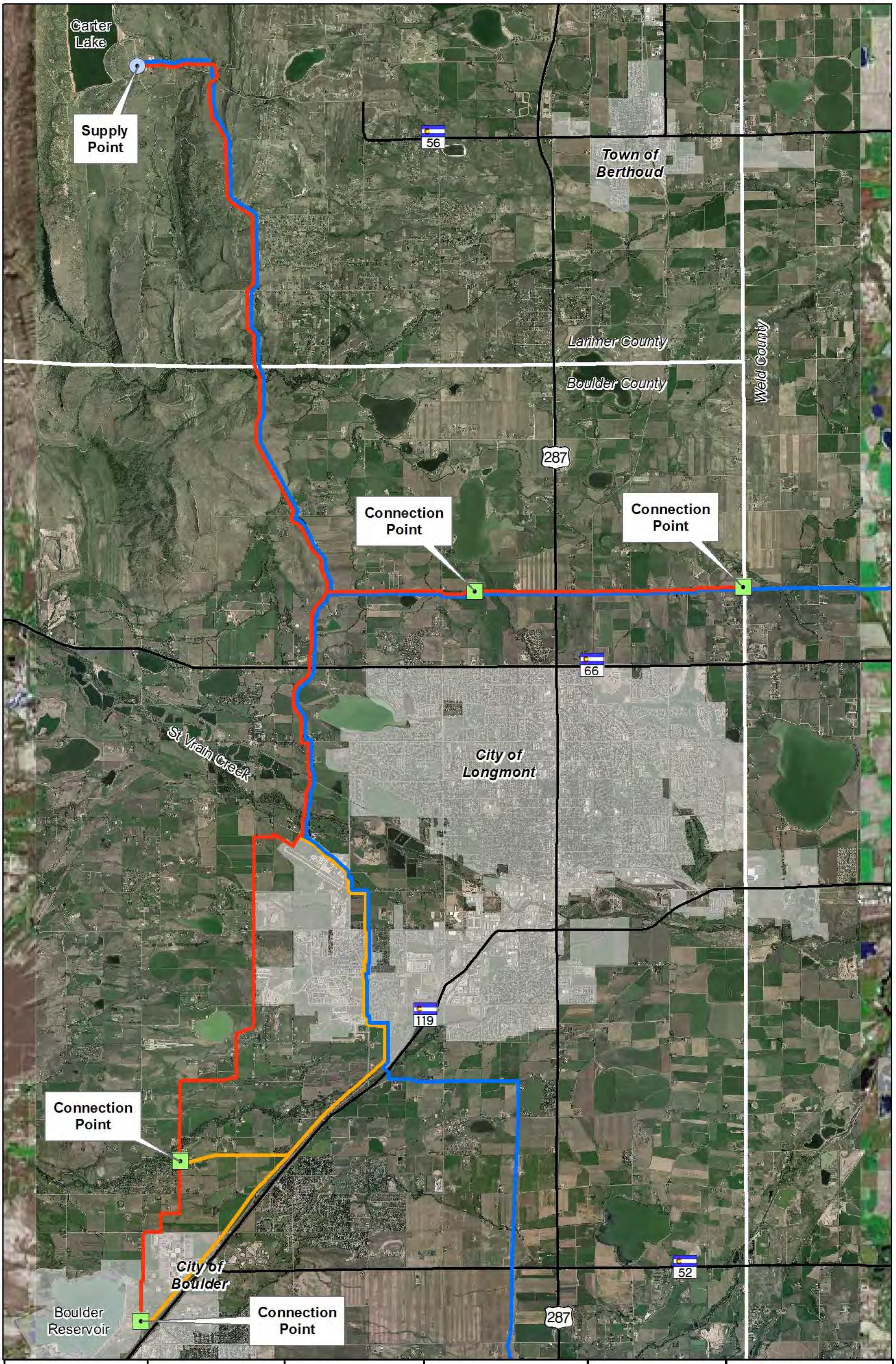
Beginning at St. Vrain Road on the north side of the Longmont Vance Brand Municipal Airport, more than 40 alternative route segments were generated to achieve water deliveries to the Left Hand Water District Dodd Water Treatment Plant (LHWD Dodd WTP) and the City of Boulder's Boulder Reservoir Water Treatment Plant (WTP). Generally speaking, the alternative alignments were developed by examining existing corridors, such as roadways, railroads or railroad beds, canals, pipelines or existing utilities, and boundaries of land parcels. These alternative route segments were initially screened based upon a series of qualitative criteria, including a consideration of environmentally sensitive areas, future development, property boundaries, and existing rights-of-way. The initial qualitative criteria screening reduced the number of feasible route segments to approximately 35 individual segments. The remaining alternative segments were then subjected to a quantitative analysis, which included estimated construction costs for each individual segment.

Finally, a combined analysis of both quantitative and qualitative scores for each route alternative was utilized to arrive at two (2) alternative routes in the Southwest reach. These routes were the most cost effective routes that provide relatively distinct alternative routes for delivery of flows to the LHWD Dodd WTP and the Boulder Reservoir WTP (see Map 3). Map 4 shows only the Alternative 2 alignment.

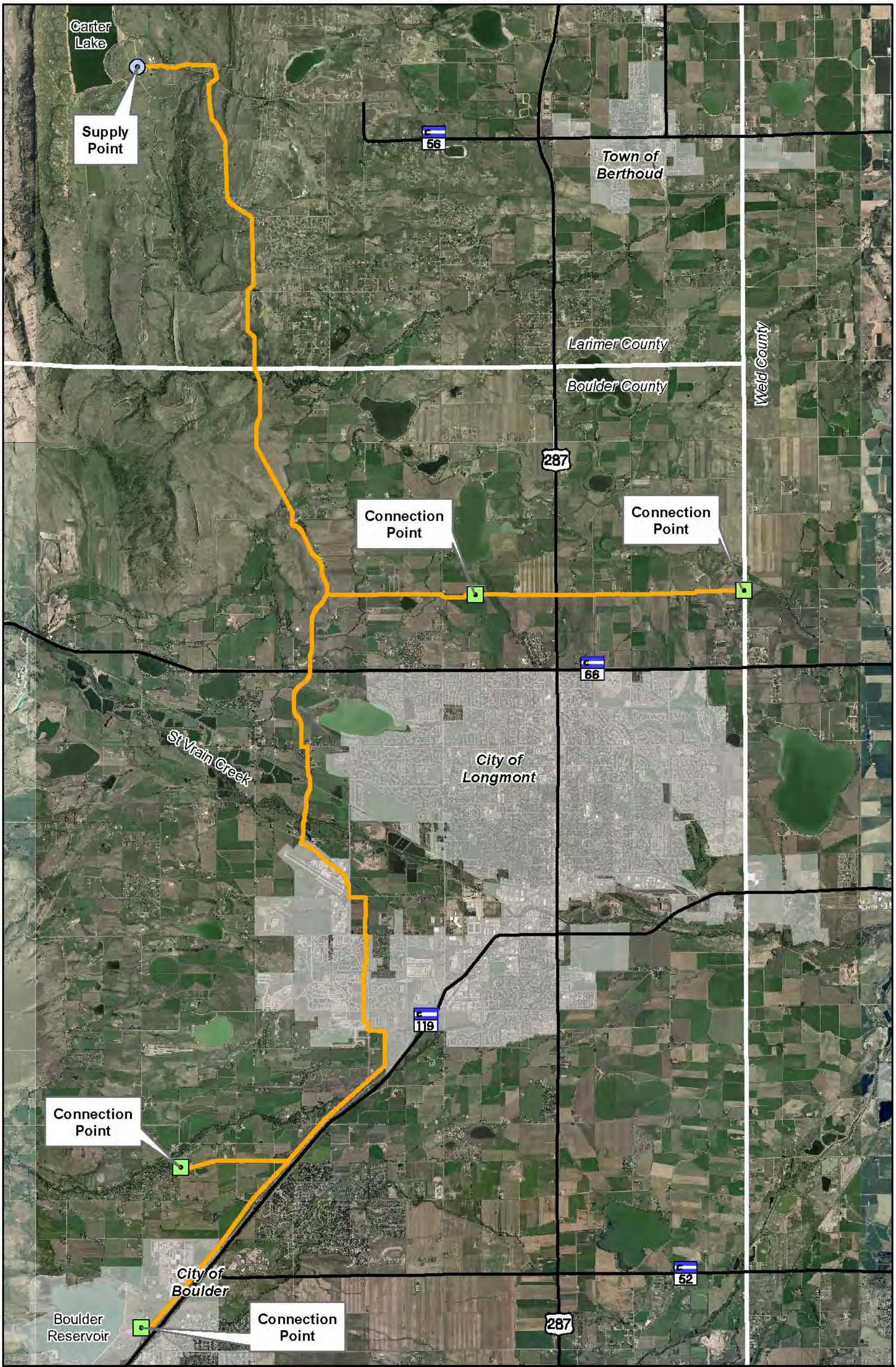


Map Number & Title:	Project Title & Applicant	Consultant	Engineer	Preparation Date: 8/21/08
Map: 2 **Overall Alternative Alignments**	Southern Water Supply Project II NCWCD 220 Water Ave. Berthoud, CO 80513 (970) 532-7700	EDAW|AECOM 240 East Mountain Ave. Fort Collins, CO 80524 (970) 484-6073	Integra Engineering 1095 South Monaco Parkway Denver, Colorado 80224 (303) 825-1802	Revision Date 1: Revision Date 2: Revision Date 3:

Selected Pipeline Alignment
Alternative Evaluated Alignments
Existing SWSP Pipeline
0 0.5 1 Miles



Map Number & Title:	Project Title & Applicant	Consultant	Engineer	Preparation Date: 8/21/08	Alternative Alignments Evaluated Selected Pipeline Alignment Existing SWSP Pipeline 0 0.5 1 Miles
Map: 3 **Final** **Alternatives**	Southern Water Supply Project II NCWCD 220 Water Ave. Berthoud, CO 80513 (970) 532-7700	EDAW|AECOM 240 East Mountain Ave. Fort Collins, CO 80524 (970) 484-6073	Integra Engineering 1095 South Monaco Parkway Denver, Colorado 80224 (303) 825-1802	Revision Date 1: Revision Date 2: Revision Date 3:	



Map Number & Title:	Project Title & Applicant	Consultant	Engineer	Preparation Date: 8/21/08
Map: 4 Evaluated Alternative	Southern Water Supply Project II NCWCD 220 Water Ave. Berthoud, CO 80513 (970) 532-7700	EDAW|AECOM 240 East Mountain Ave. Fort Collins, CO 80524 (970) 484-6073	Integra Engineering 1095 South Monaco Parkway Denver, Colorado 80224 (303) 825-1802	Revision Date 1: Revision Date 2: Revision Date 3:

Alternative Alignments Evaluated

0 0.5 1 Miles

1.4.2 Selection of Complete Pipeline Route Alternatives

Compared to the selected route, Alternative 2 has significantly greater impacts, including:

- Greater impacts to agricultural lands of national, state, and local importance
- Greater impacts to residences and commercial properties; and
- Significantly greater transportation disruptions

These higher impacts for Alternative 2 are primarily the result of two reaches: the segment along the existing SWSP alignment through the City of Longmont, and the reach along Highway 119 from Left Hand Creek to Highway 52.

The Alternative 2 alignment through the City of Longmont follows the existing SWSP pipeline. However, since the original pipeline was constructed, significant development has occurred over nearly a 3-mile length. This development has resulted in surface improvements in the existing easement, multiple residential Homes abutting the easement boundaries, and numerous and significant parallel and crossing utilities. Additionally, the Airport Road corridor is a high volume traffic corridor that would be significantly impacted during construction of the new SWSP II pipeline The Alternative 2 Highway 119 alignment would also traverse nearly 4,000 feet of floodplain and riparian habitats associated with Left Hand Creek, and then traverse several agricultural lands of national, state, or local significance south of Left Hand Creek.

For these reasons, the City of Longmont has expressed their opposition to the Alternative 2 alignment at a meeting with the project team May 9, 2007.

The selected (Alternative 1) alignment has no high impact areas and will result in lower impacts to residential properties, riparian habitats, trees, and transportation than Alternative 2.

Although the estimated construction cost for Alternative 2 is approximately 6% higher than the selected alternative, qualitative criteria were the primary factors for selecting Alternative 1

A comparison of impacts is provided in Table 2.

Table 2. Comparison of alternatives.

Qualitative Criteria		Alt. 1 (Selected Alternative)	Alt. 2
Land Use	Agricultural		
	Use of Existing Easements / ROW		
	Residential / Commerical Impacts		
	Recreation / Open Space		
Water Resources	Streams / Creeks		
	Floodplain		
	Stormwater Detention		
Visual Resources	Natural Landmarks		
	Difficult Restoration Areas		
Transportation Impacts			
Biological Resources	Wetlands		
	Riparian Habitat / Rare Plant Areas		
	Critical Wildlife Areas		
	T&E Species		
	Trees		
Cultural Resources			
Geotechnical / Geological	Extreme Slopes / Potential for Mass Movement		
	Subsidence		
Agency Coordination/Permitting			

Highest Effect
Moderate Effect
Lowest Effect

Source: Integra Engineering

A more complete discussion of the route development and evaluation process is provided in the 2006 Feasibility Study prepared by Integra Engineering (included electronically on the attached CD).

No alternatives were considered for the eastern segment of the project along Vermillion Road. This segment is located adjacent to the existing eastern phase of the SWSP pipeline and primarily utilizes existing SWSP permanent easements, it is anticipated that Northern Water will need to acquire an additional 20-feet of permanent easement for the SWSP II pipeline.

1.4.3 Selected Pipeline Route Description

The selected SWSP II pipeline begins at the existing diversion structure at the St. Vrain Supply Canal near Carter Lake and runs generally south to the Boulder County line, following the alignment of the existing SWSP pipeline. From the St. Vrain Supply Canal to the eastern turnout located west of the intersection of North 87th Street and Vermillion Road, the existing permanent easement is 90 feet in width.

After crossing the Little Thompson River at the Larimer-Boulder County line, the selected route continues nearly due south for just under 1 mile where it intersects an existing overhead power transmission utility. From this point, the pipeline turns southeast, paralleling the overhead power line for approximately 1 mile until the pipeline intersects Woodland Road. After Woodland Road, the pipeline continues southeasterly a little over 1 mile to the existing eastern turnout, generally following the overhead power line, though not exactly parallel.

At this point, the pipeline turns southwesterly for approximately 2,000 feet until again turning south and continuing to State Highway 66, crossing the Highland Ditch, the Rough & Ready Ditch, and the Supply Ditch along the route. After crossing Highway 66, the pipeline continues south around the west side of McIntosh Lake on Boulder County Open Space property and then continues south a little over 1 mile to the intersection of Hygiene Road. After crossing Hygiene Road, the pipeline turns east for approximately 400 feet and then resumes a southerly alignment, crossing the Burlington Northern Santa Fe railroad and the St. Vrain River until reaching St. Vrain Road. From Hygiene Road south to St. Vrain Road, the City of Longmont's 36-inch diameter Clover Basin Pipeline is also proposed to parallel the existing SWSP pipeline within the existing permanent easement. From the eastern turnout located ½-mile west of the intersection of North 87th Street and Vermillion Road to St. Vrain Road, the existing permanent easement is 80-feet in width. This length of pipeline traverses generally open agricultural property along with a few residential acreages.

The SWSP II route diverges from the original SWSP pipeline alignment on the south side of St. Vrain Road, skirting the Longmont Vance Brand Municipal Airport and heading west across the Clover Basin Ditch to North 75th Street. After crossing to the west side of North 75th Street, the alignment then turns south and parallels North 75th Street for approximately 2,500 feet and makes a minor jog 30 feet to the west to avoid a power line. The pipeline continues south, paralleling North 75 Street between a windrow of trees and crossing Clover Basin Ditch, Peck Ditch, a wet meadow, and an unnamed drainage. The pipeline route crosses Nelson Road and continues south across North Dry Creek, James Ditch, and Pike Road to a point just east of Lagerman Reservoir. At this location, the route continues south west along the north side of Dry Creek for approximately 1,300 feet before crossing over Dry Creek and turning south. From this location, the alignment continues south across a wet meadow, crosses North 73rd Street, and continues along the east side of North 73rd Street for approximately 1,300 feet to the Holland Ditch. Here, the alignment turns west, crosses North 73rd Street a second time, and continues west along the north side of the Holland Ditch for approximately 4,000 feet. The alignment would then turn due south for approximately 6,000 feet, crossing Nimbus Road and Left Hand Creek, to the LHWD Dodd WTP. From the LHWD Dodd WTP, the alignment would continue due south approximately 4,500 feet to the north side of Monarch Road, crossing Niwot Road along the way. At Monarch Road, the alignment turns east along the north side of Monarch Road to North 71st Street. At North 71st Street, the alignment turns south to Boulder Reservoir WTP just north of Highway 119.

The eastern segment of the project begins approximately ½-mile west of the intersection of North 87th Street and Vermillion Road. This segment of the pipeline typically has an existing 50-foot wide permanent easement and the pipeline typically traverses open pasture lands with few improvements in this length. The eastern segment parallels Vermillion Road and jogs around (to the south) two separate residences near 95th Street. The pipeline crosses to the north side of Vermillion Road, approximately 1,000 feet west Vermillion Trail and continues east to the Weld County line.

1.4.4 Easement Requirements

Permanent Easement

The portions of the proposed SWSP II pipeline alignment alternatives, which parallel the existing SWSP Broomfield pipeline and will serve the City of Boulder and Lefthand Water District, are anticipated to be constructed within the existing permanent easement, requiring no new permanent easement acquisition. The existing permanent easement ranges between 80-90 feet in width and should provide adequate space to construct a parallel pipeline. The portions of the alignment that diverge from the existing SWSP pipeline alignment will require the acquisition of new permanent easement, typically 80 feet in width.

The eastern phase of the SWSP II which will serve Little Thompson Water District, Longs Peak Water District and the Town of Frederick will parallel the existing eastern phase of the SWSP. The SWSP II will utilize a portion of the existing 50-foot wide permanent easement, however, an additional 20-feet of permanent easement will be required in order to safely construct, operate, and maintain the eastern section of the SWSP II.

Temporary Construction Easement

The original SWSP pipeline project typically utilized an additional 20 feet of temporary construction easement. It is anticipated that 20 feet of temporary construction easement will also be obtained for the proposed SWSP II pipeline. The 20 feet of temporary construction easement will have to be acquired for the entire length of the proposed alignment, even in those portions where the proposed pipeline will parallel the existing SWSP pipeline.

The eastern phase of the SWSP project utilized an additional 40 feet of temporary construction easement. Since an additional 20 feet of permanent easement will be acquired Northern Water will need to acquire an additional 20 feet of temporary construction easement for the entire length of the proposed eastern alignment.

Typical Pipeline Construction Corridors

As noted previously, the typical permanent easement width for this study is assumed to be 80 feet, with 20 additional feet of temporary easement obtained for the Lefthand Water District and City of Boulder construction. A typical permanent easement width is

70 feet; Northern Water presently owns a 50-foot wide permanent easement. Therefore, 20 additional feet of permanent easement and an additional 20 feet of temporary construction easement will be obtained for the eastern phase of the SWSP II. To achieve an efficient pipeline construction project, adequate space for the following construction components needs to be provided:

- Safe excavation of the pipeline trench (dependent upon soil types and conditions)
- Stockpiling and maintenance of topsoil (strippings)
- Stockpiling of excavated material (spoil)
- Delivery and stockpiling of pipe bedding material
- Delivery and layout (stringing) of pipe
- Delivery of pipeline appurtenances, concrete, other construction materials
- Execution of dewatering activities, welding, appurtenance construction
- Movement of construction equipment alongside excavation, backfill operations

Construction widths' ranging from 90 to 110 feet total, available for construction of pipelines ranging from 28 to 60 inches in diameter, provides adequate space for the contractor to efficiently perform the above listed tasks and maintain a good production rate, resulting in faster construction and lower pipeline installation costs.

It should be noted that some variations will occur in the typical cross-section shown due to variations in width of the existing SWSP easement. Where the proposed SWSP II pipeline would be parallel to the existing SWSP pipeline, it will be located within the existing 50 to 90 foot wide permanent easement. Figure 1 shows a typical construction corridor cross-section where the proposed SWSP II pipeline is parallel to the existing SWSP pipeline and within the existing easement. Figure 2 shows a typical construction corridor cross-section where the proposed SWSP II pipeline will require new easement. Figure 3 shows a typical cross-section of the eastern phase of the SWSP II pipeline which will utilize 70 foot permanent easement (Northern Water presently owns a 50 foot permanent easement an additional 20 feet will need to be acquired) and an additional 20 foot temporary construction easement. With a gross estimation of 110 foot (maximum) wide construction impact (permanent and temporary construction easements), a maximum of 352 acres would need to be restored to existing conditions.

As the project is further refined, construction widths may be narrowed for short distances to reduce impacts to environmentally sensitive areas (particularly stream or creek crossings), existing residences or surface improvements, or other constraints. At these locations, the zone of disturbance can be reduced to a width of approximately 50 feet. Creek crossings will be performed via open trench during low flow periods in the winter months. In addition to being constructed during low flow periods, the riparian corridors will be dormant and most of the wildlife activity will be either hibernating, (such as mammals and amphibians), or will have migrated south (as the case of birds). Most aquatic species, such as fish, will have moved to deeper pools. Open trench construction is considered safer because of the potential for tunnel breach or collapse.

Construction is expected to cross the creeks within one to two days, even with a confined work area in environmentally sensitive areas.

Figure 4 shows a typical construction corridor cross-section narrowed to 50 feet in width. Narrowing the construction corridor to 50 feet is a significant constraint for pipeline installation and cannot be effectively maintained for long distances.

1.4.5 Environmental Commitments

The project will be designed and constructed in a manner that minimizes both short-term and long-term effects on land use and environmental resources. A complete discussion of these measures is provided in the Appendices.

Figure 1. Existing 90-foot permanent easement and 20-foot temporary construction easement.

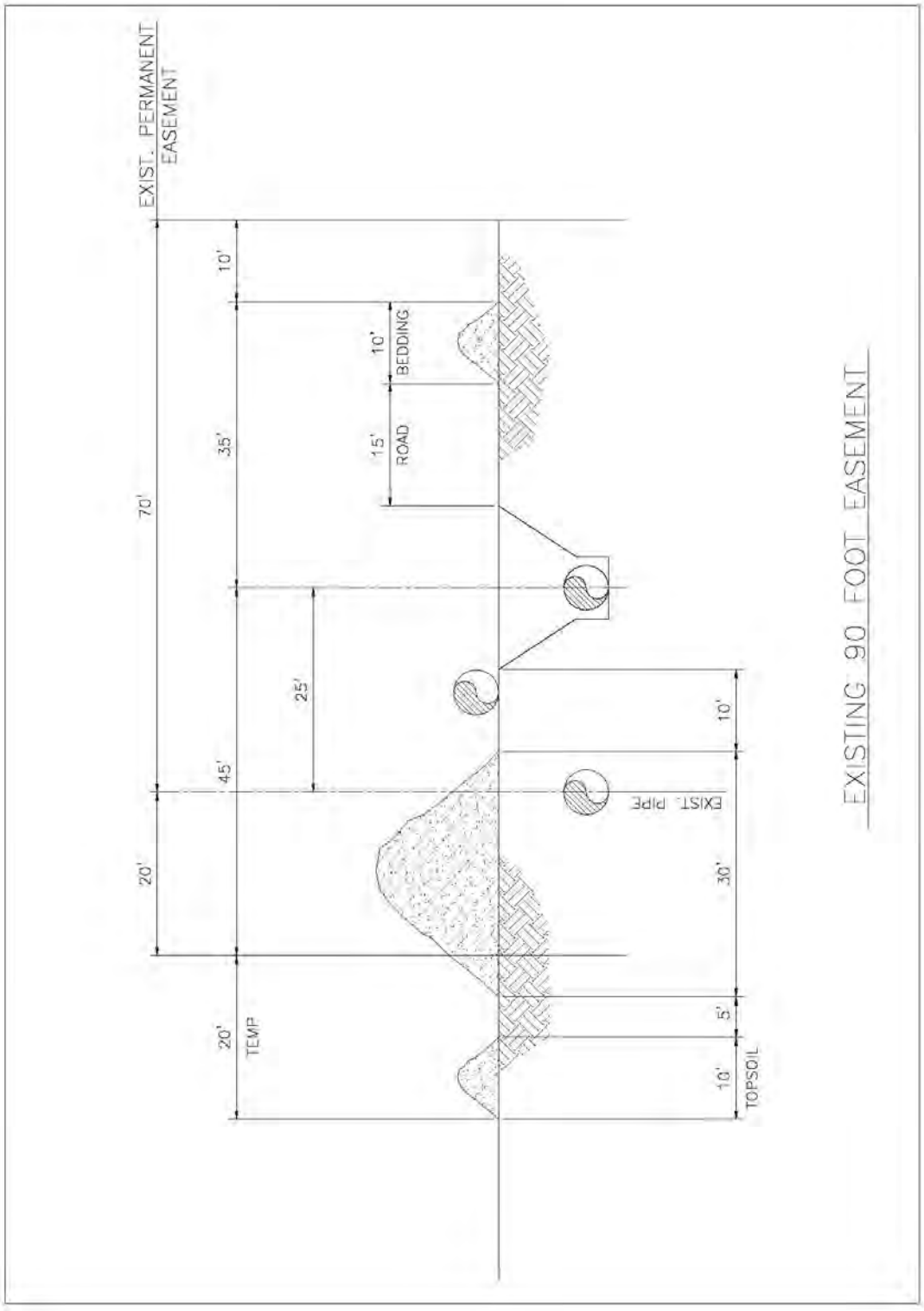


Figure 2. New and existing 80-foot permanent easement and 20-foot temporary construction easement.

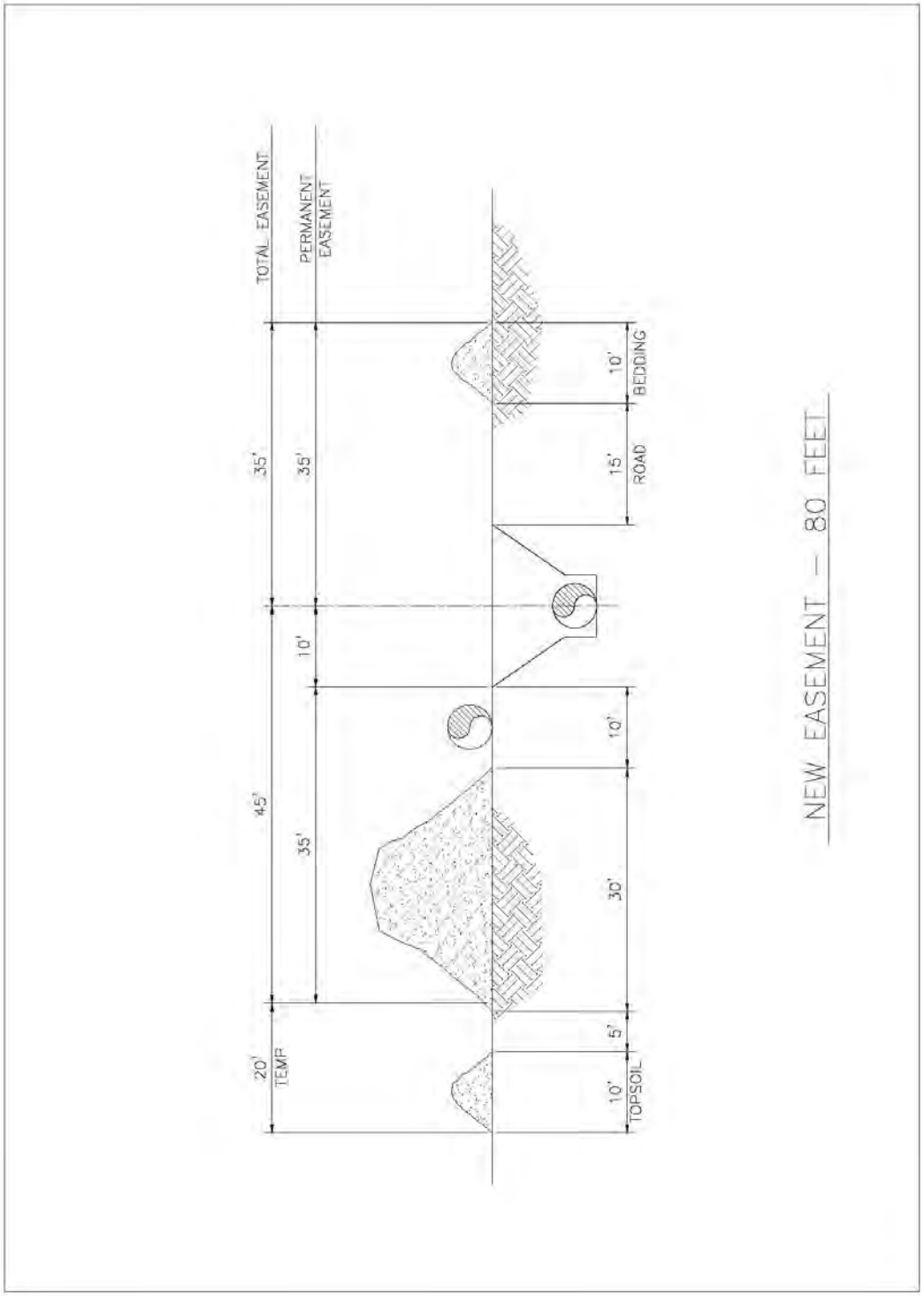


Figure 3. Eastern phase 70-foot permanent easement and 20-foot temporary construction easement.

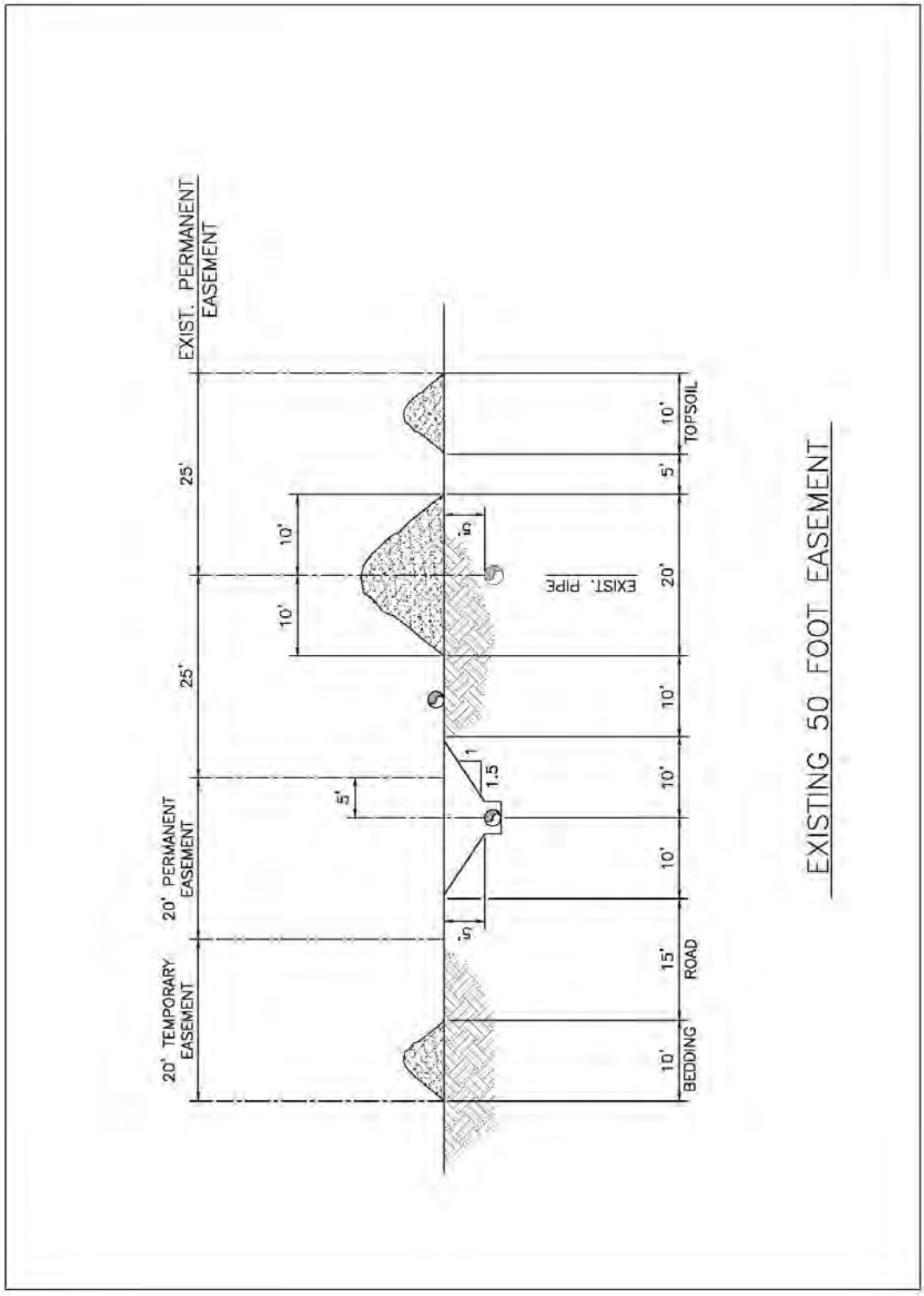
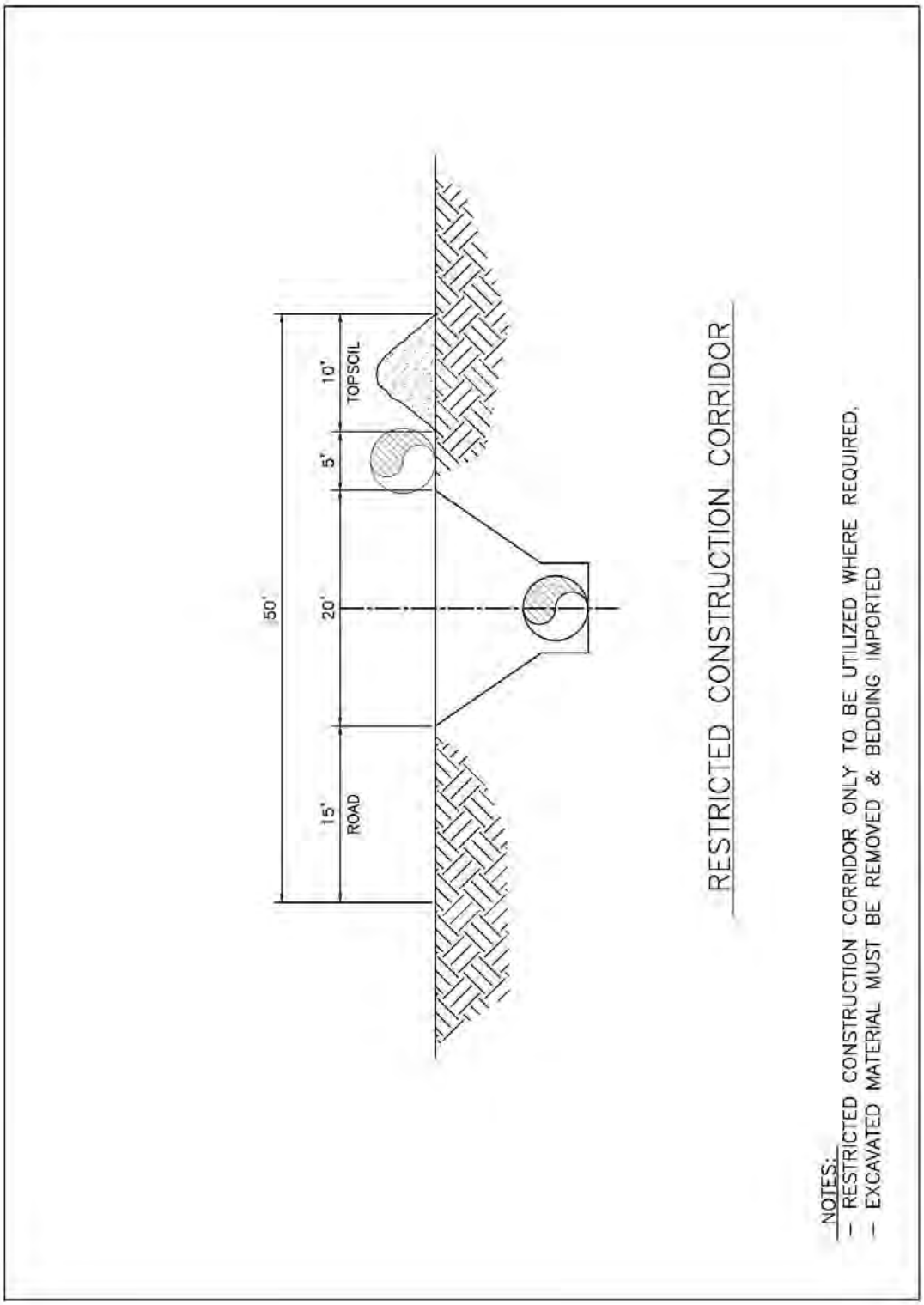


Figure 4. Restricted 50-foot construction corridor.



Section 2. Larimer County Master Plan Policy Comparison

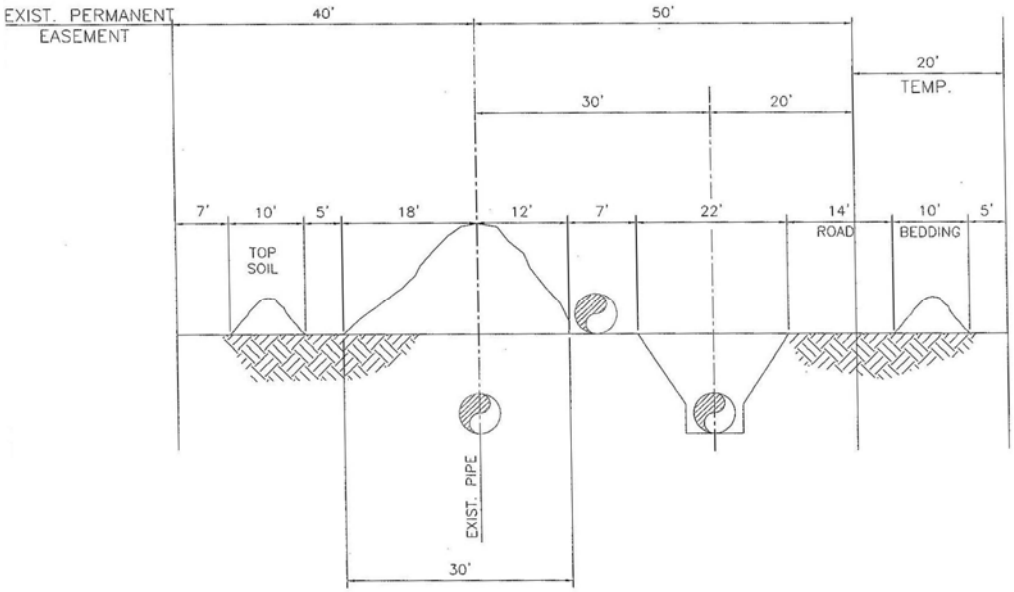
The Larimer County Master Plan (Partnership Land Use System) was adopted on November 19, 1997. The master plan contains a comprehensive set of policies intended to guide land use within unincorporated areas of Larimer County. Many of these policies are directed at residential development, transportation, or other areas of development that are not directly related to the proposed waterline installation. For this reason, the following discussion addresses only those land use and other policies that relate most directly to the waterline installation.

2.1 Land Use

As discussed in this section, the SWSP II waterline is consistent with the goals and policies of the Larimer County Master Plan. Relevant principles and strategies from the master plan are discussed below.

Maps 5-7 depict the selected corridor's location, existing land use, and proposed development. As shown in Figure 5, the pipeline will be buried. The character of an area will not be affected by a buried waterline. Construction methods will segregate topsoil from bedding and subsoil to improve the chances of restoration success. Areas disturbed during installation will be revegetated with appropriate species, and the waterline will have very limited facilities (air release valves, blow off valves, waterline markers, etc.) that are visible at the surface. These facilities are typically located in close proximity to road crossings. All structures, such as air releases and blow off valves, will be located below grade and accessed through a ground level manhole.

Figure 5. Typical pipeline cross-section.



As previously described, the SWSP II alignment will primarily parallel the existing SWSP easement for the majority of the route. The northern portion of the project in Larimer County will be located almost exclusively within the existing SWSP easement, thus minimizing impacts to property owners. One portion of the alignment is proposed outside of the existing easement in Larimer County due to the proximity of a residential structure to the existing pipeline on the north side of LCR 8E, as well as known slope stability problems just south of LCR 8E. The selected pipeline alignment will cross through 18 parcels. Table 3 lists the specific private properties crossed by the selected pipeline alignment (also listed in Appendix A).

Table 3. Properties crossed by the selected pipeline alignment (North to South).

Parcel Number	Notes
0414000929	Little Thompson Water District and Central Weld County Water District
0414000027	Agricultural land with residence and barns
0414005702	Agricultural land with residence and barns
0414107701	Vacant
0414106701	Residence; selected pipeline alignment will diverge from existing SWSP alignment due to proximity of residence
0413000003	Residence
0414000017	Vacant agricultural land
0413000009	Vacant agricultural land
0413000012	Vacant agricultural land
0424000013	Residence
0424000002	Agricultural land with residence and barns
0424000020	Agricultural land with residence
0424000011	Agricultural land with residence and barns
0424000018	Agricultural land with residence and barns
0424000001	Agricultural land with residence and barns
0425000002	Vacant agricultural land
0436000070	Agricultural land with residence
0436000044	Vacant agricultural land

The portions of the selected pipeline alignment that parallel the existing SWSP pipeline are anticipated to be constructed within the existing permanent easement, requiring no new permanent easement acquisition. The existing permanent easement ranges between 80 to 90 feet in width and should provide adequate space to construct a parallel pipeline. The portions of the selected alignment that diverge from the existing SWSP pipeline alignment will require the acquisition of new permanent easement

approximately 80 feet in width. An additional 20 feet of temporary construction easement will be obtained along the entire alignment, where possible, to help speed the pace of construction.

Activities that will occur within the easement during construction include:

- Safe excavation of the pipeline trench (dependent upon soil types and conditions)
- Stockpiling and maintenance of topsoil (strippings)
- Stockpiling of excavated material (spoil)
- Delivery and stockpiling of pipe bedding material
- Delivery and layout (stringing) of pipe
- Delivery of pipeline appurtenances, concrete, other construction materials
- Execution of dewatering activities, welding, appurtenance construction
- Movement of construction equipment alongside excavation, backfill operations

As the project is further refined during final design, construction widths may be narrowed for short distances to reduce impacts to environmentally sensitive areas (particularly stream or creek crossings), existing residences or surface improvements, or other constraints. Construction widths may also be narrowed for longer distances if they are immediately adjacent to other usable, existing rights-of-way. Narrowing the construction corridor to 50 feet is a significant constraint for pipeline installation and cannot be efficiently maintained for long lengths.

Property owners will be able to place landscaping within the waterline easement and make other uses of the easement, with the exception of constructing permanent buildings or structures or planting trees. Within Larimer County, the selected pipeline alternative crosses only two public roads – LCR 8E and LCR 4.

2.1.1 Planned Projects

Planned projects in the vicinity of the SWSP II include the Parrish Ranch Estates. This is a conservation oriented development proposal located south of West County Road 4, just north of the Boulder County line. The development proposal would subdivide 545 acres to create 47 single family residential lots and 9 residual lots, and create 395 acres of residual open space. Within the study area, the selected pipeline alignment does not cross this proposed development.

2.1.2 Land Use Code

LU-3 New urban development within unincorporated Larimer County will be designed to be consistent with and to support adopted community plans.

> **LU-3-s1** Within the limits of existing County land use regulations, all new development in Growth Management Areas will be compatible with the municipality's adopted land use or policy plan. The County will rely on review

comments from the municipality to help determine if requests for zoning or other development approvals are consistent with the intent of the community plan.

This segment of the SWSP waterline (in Larimer County) is located wholly within unincorporated portions of the county. There are no associated Growth Management Areas (GMA) or individually adopted community plans that apply to this area of the county. Therefore, there is no conflict with currently adopted plans.

LU-10 All new development shall be located and designed for compatibility with sensitive natural areas.

LU-10-s1 The Land Use Code shall include the provision that mapping of natural hazard areas, wetlands, ridgelines and other natural and cultural resource information available from the Planning Division, be included on initial development submittals and considered in development design. Additional resource information that becomes available through the development review process should be incorporated in the design.

As discussed in detail in subsequent policies, mapping and GIS data available through the Larimer County Planning Division has been used in planning the SWSP II project, as depicted in Maps 5-7. Review of this information will be reflected in the development of mitigation measures for wetlands.

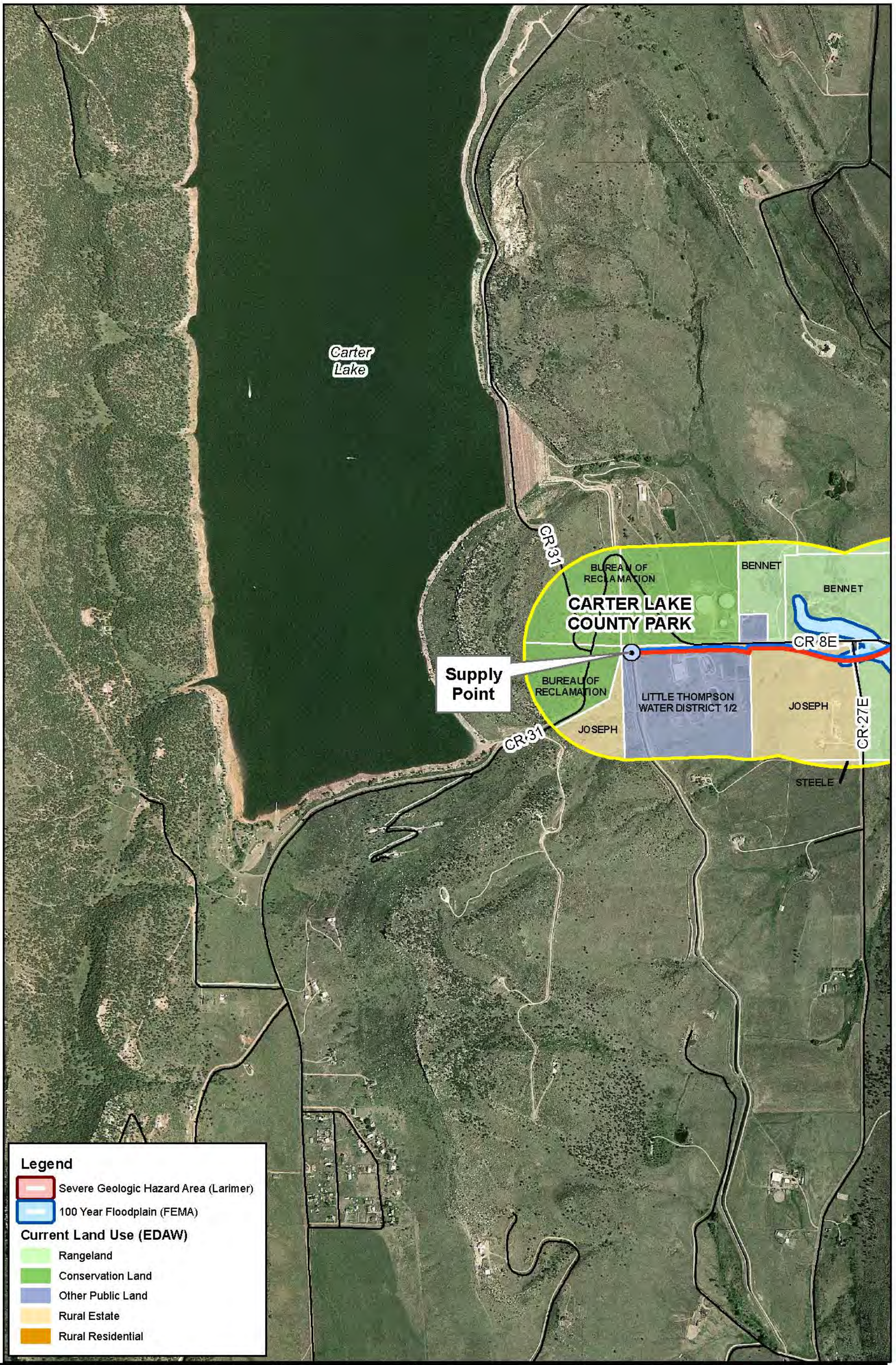
LU-10-s3 The Land Use Code shall establish standards to control erosion and prevent infestation of noxious weeds during construction of new development.

Noxious weeds identified by Larimer County are listed in Table 4.

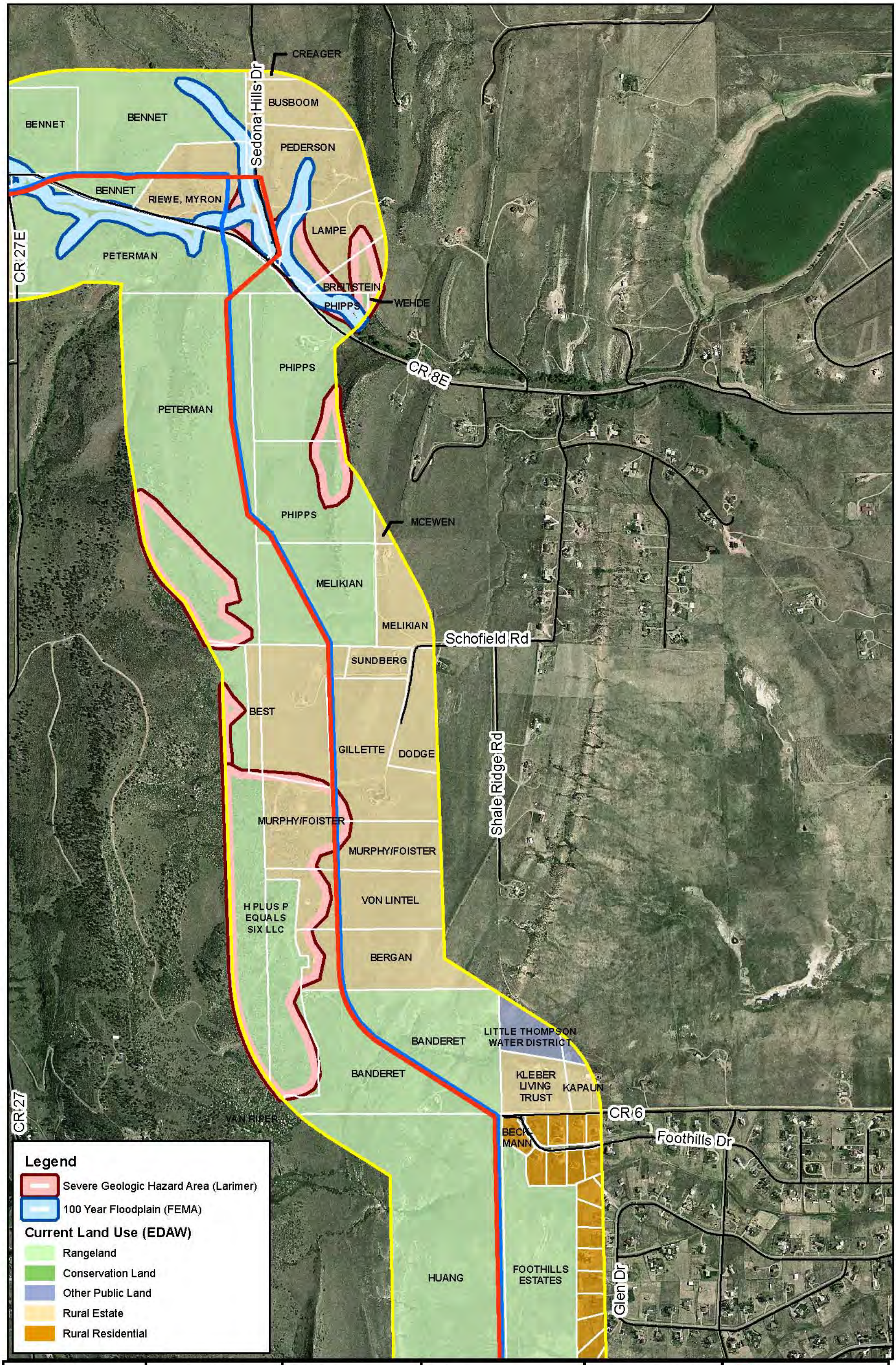
Table 4. Noxious weeds regulated by Larimer County and weeds on the County Watch List.

Common Name	*Scientific Name*
Bull thistle	*(Cirsium vulgare)*
Canada Thistle	*(Cirsium arvense)*
Common teasel	*(Dipsacus fullonum)*
Dalmatian Toadflax	*(Linaria genistifolia)*
Diffuse Knapweed	*(Centaurea diffusa)*
Houndstongue	*(Cynoglossum officinale)*
Leafy Spurge	*(Euphorbia esula)*
Musk Thistle	*(Carduus nutans)*
Russian Knapweed	*(Acroptilon repens)*
Scotch Thistle	*(Onopordum acanthium)*
Spotted Knapweed	*(Centaurea maculosa)*
Tamarisk or Saltcedar	*(Tamarix ramosissima)*

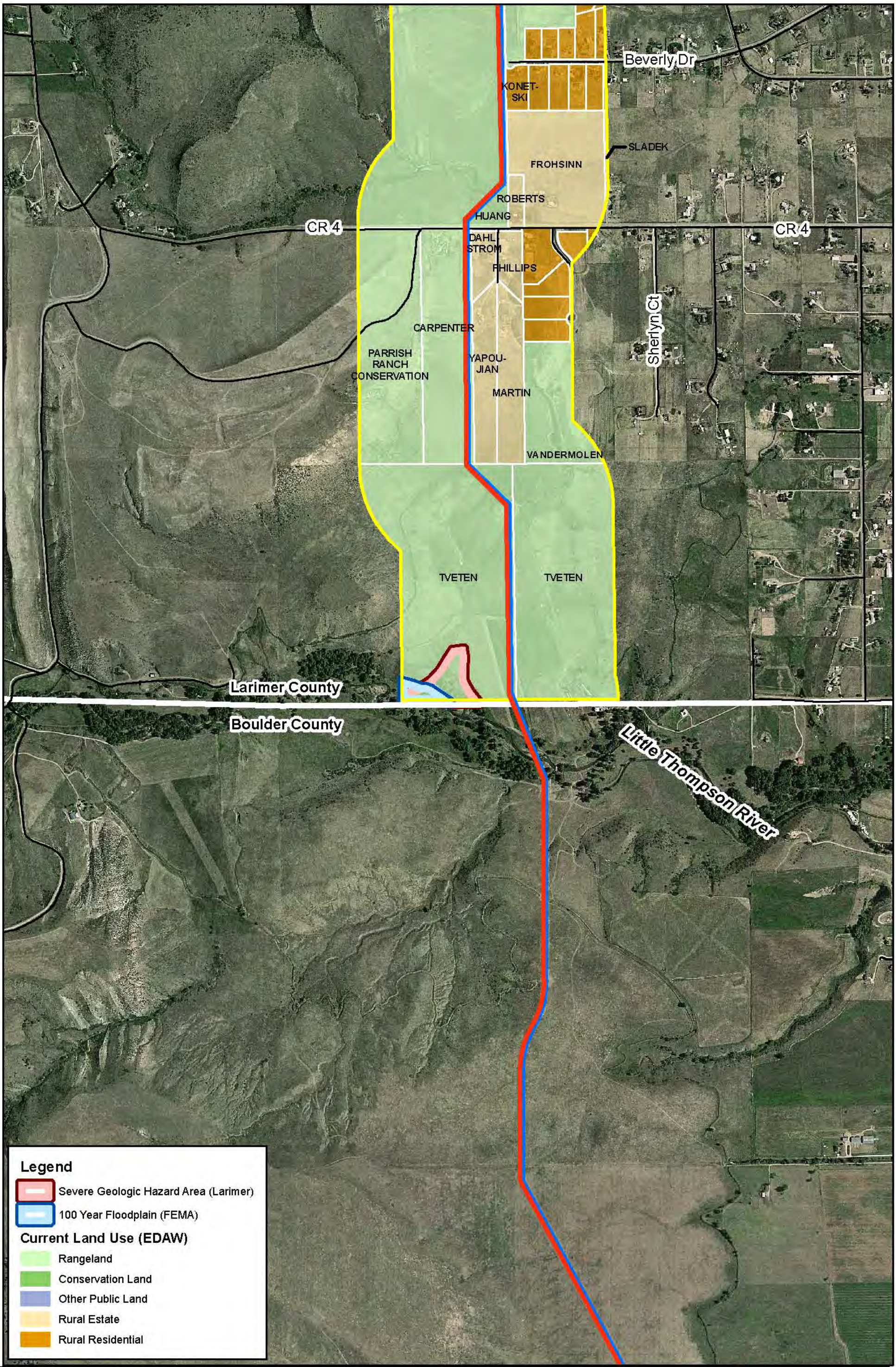
Common Name	*Scientific Name*
Yellow Toadflax	*(Linaria vulgaris)*
Larimer County's "To Watch" List (Troublesome Weeds of Larimer County)	
Blue mustard	*(Chorispora tenella)*
Cheatgrass -Downy brome	*(Bromus tectorum),*
Japanese brome	*(Bromus japonicus*
Common mullein	*(Verbascum thapsus)*
Field bindweed	*(Convolvulus arvensis)*
Flixweed	*(Descurainia sophia)*
Hoary alyssum	*(Berteroa incana)*
Hoary cress	*(Cardaria draba)*
Kochia	*(Kochia scoparia)*
Mustards	*(Brassica family)*
Perennial pepperweed or tall whitetop	*(Lepidium latifolium)*
Russian olive	*(Elaeagnus angustifolia)*
Tumble mustard	*(Sisymbrium altissimum)*
Yellow alyssum	*(Alyssum alyssoides)*



Map Number & Title:	Project Title & Applicant:	Consultant:	Engineer:	Preparation Date: 3/17/08	Selected Pipeline Alignment Existing SWSP Pipeline Study Area (1500 Ft Buffer)
Map: 5 **Land Use & Ownership**	Southern Water Supply Project II NCWCD 220 Water Ave. Berthoud, CO 80513 (970) 532-7700	EDAW|AECOM 240 East Mountain Ave. Fort Collins, CO 80524 (970) 484-6073	Integra Engineering 1095 South Monaco Parkway Denver, Colorado 80224 (303) 825-1802	Revision Date 1: Revision Date 2: Revision Date 3:	0 250 500 1,000 Feet 1:12,000



Map Number & Title:	Project Title & Applicant:	Consultant:	Engineer:	Preparation Date: 3/17/08	Selected Pipeline Alignment Existing SWSP Pipeline Study Area (1500 Ft Buffer)
Map: 6 **Land Use & Ownership**	Southern Water Supply Project II NCWCD 220 Water Ave. Berthoud, CO 80513 (970) 532-7700	EDAW|AECOM 240 East Mountain Ave. Fort Collins, CO 80524 (970) 484-6073	Integra Engineering 1095 South Monaco Parkway Denver, Colorado 80224 (303) 825-1802	Revision Date 1: Revision Date 2: Revision Date 3:	0 250 500 1,000 Feet 1:12,000



Map Number & Title:	Project Title & Applicant:	Consultant:	Engineer:	Preparation Date: 3/14/08	Selected Pipeline Alignment Existing SWSP Pipeline Study Area (1500 Ft Buffer)
Map: 7 **Land Use & Ownership**	Southern Water Supply Project II NCWCD 220 Water Ave. Berthoud, CO 80513 (970) 532-7700	EDAW|AECOM 240 East Mountain Ave. Fort Collins, CO 80524 (970) 484-6073	Integra Engineering 1095 South Monaco Parkway Denver, Colorado 80224 (303) 825-1802	Revision Date 1: Revision Date 2: Revision Date 3:	0 250 500 1,000 Feet 1:12,000

Best management practices are included in the SWSP II project specifications, and will be implemented as part of the SWSP II project to continue to minimize the potential for introduction of weeds into the project area.

LU-11 Compatibility with adjacent land use shall be considered in the design of all new development.

> **LU-11-s4** Landscaping plans shall be required as part of all major development applications and all multi-family, commercial and industrial building permits. Existing vegetation shall be maintained wherever possible, except wildfire hazard areas where thinning to achieve defensible space is necessary. Native plants, existing drainage patterns and natural designs should be used to increase the sustainability of the landscaping.

The SWSP II project has been designed to minimize disturbance by confining earth moving equipment and disturbance to the smallest area possible. Disturbed areas will be revegetated with native species and habitat improvements implemented.

Maps 5-7 depict the location of the selected corridor, existing land use, and proposed development. As shown in the previous cross-section, the waterline will be located below ground. As mentioned previously, the character of an area will not be affected by the project. Disturbed areas will be revegetated with appropriate species, and the project itself will have very limited facilities (waterline markers, etc.) that are visible at the surface, similar to the original SWSP pipeline that currently exists in the easement.

As previously described, the selected corridor is primarily located within the existing SWSP easement, thus minimizing impacts to property owners. No buildings will need to be removed along the selected corridor. Property owners would be able to place landscaping within this easement and make other uses of the easement, except the construction of permanent buildings or structures or the planting of trees.

2.2 Environmental Resources and Hazards

ER-1 Resources and environmental conditions potentially impacted by proposed development shall be identified in the initial stages of the project, to best design a development that protects the environment.

> **ER-1-s1** An environmental review shall be a formal required process beginning at the concept stage of all new development projects. Applicants will submit a checklist indicating which environmental resources and conditions will have significant, mitigatable, or no significant impact. In addition, resource information available from the Planning Department, pertaining to the project site and the area at least 1,200 feet beyond project boundaries, shall be included on the concept plan submitted with the application.

The environmental checklist, presented in Table 5, summarizes anticipated impacts to resources along the selected corridor. Additional information is provided on Maps 8-10.

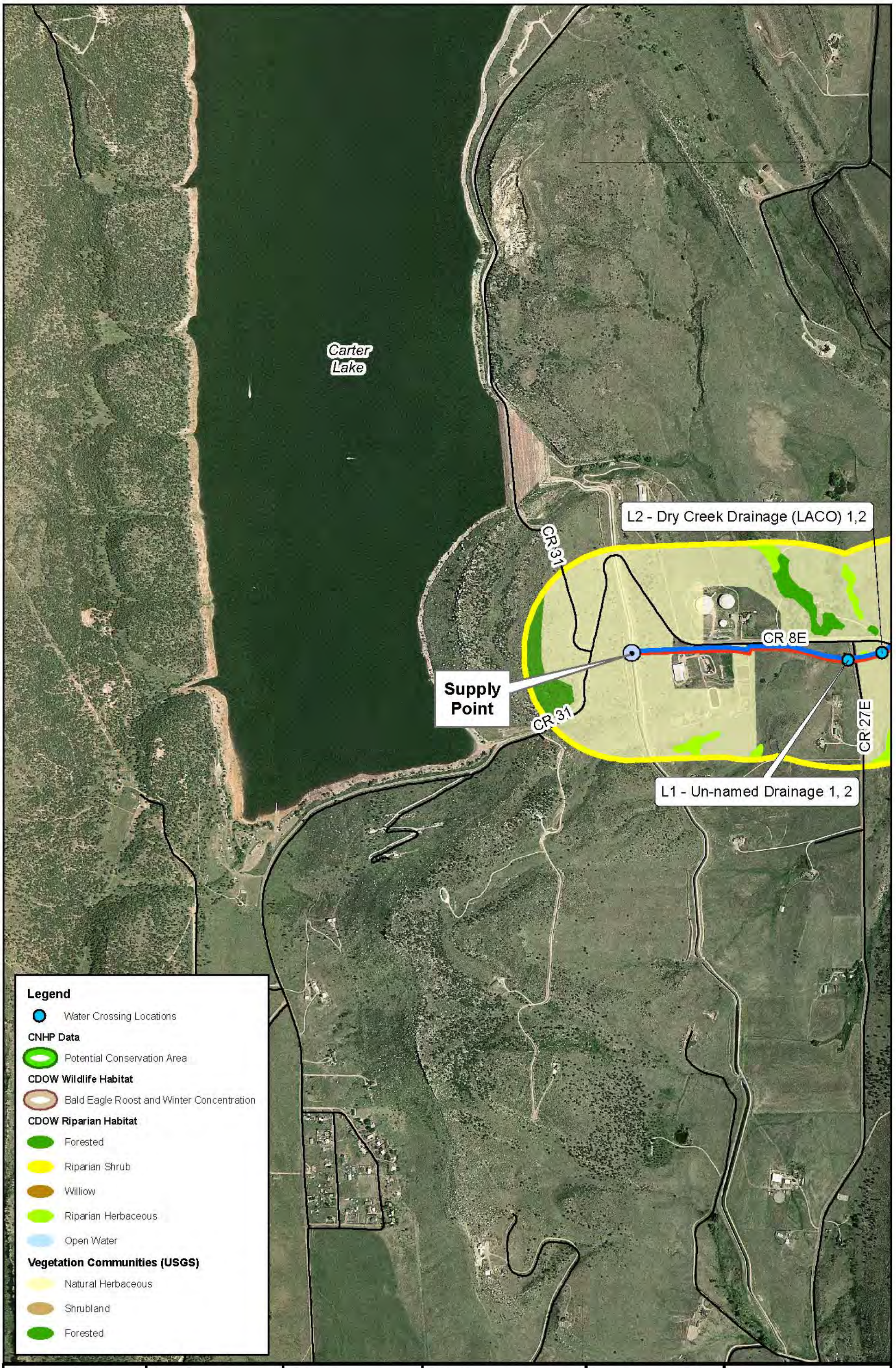
Table 5. Environmental checklist for resources identified within 1,500 feet of the pipeline alignment

Resources	Impact S = significant M = mitigatable N = no impact
100-Year Floodplains	N
Geologic Hazards and Topography	M
Wildfire Hazards	N
Cultural Resources and Geologic Features	N
Wetlands	M
Important Wildlife Habitat and Corridors	M
Rare and Endangered Plants and Animals (Colorado Natural Heritage Program Inventory)	N
Commercial Mineral Resources	N

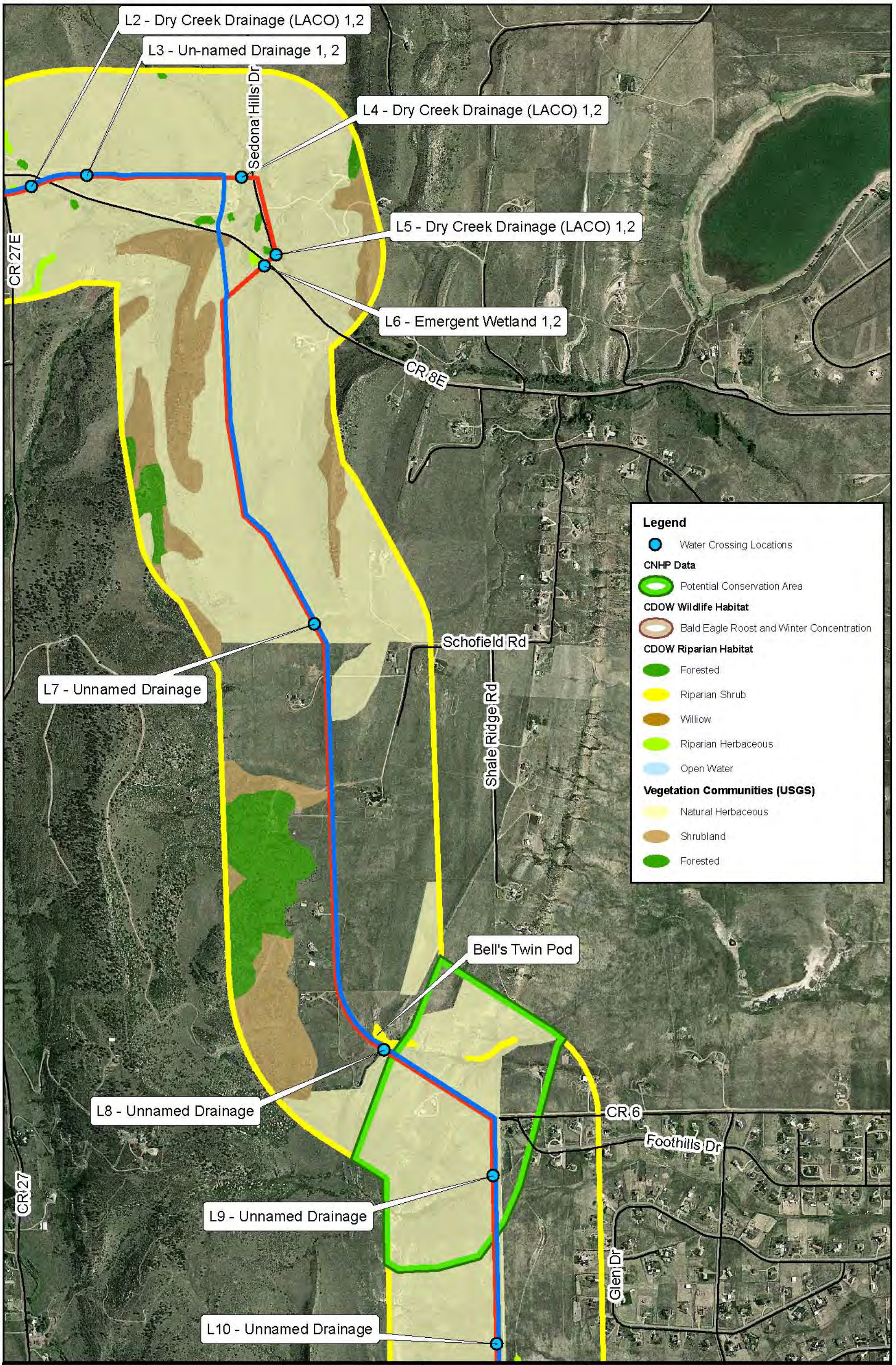
On-site reconnaissance was performed, as well as reviews of the environmental mapping provided by Larimer County, to identify impacts to vegetation, wetlands, wildlife, and cultural resources. The results of these surveys and other analyses are summarized in Table 6.

Table 6. Summary of impacts during construction of the SWSP II

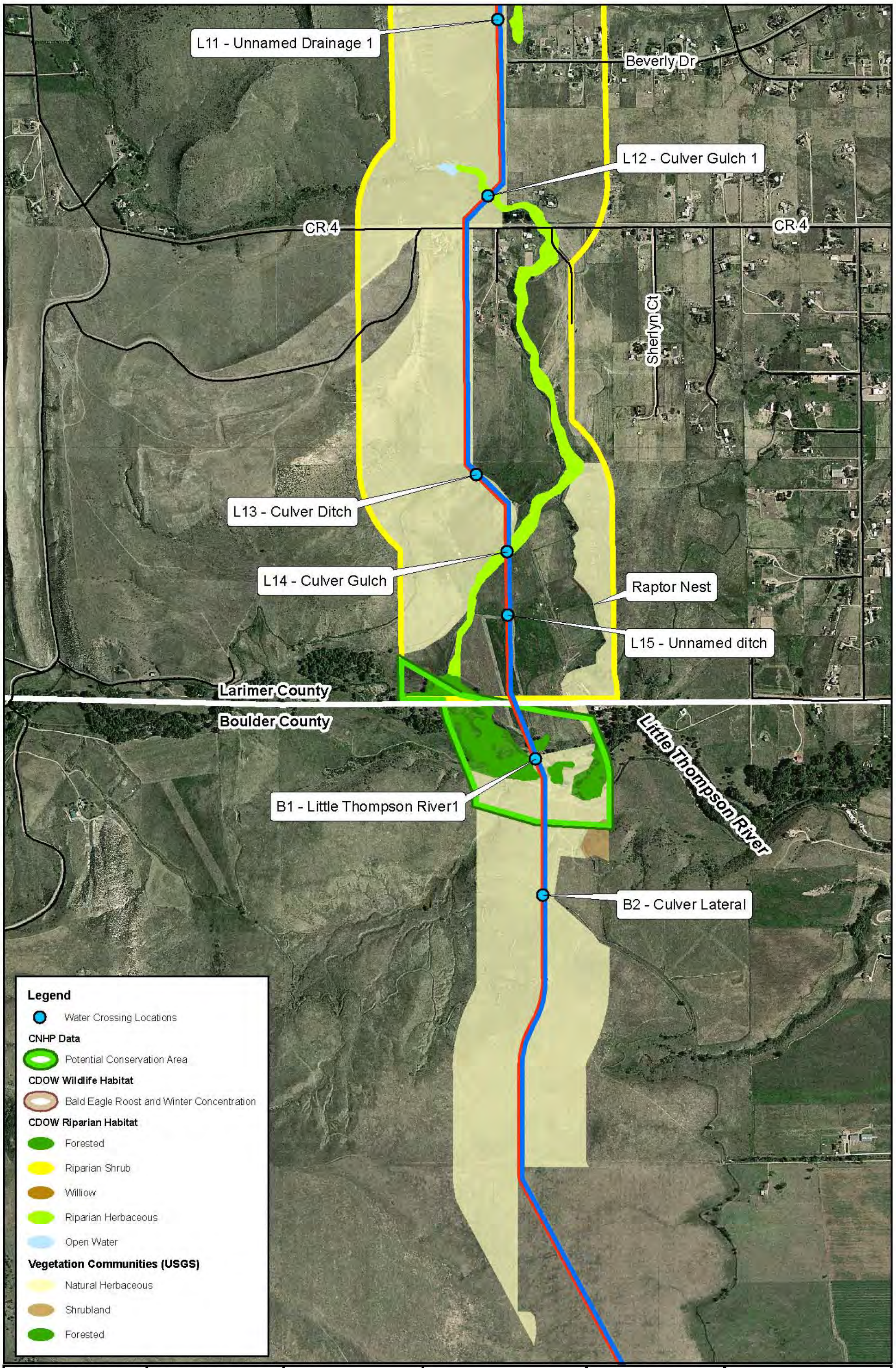
Land Use	Temporary disturbance along easements and rights-of-way.
Socioeconomics	No effect.
Hydrology	Crossing of irrigation canals and ditches. Construction is scheduled to occur during the fall and winter, during periods of typical low or no flow.
Water Quality	No effect.
Vegetation and Wetlands	Temporary impacts to upland vegetation and wetlands. Areas will be restored to original condition. Wetlands are only located at minor ditch and canal crossings.
Wildlife	Temporary effect only during and immediately following construction.
Fisheries	No effect.
T & E Species	No effect.
Recreation	No effect.
Cultural Resources	No effect.



Map Number & Title:	Project Title & Applicant:	Consultant:	Engineer:	Preparation Date: 3/17/08	Selected Pipeline Alignment Existing SWSP Pipeline Study Area (1500Ft Buffer)
Map: 8 **Environmental Resources**	Southern Water Supply Project II NCWCD 220 Water Ave. Berthoud, CO 80513 (970) 532-7700	EDAW|AECOM 240 East Mountain Ave. Fort Collins, CO 80524 (970) 484-6073	Integra Engineering 1095 South Monaco Parkway Denver, Colorado 80224 (303) 825-1802	Revision Date 1: Revision Date 2: Revision Date 3:	0 200 400 800 Feet 1:12,000



Map Number & Title:	Project Title & Applicant:	Consultant:	Engineer:	Preparation Date: 3/17/08	Selected Pipeline Alignment Existing SWSP Pipeline Study Area (1500Ft Buffer)
Map: 9 **Environmental Resources**	Southern Water Supply Project II NCWCD 220 Water Ave. Berthoud, CO 80513 (970) 532-7700	EDAW|AECOM 240 East Mountain Ave. Fort Collins, CO 80524 (970) 484-6073	Integra Engineering 1095 South Monaco Parkway Denver, Colorado 80224 (303) 825-1802	Revision Date 1: Revision Date 2: Revision Date 3:	0 200 400 800 Feet 1:12,000



Map Number & Title:	Project Title & Applicant:	Consultant:	Engineer:	Preparation Date: 3/17/08
Map: 10 **Environmental Resources**	Southern Water Supply Project II NCWCD 220 Water Ave. Berthoud, CO 80513 (970) 532-7700	EDAW|AECOM 240 East Mountain Ave. Fort Collins, CO 80524 (970) 484-6073	Integra Engineering 1095 South Monaco Parkway Denver, Colorado 80224 (303) 825-1802	Revision Date 1: Revision Date 2: Revision Date 3:

Selected Pipeline Alignment
Existing SWSP Pipeline
Study Area (1500Ft Buffer)

0 200 400 800 Feet

1:12,000

Important biological resources with the potential to be affected by the construction, operation, and maintenance of a pipeline are distributed throughout the project area, but are primarily along Dry Creek and the Little Thompson River. They also occur to a lesser extent along the other minor drainages.

ER-2 Monitoring of environmental conditions is a critical part of the environmental protection strategy.

> **ER-2-s2** Monitoring during the development process is necessary to ensure compliance with performance standards. The Planning Department will incorporate this function into its proposed work plan and budget. Adequate staffing will benefit both the developer and citizenry by providing a level playing field and consistency of monitoring and enforcement.

Northern Water will monitor environmental compliance by its contractors and will specify that environmental commitments be carried out. In addition, Northern Water will monitor the restoration of the disturbed area to ensure the easement is restored to preconstruction conditions.

2.2.1 Wetlands

Wetlands in Larimer County were mapped using the county's GIS data and reviewed in the field. Wetland features were identified and characterized in the field. Most major streams in the study area are generally characterized by narrow zones of wetland vegetation in the floodplain and on sub-irrigated stream terraces. The zone of wetland vegetation has often been enlarged due to flood irrigation of low areas along streams. In several cases, these potential wetland areas have been modified by cultivation or other land use practices, and are delineated as areas of wet or hydric soils. A detailed description of the wetland impacts by the pipeline are discussed below. The Clean Water Act requires that impacts to jurisdictional wetlands and waters of the U.S. be avoided to the extent feasible, and that unavoidable impacts to wetlands be minimized and mitigated. Impacts associated with the pipeline are expected to be temporary in nature and will not have any lasting effects. The drainages crossed are linear features and impacts to wetlands cannot be avoided. Wetlands are considered to have a high constraint value for pipeline routing and have been avoided as much as possible.

ER-3 Larimer County shall endeavor to protect all identified wetland areas of the County, in recognition of their importance in maintaining water quality, wildlife habitat, flood protection and other critical environmental functions.

> **ER-3-s1** Larimer County wetlands shall be defined to include both Clean Water Act (CWA) and U.S. Fish and Wildlife Service (USFWS) wetland areas. Wetlands shall include swamps, marshes, bogs, riparian areas, salt flats, vernal pools, and farmed and other disturbed wetland areas, as more specifically described in the Proposed Wetland Classification and Protection Program, March 1996, prepared

by David J. Cooper, Ph.D. and David M. Merritt, M.S.

ER-3-s2 The Wetland Map, adopted by reference as part of the Master Plan, shall be the basis for the initial Environmental Review process, which is required for all new development projects. County staff and the landowner will work together on a case-by-case basis to identify and prioritize those other wetlands that do not appear on the Wetland Map due to scale and size limitations, and in areas not yet inventoried.

ER-3-S3 A Wetland Mitigation Plan shall be developed for any development project which impacts a wetland. Requirements and performance standards for the mitigation plan shall be clearly established in the Land Use Code, and shall be the basis for approval of that plan.

Larimer County GIS data was consulted to identify wetlands and other natural resources. Detailed field investigations were used to identify additional natural resources. As depicted in Maps 8-10, the corridor of the SWSP II project is located in close proximity to, or will cross several natural features. As part of the corridor selection process, natural features were identified and were avoided where possible. However, in a limited number of instances (e.g., a linear feature such as an irrigation ditch), complete avoidance of these features was not possible.

2.2.2 Federally Listed Threatened and Endangered (T&E) Species

The Preble's meadow jumping mouse (PMJM) (*Zapus hudsonius preblei*), and Ute ladies'-tresses orchid (*Spiranthes diluvialis*) are federally listed as threatened and are known to occur within the study area. Selected pipeline route alternatives avoided known T&E habitat to the greatest extent possible. Focused surveys were conducted, including Ute ladies'-tresses surveys, PMJM habitat assessments, and PMJM trapping. Only the Little Thompson River was considered suitable habitat by a PMJM specialist and was trapped (Map 10). No Ute ladies'-tresses or PMJM were found.

2.2.3 Rare Plants and Natural Community Areas

The identity and location of rare plants and significant natural communities in the study area have been mapped by the Colorado Natural Heritage Program and previous SWSP studies. Rare plants reported in the area include spleenwort (*Asplenium adiantum nigrum*), forktip three-awn (*Aristida basiramea*), American groundnut (*Apios americana*), Ute ladies'-tresses orchid, and Bell's twinpod (*Physaria bellii*). Bell's twinpod is considered a state imperiled species, while the Ute ladies' tresses orchid is considered state imperiled as well as federally listed as threatened. The first four species were not encountered during the surveys conducted for the original SWSP. Focused surveys were performed for Bell's twinpod and Ute ladies' tresses, but were not found within the proposed alignments. A population of Bell's twinpod was found east of the preliminary pipeline alignment and is protected by a drainage that will not be impacted by the project (Map 9). No other rare or sensitive species were found.

Significant natural communities and ecosystems identified by the CNHP include mixed foothill shrublands, foothills shrub, foothills ponderosa pine scrub woodlands, and Great Plains mixed grass prairie. These natural communities are considered either state imperiled or state vulnerable and they have been avoided where possible.

2.2.4 Wildlife Concentration Area

CDOW identifies the Little Thompson River corridor as a Wildlife Concentration Area for white-tailed deer and bald eagle. CNHP designates the Little Thompson River as an area with a moderate biodiversity rating (Map 10). Although the Little Thompson River is located within Boulder County at the pipeline crossing, it is close enough that a portion of the designated concentration areas fall within Larimer County.

ER-4 Larimer County shall endeavor to protect all areas identified as highest priority on the Important Wildlife Habitat Map, which is adopted by reference as part of the Master Plan.

> **ER-4-s2** The adopted Important Wildlife Habitat Map, available in the Planning Department, shall be the basis for the initial Environmental Review process, required for all new development projects.
>
> **ER-4-s3** A Wildlife Impact Mitigation Plan shall be developed for any development project which impacts an Important Habitat, or which presents concerns of detrimental human-wildlife interaction. Requirements and performance standards for the mitigation plan shall be clearly established in the Land Use Code and shall be the basis for approval of the plan.

The “Larimer County, Colorado Environmental Map” was consulted as part of the planning process. The project should not have any significant impact to wildlife resources.

2.2.5 Geotechnical/Geological Issues

Landforms vary substantially within the study area, from hogbacks and ridges, to flat and rolling plains. As such, there are several geotechnical or geological features of concern related to pipeline routing.

ER-5 Approval of development in hazard areas shall require a finding that the proposed development is compatible with the potential hazards and that future owners or the County shall not be subject to safety hazards or economic costs associated with development related to the natural disturbance.

> **ER-5-s1** Structures for human use or occupation shall not locate in severe hazard areas. These areas shall be avoided in development plans. In Rural Conservation Development and Rural Land Use Process applications, open

space areas shall be located where severe hazard areas exist. In addition, restrictions shall be placed on activities that might increase the potential for natural disturbance.

The proposed alignment cross two severe geologic hazard areas as described in available Larimer County mapping with a geologic hazard number of "3" and hazard classification of "severe". This data contradicts the severe [geologic] hazard areas defined in the Larimer County Master Plan as geologic hazards numbers areas classified as "...5, 6, or 7 on the official Geologic Hazards Maps adopted by the Board of County Commissioners; slopes greater than 30 percent." These geologic hazards are located where the pipeline turns south near LCR 8E (Map 8) and midway to the Boulder County line (Map 9). Additional investigation was conducted at each of these sites. The bed orientation along LCR 8E does provide some instability on the downhill slope and may require flatter than usual temporary trench slopes or shoring. The risk of dip slope landsliding is minimal. The second geologic hazard is a debris slide crossed during the construction of the original SWSP with little difficulty, and no issues are expected. These geologic hazards have been considered and will be mitigated for in the final design.

ER-5-s2 Moderate hazard areas shall be avoided wherever possible or the potential disturbance adequately mitigated. The Land Use Code shall establish guidelines for mitigation plans and require that the plans be reviewed by professionals having demonstrated expertise in the appropriate field, i.e., geology or wildfire management.

ER-5-s3 Potential disturbances shall be eliminated in constraint areas as part of the development design process. Approval of development in constraint areas shall be conditional, based on adequate mitigation of the potential natural disturbance. Strategies for follow-up monitoring to ensure that mitigation has occurred shall be incorporated when appropriate.

The remainder of the pipeline alignment falls primarily within the low geologic hazard area category, with a very small portion falling within the moderate class. Additionally, the pipeline alignment lies along slopes of less than 10% slope.

2.2.6 Drainages

There are 15 drainages crossed by the corridor, including Dry Creek (three times), two forks of Culver Gulch, and 10 unnamed drainages. A description of these crossings is listed in Table 7. Dry Creek and a number of unnamed tributaries are located at the northern end of the pipeline, and Culver Gulch is located towards the Boulder County line. Dry Creek is dominated by water cress (*Nasturtium officinales*), sedge (*Carex* sp.), meadow fescue (*Festuca pratensis*), and Canada wildrye (*Elymus canadensis*). Most of the unnamed drainages are generally ephemeral or intermittent in nature, and are dominated by upland species such as smooth brome (*Bromus inermis*) or cheatgrass (*Bromus tectorum*). The Culver Gulch crossings are dominated by common

threesquare (*Schoenoplectus pungens*), meadow fescue, broadleaf cattail (*Typha latifolia*), jointleaf rush (*Juncus articulatus*) Nebraska sedge (*Carex nebrascensis*), and Russian olive (*Elaeagnus angustifolia*). All of these drainages provide valuable habitat for wildlife and are considered to be waters of the U.S., regulated by Section 404 of the Clean Water Act. Crossing of these jurisdictional drainages will be permitted under nationwide permit (NWP) 12, specifically for utility line activities. All temporary impacts to jurisdictional waters of the U.S. will be restored to mitigate for any effects.

Table 7. Location of Drainage Crossings for SWSP II

Description	Crossing Feature No.	Legal Description	Dominant Species (% cover)	Cover (%)	Comments	Anticipated Crossing Method
Unnamed drainage 1,2	L1	NW¼, Section 14, T4N, R70W Larimer County	Bromus inermis FACU* Bromus tectorum Centaurea diffusa Chrysothamnus nauseosus Pinus ponderosa FACU- Verbascum Thapsus NI	5 25 T 10 5 5	No evidence of recent flowing water. No wetland vegetation. Drainage channel present.	Trenched
Dry Creek (LACO) 1,2	L2	NE¼, Section 14, T4N, R70W Larimer County	Acer negundo FAC Agrostis stolonifera FACW Nasturtium officinale Festuca pratensis FAC Glycyrrhiza lepidota FACU Cirsium arvense FACU Elaeagnus angustifolia FAC Schoenoplectus lacustris subsp. creber OBL Scirpus paludosus OBL	T 10 50 30 T 5 T 5 10	Riparian area 12 feet wide.	Trenched
Unnamed drainage 1,2	L3	NE¼, Section 14, T4N, R70W Larimer County	Bromus inermis FACU* Rhus aromatica subsp. trilobata UPL	50 5	No wetland vegetation. Drainage channel present.	Trenched
Dry Creek (LACO) 1,2	L4	NE¼, Section 14, T4N, R70W Larimer County	Schoenoplectus lacustris subsp. creber OBL Carex sp.	25 50	Water flowing < 1cfs. Riparian area 8 feet wide.	Trenched
Dry Creek (LACO) 1,2	L5	NE¼, Section 14, T4N, R70W Larimer County	Festuca pratensis FAC Populus deltoids subsp monilifera FAC Pinus ponderosa FAU- Solidago canadensis FACU Amorpha fruticosa OBL Elymus canadensis FACU Equisetum arvense FAC Salix amygdaloides FACW Prunus virginiana FACU Chrysothamnus nauseosus	50 5 T 10 5 5 10 5 5 5	Water flowing 2 cfs. Riparian area 30 feet wide. Left bank very steep.	Trenched
Emergent wetland 1,2	L6	NE¼, Section 14, T4N, R70W Larimer County	Typha latifolia OBL Salix exigua OBL Salix amygdaloides FACW	50 10 10	Wetland 20 feet from access road.	Trenched
Unnamed drainage	L7	SW¼, Section 13, T4N, R70W Larimer County	Adenolinum lewisii Astragalus sp. Taraxacum offinale Agropyron smithii Poa pratensis FACU	5 5 5 10 10	No wetland vegetation. No evidence of flowing water.	Trenched
Unnamed drainage	L8	SW¼, Section24, T4N, R70W Larimer County	Poa pratensis FACU Agropyron smithii Rhus aromatica subsp. trilobata UPL	10 10 10	No wetland vegetation.	Trenched

Description	Crossing Feature No.	Legal Description	Dominant Species (% cover)	Cover (%)	Comments	Anticipated Crossing Method
Unnamed drainage	L9	NW¼, Section 25, T4N, R70W Larimer County	Bromus inermis FACU* Bouteloua curtipendula Heterotheca villosa FACU* Chrysothamnus nauseosus	25 5 5 5	No wetland vegetation. Drainage channel present.	Trenched
Unnamed drainage	L10	NW¼, Section25, T4N, R70W Larimer County	Bromus inermis FACU* Heterotheca villosa FACU* Chrysothamnus nauseosus	25 5 5	No wetland vegetation. No defined channel.	Trenched
Unnamed drainage 1	L11	SW¼, Section 25, T4N, R70W Larimer County	Bromus inermis FACU* Agropyron smithii	25 25	No defined channel.	Trenched
Culver Gulch 1	L12	SW¼, Section 25, T4N, R70W Larimer County	Typha latifolia OBL Schoenoplectus pungens OBL Elaeagnus angustifolia FAC Carex nebrascensis OBL Juncus articulatus NI Agrostis stolonifera FACW Amorpha fruticosa OBL Glycyrrhiza lepidota FACU Cirsium arvense FACU Rumex crispus FACW Festuca pratensis FAC	10 50 T 10 5 10 5 T T T 10	Riparian area 120 feet wide. Water flowing 1 cfs.	Trenched
Culver Ditch	L13	SW¼, Section 36, T4N, R70W Larimer County	Carex emoryi OBL Rosa woodsii FACU Salix exigua OBL	20 T 60	Active irrigation ditch. 15 feet wide. *Centaurea diffusa* present in area.	Trenched
Culver Gulch	L14	SE¼, Section 36, T4N, R70W Larimer County	Festuca pratensis FAC Distichlis stricta FACW Carex nebrascensis OBL Glycyrrhiza lepidota FACU	80 5 10 5	Small locals wetland areas. Intermittent channel.	Trenched
Unnamed ditch	L15	SE¼, Section 36, T4N, R70W Larimer County	Carex nebrascensis OBL Festuca pratensis FAC	30 60	Narrow field ditch. Riparian area 3 feet wide.	Trenched

2.2.7 Irrigation Ditches

The SWSP II project crosses Culver Ditch, which is dominated by coyote willow (*Salix exigua*), Wood's rose (*Rosa woodsii*), and Emory's sedge (*Carex emoryi*). This irrigation ditch is not likely considered jurisdictional; however, the U.S Army Corps of Engineers (Corps) will make the final determination on jurisdictional status. If the ditch is found to be jurisdictional, a 404 permit under nationwide permit NWP 12 and necessary mitigation will be required.

Although the irrigation ditches generally have marginal or degraded native vegetation, they provide valuable corridors for wildlife. These corridors are particularly valuable since they provide relatively safe travel through rural and urban areas, especially in areas with roadways. It is common to find animal trails and beaten down vegetation resulting from travel and bedding. Irrigation ditches are also important for waterfowl (such as dabbling ducks), for foraging, nesting, and fledging areas. Some reaches of irrigation ditches often remain open, even during the winter months, providing refuge for a variety of water-related species.

Mitigation of irrigation ditches typically consists of restoring the ditch bottom and banks back to the original elevation and slope contours. The banks will be seeded with appropriate native seed mix to improve the existing generally degraded habitat. In order to avoid disruption with the region's water delivery system, crossing through irrigation ditches will likely occur in the winter months during periods of little to no flow.

2.2.8 Floodplains

There are three crossings of floodplains, all associated with the Dry Creek drainage in the northern portion of the study area or the Little Thompson River at the Boulder County border (Maps 8-10).

2.2.9 Trees and Riparian Woodlands

The presence of trees along the pipeline alignments are an important resource. Trees within or in close proximity to road rights-of-way provide refuge for wildlife and visual screening for adjacent property owners. Native trees are primarily limited to existing or historic watercourses, ponds, or lakes. This type of riparian vegetation provides a significant visual amenity and habitat sanctuary. Contiguous riparian woodlands provide valuable wildlife movement corridors and help to maintain connectivity. Mature native cottonwood trees are the selected perches for hunting raptors. Single large trees (typically plains cottonwood, *Populus deltoids*) are important for a variety of species of birds, particularly raptors, for perching and nesting. Trees, and especially forests, create buffers that provide a sense of separation from adjacent land uses.

In most areas, the SWSP II project will avoid forested areas. However, the corridor does intersect several areas where single large trees or forested areas are present. These areas are associated with the Little Thompson River and Culver Gulch Ditch (Maps 9 and 10). Trees and forested areas are typically associated with wetland and irrigation ditches. Native tree species that are found along the alignment are plains cottonwood, narrow leaf cottonwood, peachleaf willow, as well as nonnative species such as Russian olive. Pipeline routes that traverse densely forested lands, particularly those associated with stream corridors and designated Critical Wildlife Habitats, are considered to have a high impact. Avoidance of trees, in particular larger native trees, was an important consideration in the route selection process, and it is anticipated that no larger trees will have to be removed. Mitigation measures for areas where less significant trees are present, including avoidance, will be determined when the exact location of the waterline is known. For areas where trees will be impacted, the appropriate Larimer County departments will be contacted; specific impacts will be discussed and appropriate mitigation measures, such as replacement, will be implemented.

2.2.10 Raptor Nests

Information related to raptor nests was obtained from the Colorado Division of Wildlife (CDOW) database and from field observations. Nests identified in the CDOW database contained attributes related to species observations, whether the nest is active, and whether the nest still exists if it is inactive. One raptor nest was identified along the Culver Gulch Ditch, approximately 800 feet east of the selected pipeline alignment (Map 10). Activity levels or associated species have not yet been identified. Additional information related to any potentially affected nest sites will be obtained during the active nesting/fledging period prior to construction.

The presence of a raptor nest can indicate areas that are suitable for raptor hunting and are present in sufficient quantity and proximity to support these birds. This type of habitat is generally located in more open and undeveloped areas such as fields and pastures. As development in-fills the remaining open areas, it is likely that raptors will relocate to areas that are more suitable and their nests may eventually be abandoned.

No raptor nest will be directly impacted by installation activities, i.e., tree or nest removal. If active nests are found close to the corridor, mitigation for these nests will be accomplished through avoidance of construction activity within the buffer zone during the period of active use. The extent of the buffer zone and seasonal restrictions will be further defined through additional consultation with appropriate departments, including CDOW.

2.2.11 Prairie Dog Colonies

Prairie dogs are an important food source for raptors and other predators and can be an indicator of ecological health. No active prairie dog colonies were found in or adjacent to the proposed alignment.

2.2.12 Air Quality

ER-12 Larimer County shall use cooperative efforts, development standards and incentive programs to protect air quality.

> **ER-12-s2** All new development shall comply with local, State and Federal air quality standards. No new development expected to create particulate levels above State standards on unpaved roads shall be approved. Commercial and industrial uses shall meet all applicable permitting requirements prior to final approval of uses. See also Section 5.3, Transportation Improvements Program, regarding road paving to reduce particulate levels.

The project will not result in long-term effects on air quality.

> **ER-13-s2** Development applicants shall comply with State requirements for controlling dust emissions during the construction phase of development. The Land Use Code shall reference performance standards for dust control.

Dust emissions resulting from construction phase activities will be mitigated with appropriate dust suppression measures and will comply with all applicable air quality regulations.

2.2.13 Water Quality

ER-14 Water quality shall be protected by analyzing potential impacts of development proposals, the application of best management practices to reduce or control sources of contamination, and a demonstration of compliance with local, State and Federal requirements.

> **ER-14-s1** Applicants for new development shall address potential water quality impacts for properties that contain surface water or have the potential to impact surface or groundwater quality. A water quality management plan shall be included as part of the stormwater report in the development review process.
>
> **ER-14-s4** Applicants for construction activities, industrial uses and mining activities which meet thresholds under State law shall demonstrate that they have obtained a Colorado Stormwater Permit. Colorado Stormwater permits require applicants to identify and carry out appropriate best management practices to minimize polluted runoff from their sites.

The project specifications will require stormwater best management practices be carried out to minimize polluted runoff from disturbed areas.

2.2.14 Noise, Glare, and Odors

ER-17 Larimer County shall develop noise and glare performance standards and enforce State odor condition standards to protect the health, safety and welfare of County residents.

> **ER-17-s1** Noise standards from the County Noise Ordinance shall be used in the development review process to ensure that new development does not create unacceptable noise conditions beyond its property boundaries. The Land Use Code shall reference maximum permissible noise levels consistent with the existing County Noise Ordinance. If the County has reason to believe that a proposed use may cause noise which would be objectionable or otherwise cause a nuisance, a noise mitigation plan may be required as part of a development application.

Elevated noise levels will be limited to the construction phase and will not exceed applicable standards.

2.2.15 Cultural Resources

Cultural resources information was obtained from a file search of the State Historical Preservation Office (SHPO) and a review of known cultural resources by Native Cultural Services. The file search for the entire project alignment revealed one prehistoric resource (isolated artifact) within the study area; however, isolated artifacts are not eligible to the National Register of Historic Places (NRHP). The file search also revealed 17 historic resources, including irrigation ditches, railroads, and standing buildings; however, none of these historic resources fall within Larimer County. The significance of a cultural resource was determined by meeting specific criteria of eligibility for listing on the NRHP. Adverse effects to significant cultural properties from pipeline construction will be avoided or mitigated if encountered.

ER-18 The development review process shall assist in the protection of the special places of Larimer County.

> **ER-18-s1** Sites and structures listed on State and National Registers of Historic Places and in the Larimer County Parks Comprehensive Master Plan shall be included on the environmental checklist at the initial stages of a development project. Other landmarks of local interest shall also be included on the checklist. The development review process shall consider options for preserving and protecting these features and sites.

The corridor will not impact any Larimer County-designated landmarks. The preservation of historic resources is an important value to residents. Sites having Local Landmark status as well as sites potentially eligible for local, state, or federal status were avoided.

Archeological resources are another important cultural resource. The literature review performed by Native Cultural Services (2005) did not identify any eligible historic sites nor were any archeological resources discovered during installation of the existing SWSP. If resources are discovered during project implementation, operations in the area will be halted in accordance with SHPO guidelines.

> **ER-18-s2** Preservation of unique or distinctive natural features shall be considered in the design of the development. As with other resources, open space areas shall be used to protect and preserve the special places of the County.

The selected corridor does not affect county-owned open lands as well as other unique or distinctive natural features.

2.2.16 Public Facilities and Services

PF-1 New development shall be approved only when adequate public facilities and services are available, or when necessary improvements will be made as part of the development project.

> **PF-1-s1** Adequate facilities and service levels shall be clearly defined in the Land Use Code and shall include standards for water, sewer, fire protection, stormwater management and transportation at a minimum. In Growth Management Areas, service level standards shall be compatible with those of the adjacent municipality, as specified in an Intergovernmental Agreement with the municipality. In other areas, standards shall be based on the density and intensity of the use.
>
> **PF-1-s2** The facilities need either to be in place or to have funding commitments made prior to completion of any project, to ensure that new residents are not left without required facilities and services. For facilities that will be the responsibility of individual property owners to develop, i.e., wells and septic systems, the Land Use Code should include provisions to ensure that the facilities can actually be provided as proposed in a development application.

Consultation with public service providers in the area was conducted throughout the planning process. The selected alignment will co-locate in the existing SWSP for a majority of the alignment through Larimer County.

During the routing process, many utility service providers were contacted to identify both future and existing facilities that could be impacted. Both existing and planned water, sewer, drainage, and electric utilities have been identified based on information provided by the utility. Areas that are heavily congested with existing or planned facilities have been avoided during the development of the corridor.

The crossing of utility facilities is inevitable, but has been minimized to the greatest extent practical. Details regarding these crossings, such as separation distances and construction techniques, have not been specified at this stage, as they do not have the potential to change the corridor selection. These details will be addressed during the final design phase of the project, and will be reviewed with Larimer County staff to provide protection of existing utilities.

Co-location of the proposed SWSP II line with the existing SWSP line was a priority for this project. As such, the majority of the alignment within Larimer County is co-located within the existing easement.

PF-10 New development shall not reduce existing service below adequate levels, nor shall capital improvements to support new development be subsidized by existing residents.

> **PF-10-s1** Capital expansion fees shall be considered as a funding mechanism for facilities that receive increased demand or need for expansion as a result of new growth and development.

The waterline installation will be designed and constructed entirely through funds provided by the participants and administered by Northern Water.

Section 3. Appendices

Appendix A: Larimer County Planning Department Application Form

LARIMER COUNTY
COMMITTED TO EXCELLENCE

Larimer County Planning Department Application Form

Please note that submittal deadlines are applicable to certain types of applications. Applications submitted after 12:00 PM on submittal deadline days will not be accepted.

Type of application (check all that apply)

- ☐ Appeal
- ☐ Extended Family Dwelling
- ☐ Farmstead
- ☐ Rezoning
- ☐ Site Plan Review
- ☐ Special Exception
- ☐ Minor Special Review
- ☐ Special Review
- ☐ Variance
- ☐ Waiver
- ☐ Wireless Facility – Admin Review
- ☒ Other: Please List Location and Extent Review

This application is for:

- ☐ Sketch Plan Review
- ☐ Site Plan Review
- ☐ Staff Review
- ☒ Planning Commission
- ☐ Board of County Commissioners
- ☐ Board of Adjustment

(staff use only) Previous file number(s):

General information

Applicant No. 1

Name: Southern Water Supply Project Water Activities Enterprise
Address: 220 Water Ave.
City / State / Zip: Berthoud, CO 80513
Contact Phone: 970-532-7700 Fax: 970-532-0942
E-mail:

Contact Person

Name: Mr. Carl Brouwer
Address: 220 Water Ave.
City / State / Zip: Berthoud, CO 80513
Contact Phone: 970-532-7700 Fax: 970-532-0942
E-mail: cbrouwer@ncwcd.org

Applicant No. 2

Name:
Address:
City / State / Zip:
Contact Phone:
E-mail:

Contact Person

Name:
Address:
City / State / Zip:
Contact Phone:
E-mail:

Engineer

Agency: Integra Engineering

Contact person: Randy Parks PE
Address: 215 Union Boulevard, #500
City / State / Zip: Lakewood, CO 80228
Contact Phone: 303-825-1802 Fax: 303-825-2322
E-mail: randyp@integraeng.com

Surveyor

Agency: NA
Contact person: _____
Address: _____
City / State / Zip: _____
Contact Phone: _____ Fax: _____
E-mail: _____

☐ ***Designer***
☒ ***Planning Consultant***

Agency: EDAW, Inc.
Contact person: John Ko
Address: 240 East Mountain Avenue
City / State / Zip: Fort Collins, CO 80524
Contact Phone: 970-484-6073 Fax: 970-484-8515
E-mail: john.ko@edaw.com

Signatures (Both are required):

I hereby certify that I am the lawful owner of the parcel(s) of land that this application concerns and consent to this action. I hereby permit county officials to enter upon the property for the purposes of inspection relating to this application. **Please note: building permits will not be accepted while this application is pending.**

Owner: _____ Date: _____

I hereby certify that the information and exhibits herewith submitted are true and correct to the best of my knowledge and that in filing the application I am acting with the knowledge and consent of the owners of the property. In submitting the application materials and signing this application agreement, I acknowledge and agree that the application is subject to the applicable processing and public hearing requirements set forth in the Larimer County Land Use Code. I acknowledge that I have obtained or have access to the Larimer County Land Use Code, and that, prior to filing this application, I have had the opportunity to consult the relevant provisions governing the processing of and decision on the application. I understand that this proposal may be delayed in processing if the information provided is incomplete, inaccurate or submitted after the deadline date. I understand that acceptance of this application by Larimer County for filing and receipt of the application fee by Larimer County does not necessarily mean that the application is complete under the applicable requirements of the Land Use Code. I, the applicant, and Larimer County hereby agree that a decision to approve, conditionally approve or deny this application (or a report for Sketch Plan Review) will be rendered no later than _____ days following the date on which this application is filed and determined to be complete by the Larimer County Planning Department, unless the County and the applicant agree in writing to a later date. The Larimer County Planning Department will notify the applicant in writing of the date on which the application is determined to be complete.

Applicant: _____ Date: 4/10/2009

LCPP-125 5/03

This section shall be completed by the applicant

Project information

Project title: **Southern Water Supply Project II**

Project location: quarter section _____ Section _____ Township North Range West **SEE REPORT MAPS FOR LOCATION**

Project address (if available) including the city and zip: **West of Berthoud, Colorado**

Assessor's parcel numbers: **See attached list.**

Area/Units and Lots

Total Project Area (acres):	**5.4 miles / 90' easement**	Acres of Industrial Use:	NA
# of Residential Lots Existing:	NA	# of Industrial Use Lots Existing:	NA
# of Residential Lots Proposed:	NA	# of Industrial Use Lots Proposed:	NA
# of Residential Units Existing:	NA	Acres of Commercial Use:	NA
# of Residential Units Proposed:	NA	# of Commercial Use Lots Existing:	NA
Total Residential Acres:	NA	# of Commercial Use Lots Proposed:	NA
# of Non-Residential Lots Existing:	NA		
# of Non-Residential Lots Proposed:	NA		

Zoning

Current zoning: ☐ GMA: Proposed zoning:

Services

Water supply: Windy Gap and Colorado-Big Thompson water from Carter Lake ☐ On-site well

Sewer system: NA ☐ On-lot septic

Fire District: NA

THE FOLLOWING SECTION SHALL BE COMPLETED BY THE LARIMER COUNTY PLANNING DEPARTMENT

Location description: _____

Request comments:

Project access:

Trips generated by proposal:

Proposed use: Hearing date: Staff Planner:

Staff use only:

Date Received _____ File # _____ Check # _____ Amount paid $ _____ Sign given _____

LCPP-125 5/03

Parcel No.	Site Address	Schedule No.	Name 1	Name 2
0424000013	393 SCHOFIELD RD	1372033	BEST, GLENN H/LORRAINE Y	
0414005702	1420 N COUNTY ROAD 27E	1446959	PETERMAN, LLOYD	
0414000017		0626031	PETERMAN, LLOYD	
0413000009		1333755	PHIPPS, WAYNE L	
0413000012		1445782	MELIKIAN, ARMEN	JACQUELINE D
0424000002	201 SCHOFIELD RD	0625183	GILLETTE, STEPHEN W/KATHERINE L	
0424000020	189 SCHOFIELD RD	1580431	MURPHY, JOHN FOISTER/STEPHANIE L	
0424000011	5937 W COUNTY ROAD 6	1337521	VON LINTEL, KENNETH F	SHERYL A
0424000018	5921 W COUNTY ROAD 6	1426842	BERGAN, DARLENE BOATTINI	
0424000001	5628 W COUNTY ROAD 6	0625175	BANDERET, NANNA E	
0425000002		0489808	HUANG, PAO CHIN R/HUI-YU	TZU-LING/TZU-EN/HWAI-
0436000070	6715 W COUNTY ROAD 4	0663999	CARPENTER, THOMAS D	BETTY BOSMAN
0436000044		0486965	TVETEN, ALAN BRIAN	
0413000003	7130 SEDONA HILLS DR	0625159	PEDERSON, ROBERT/TRESSA	
0414107701		1629243	BENNET, THELMA, TRUSTEE	BENNET, THELMA, LIVING TRUST
0414106701	6232 W COUNTY ROAD 8E	1629242	RIEWE, MYRON	
0414000027	1275 N COUNTY ROAD 27E	1325531	JOSEPH, DOUGLAS D	STEPHANIE
0414000929	6981 W COUNTY ROAD 8E	1581409	LITTLE THOMPSON WATER DISTRICT 1/2	CENTRAL WELD COUNTY WATER DIST

LCPP-125 5/03

AECOM

Siting Study, March 2011

Southern Water Supply Project II

Prepared for:

Northern Colorado Water Conservancy District

SOUTHERN WATER SUPPLY PROJECT II

Siting Report

Prepared by
AECOM
240 East Mountain Avenue
Fort Collins, CO 80524

In association with Integra Engineering

Prepared for
Northern Colorado Water Conservancy District
220 Water Avenue
Berthoud, Colorado 80513
(970) 532-7700

March 2011

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1. INTRODUCTION

This report provides documentation of an alternative route evaluation study performed for the Southern Water Supply Project (SWSP II), a project proposed by the Northern Colorado Water Conservancy District (Northern Water) acting by and through the Southern Water Supply Project Water Activity Enterprise. The SWSP II is a planned water transmission pipeline, which begins at Carter Lake in Larimer County and extends south into Boulder County, terminating near Boulder Reservoir. The northern portion of the pipeline, i.e., that portion of the line within Larimer County and the northern segment within Boulder County, will parallel the original SWSP pipeline (constructed in 1995). After crossing south of the St. Vrain River, however, the original SWSP pipeline alignment turns east toward an urbanized area within the City of Longmont. Between this point and the terminus near Boulder Reservoir is the area where routing decisions are most critical, and this is the area that is the subject of this route evaluation study.

On May 13, 2009, Northern Water submitted an application for approval of SWSP II pursuant to Boulder County's 1041 process. In response to that application, the Boulder County Board of County Commissioners requested an evaluation of alternative routes with the goal of identifying "less environmentally damaging alternatives". This route evaluation study was prepared in response to that request.

The purpose of this study is to reevaluate routing alternatives for that portion of the SWSP II project located south of the St. Vrain River crossing; more specifically, the segment extending from St. Vrain Road near the Boulder County Parks and Open Space building in the City of Longmont, to the two southernmost project connection points at the Left Hand Water District (LHWD) Dodd Water Treatment Plant (WTP) and City of Boulder's Boulder Reservoir WTP. The study area defined for the route evaluation effort encompasses all of these connection points and includes a portion of St. Vrain Creek to the north, Table Mountain and Boulder Reservoir to the west, Boulder Reservoir and State Highway (SH) 119 to the south, and SH 287 to the east.

Guidance provided by Boulder County in a letter dated October 14, 2009 (Appendix 1) indicated that the route evaluation study should consider a minimum of three alternatives, including the original preferred route identified in Northern Water's 1041 application, and an alternative utilizing the existing SWSP easement through Longmont and then following an alignment along SH 119. Two additional alternatives were also developed, as discussed further in the remainder of this report.

The overall study process for defining and analyzing alternative routes is illustrated in Figure 1. Key steps in the process are summarized below:

- **Data Collection**. Relevant information on land use, natural resources, and other considerations was collected within a study area extending from Hygiene Road on the north to just south of Boulder Reservoir. On an east to west basis, the study area extended from approximately Panama Reservoir to Neva Road.
- **Develop Alternative Routes**. As indicated earlier, two alternatives were carried into the study, including the previously proposed route and a route that utilizes a combination of the existing SWSP easement through Longmont and an alignment adjacent to SH 119. Two additional

alternatives were defined using the data collected in the prior step. Following initial data review and field visits, the alternatives were refined to avoid conflicts and optimize the use of existing rights-of-way (ROWs) and other siting opportunities.

- **Define Route Evaluation Criteria**. A series of evaluation criteria was defined, using guidance provided by Boulder County.
- **Route Refinement**. Rank and Display Results. Each alternative was then evaluated using the data previously collected and the route evaluation criteria.

Each of these steps and the results obtained are described further in the remainder of this report.

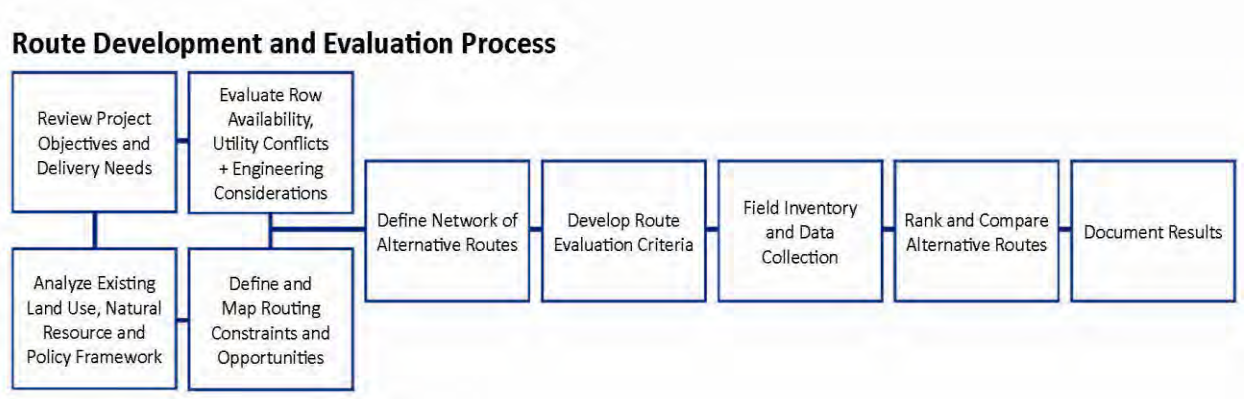


Figure 1. Overall Study Process

Based on a thorough analysis of the alternatives, Alternative 1 is the least damaging alternative. Alternative 1 has the lowest disturbance to trees, lowest level of transportation effects, and has the least amount of conflict with existing utilities. It is also close to having the lowest amount of disturbance to agricultural lands. In addition, Alternative 1 has the lowest number of parcels crossed and close to the lowest number of residences within 100 feet. For other considerations such as stream crossings, wetlands, crossings of critical habitat, and riparian vegetation, Alternative 1 falls in the mid-range among the alternatives considered. Although other alternatives have an advantage on some individual evaluation criteria, none are consistently better or result in less environmental damage.

The environmental impacts associated with Alternative 1 can be mitigated to minimize both the short- and long-term effects. Impacts to riparian forest through Left Hand Creek are minimized by the alignment that Alternative 1 takes, which routes the construction between the large trees, thereby avoiding impacts that are reflected in an overall acreage calculation. Timing of construction across the larger perennial and intermittent drainages will occur in winter to minimize impacts to active wildlife. Nearby raptor nests will be avoided during the nesting season. Open space and conservation land designations, as well as agricultural land uses, will be mitigated by fully revegetating the easement to pre-construction conditions. Construction on agricultural and irrigated lands will occur when soil conditions are dry to the extent possible to minimize the collapse of soil structure and increased compaction. Soil amendments and decompaction (through deep ripping) or subsoil will be used if

compaction occurs. Flood irrigated fields will be restored and grade adjustments will be made if settling occurs. Any tile drains encountered will be repaired.

2. DATA COLLECTION

A study area was defined with a sufficient area to encompass a reasonable range of routing alternatives. An area was defined extending from a point along St. Vrain Road, where the existing SWSP pipeline turns to the southeast, south to the termination point near Boulder Reservoir. On an east-west basis, the area was defined to extend from the eastern edge of Panama Reservoir to Neva Road, a distance of approximately 8 miles.

Baseline GIS data were collected for the study area utilizing a number of sources, such as Boulder County, City of Longmont, City of Boulder, Colorado Department of Transportation (CDOT), the State of Colorado, Colorado Water Conservation Board and the Colorado Division of Water Resources, Colorado Division of Wildlife (CDOW), and Colorado Natural Heritage Program (CNHP). Some of the data were field checked; however, the extent of this was limited since the alignments of some alternatives were only viewed from public ROWs. A description of the datasets is provided in the remainder of this section.

Data collected during this step were initially used to inform the route development process. As described in Section 4, the data were then used to evaluate each of the routes. Maps showing the alternative routes and their relationship to each of the data categories are included in that section. Section 4 also provides a more detailed discussion of how each route interacts with the mapped resource occurrences.

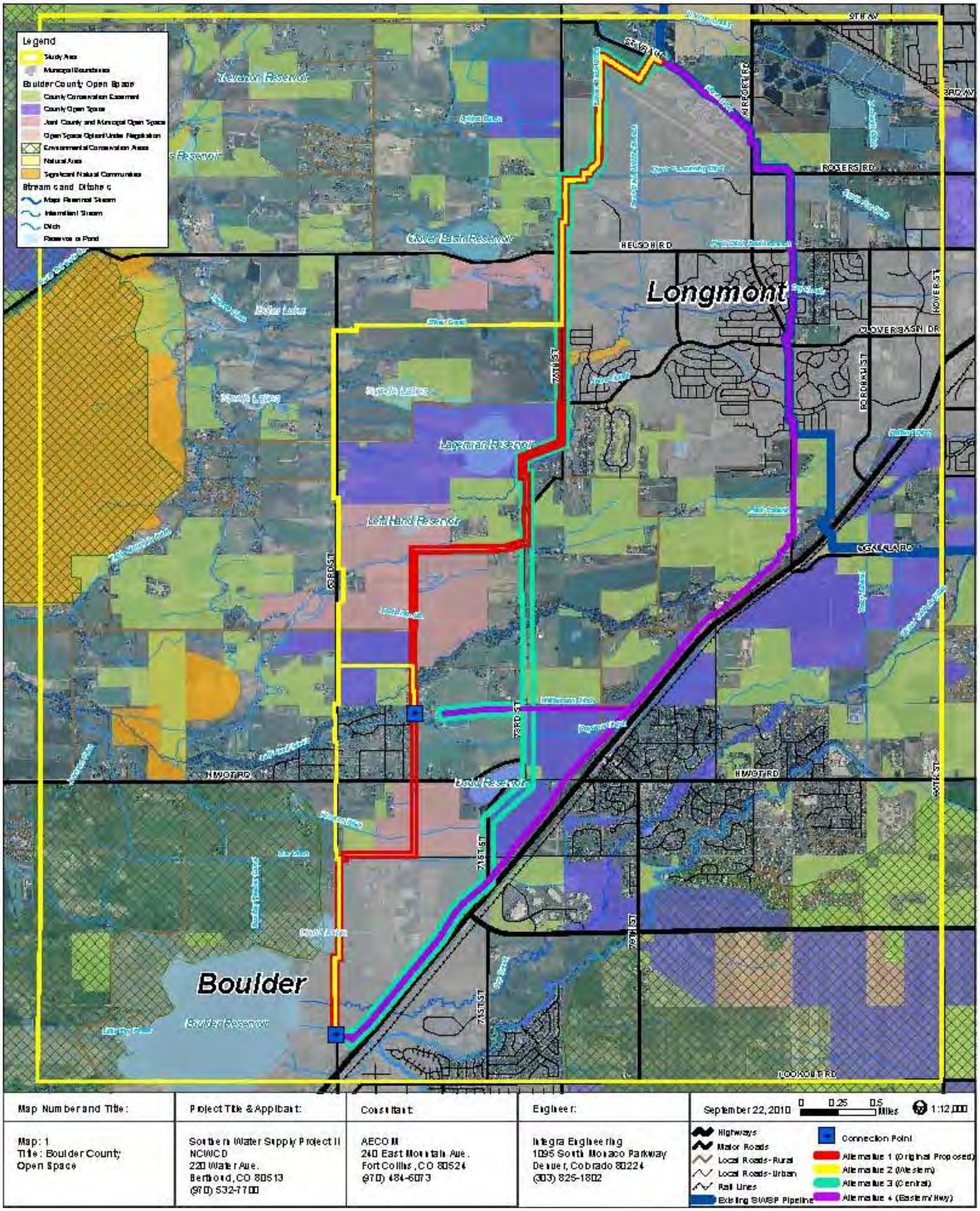
a. Streams

Water features include streams and creeks, natural drainages, canals and ditches, and reservoirs. The source of this data is Boulder County. The focus of this data was specifically impacts or number of crossings of perennial and intermittent streams. Man-made features, such as canals, ditches, and reservoirs were not analyzed, but habitat associated with these features was included in other resources.

Left Hand Creek

Map 1 shows natural drainages within the study area, categorized as perennial or intermittent, as well as ditches. Perennial drainages within the study area include the St. Vrain River at the north end and Left Hand Creek. Although minor drainages, the Boulder County dataset indicates that Dry Creek below Boulder Reservoir and another Dry Creek located further north are also perennial drainages. Intermittent drainages include Clover Basin Creek, Silver Creek, Lykins Gulch (currently under construction), and several unnamed drainages. Larger ditches, which often include a habitat component, include the Peck, Holland, and Hinman ditches.

Map 1. Boulder County Open Space



b. Riparian

Riparian vegetation data were obtained from CDOW. This dataset contains some vegetation classifications that are more appropriate to be counted in the wetland calculations, including cattails, sedges, and rush. To avoid double-counting these polygons, these vegetation classes were extracted and used in the wetland dataset. Non-wetland areas of riparian vegetation were retained in this category, including areas shown in Map 2 as cottonwoods, riparian shrub, and riparian herbaceous.

Cottonwood Riparian Vegetation at Left Hand Creek

The greatest extent of riparian vegetation occurs along the St. Vrain River and Left Hand Creek. The riparian vegetation associated with Left Hand Creek is important habitat for wildlife and provides a corridor for animals to travel, especially through some of the more densely developed areas in this part of Boulder County. The riparian vegetation along this creek is dominated by narrowleaf cottonwood. Although these trees are resilient due to their evolution in a flood/scour zone, impacts to their roots could weaken the structural integrity of the trees making them more susceptible to being blown down in high winds. Intermittent drainages and ditches usually have a narrow band of riparian vegetation, if any.

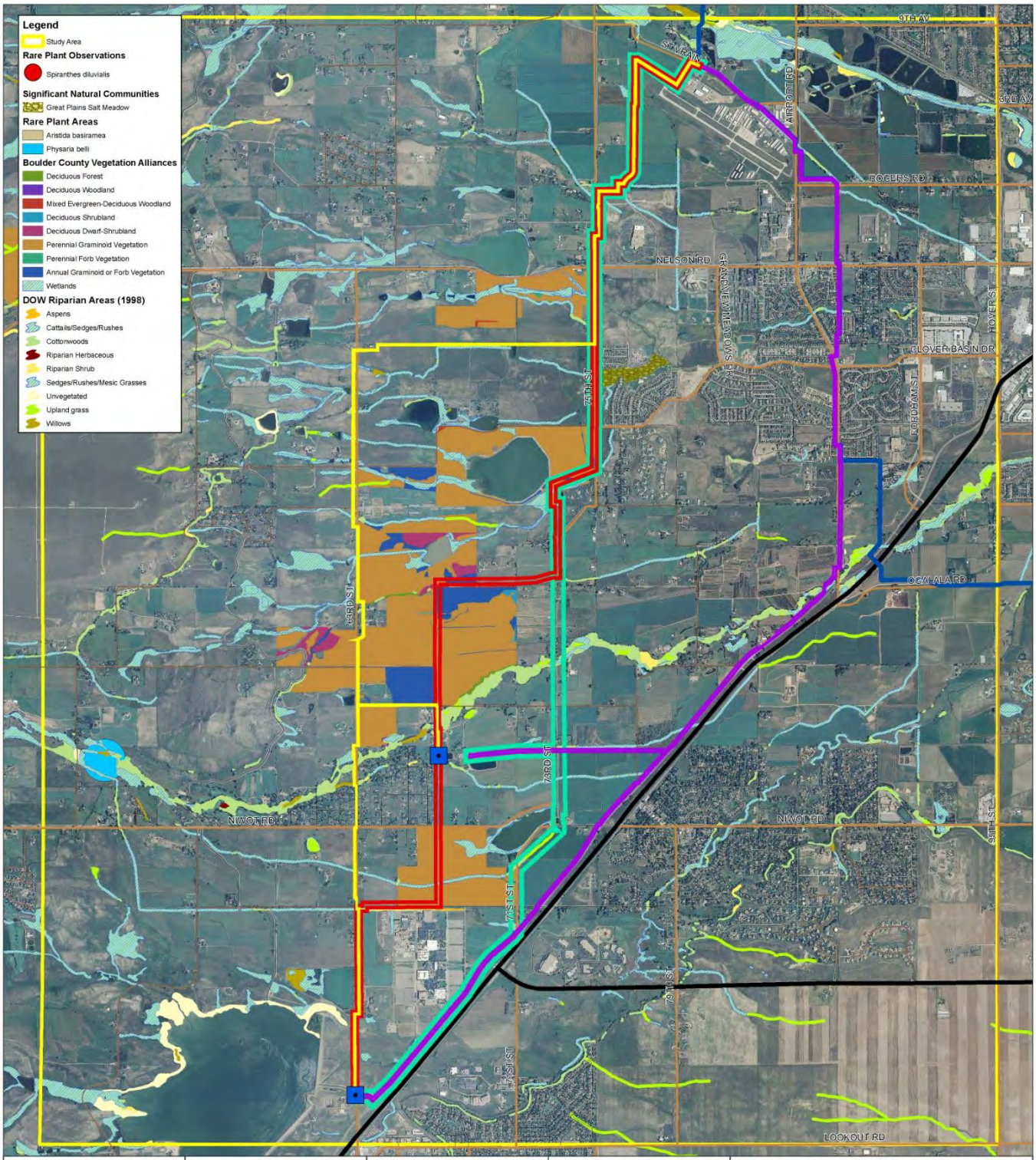
c. Wetlands

Wetland data were obtained from Boulder County and CDOW. Two sources of wetland data came from Boulder County, including one for the entire county, as well as more detailed data for county open space properties. In addition, CDOW has a riparian vegetation dataset that includes wetland categories, such as cattails, sedges, and rush. The largest of the wetlands are located adjacent to the larger reservoirs, such as Boulder, Lagerman, and Clover Basin reservoirs. Most of the other wetlands are small slivers adjacent to the numerous creeks, ditches, and unnamed drainages. The CDOW wetland data were extracted and combined with the other two datasets from Boulder County. A composite of all of these datasets was then created.

Wetland Near Lagerman Reservoir

The data were reviewed by the project team and wetland crossings were avoided where possible, especially where the route parallels linear wetlands. As shown in Map 2, wetlands are concentrated in the St. Vrain River floodplain and along a series of small drainages that lie between the Swede Lakes and Left Hand Reservoir. Wetlands are also associated features with canals and irrigation ditches, as well as intermittent drainages.

Map 2. Vegetation Communities, Riparian Habitat, Rare Plants, and Wetlands



d. Significant Natural Communities

Great Plains Salt Meadow

Boulder County provided a spatial dataset for Significant Natural Communities. These communities include Great Plains salt meadow and Great Plains mixed grassland prairie. The Great Plains salt meadow is located on the east side of 75th Street along Dry Creek, and has been impacted by the Meadow Mountain residential development. A small portion of this natural community persists along the margins of Dry Creek. The Great Plains mixed grass prairie is located at Table Mountain on the far west side of the study area. No other significant natural communities fall within the study area. Significant Natural Communities are shown in Map 2

e. Native and Landscape Trees

Native Plains Cottonwoods Trees Adjacent to Holland Ditch

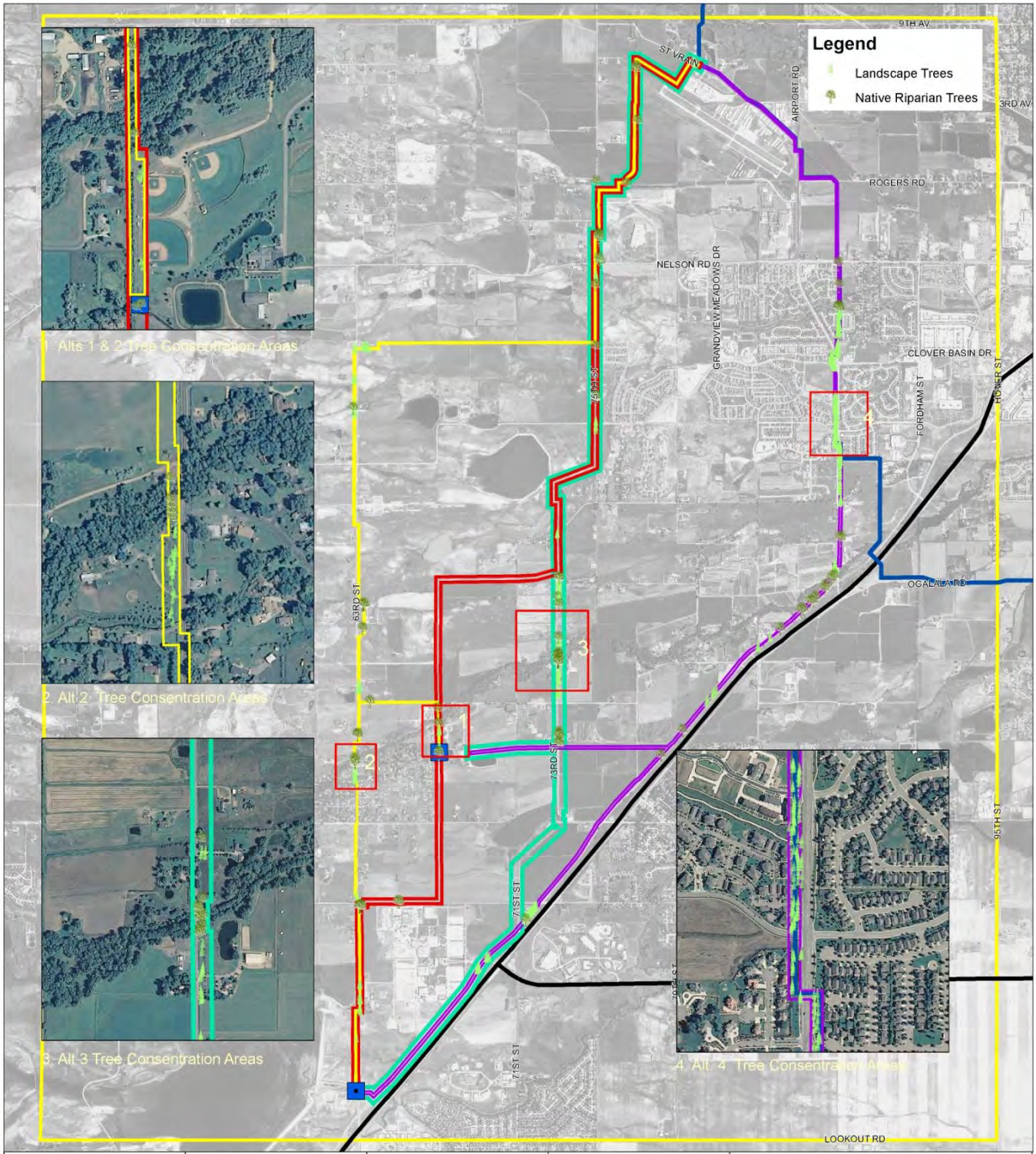
Trees were mapped using a combination of aerial photography and field verification. Trees were designated by type. Native riparian trees, such as cottonwood, coyote willow, and peachleaf willow were identified, as well as other landscape trees. Trees within proximity of potential alternative routes were identified and reviewed in more detail to determine if pipeline construction would impact these trees within the easement. Map 3 shows the location of individual trees located in proximity to an alternative route that would be impacted, excluding nonnative species, such as Russian olive, crack willow, and Siberian elm.

f. Critical Wildlife Habitat

Critical Wildlife Habitat at Lagerman Reservoir

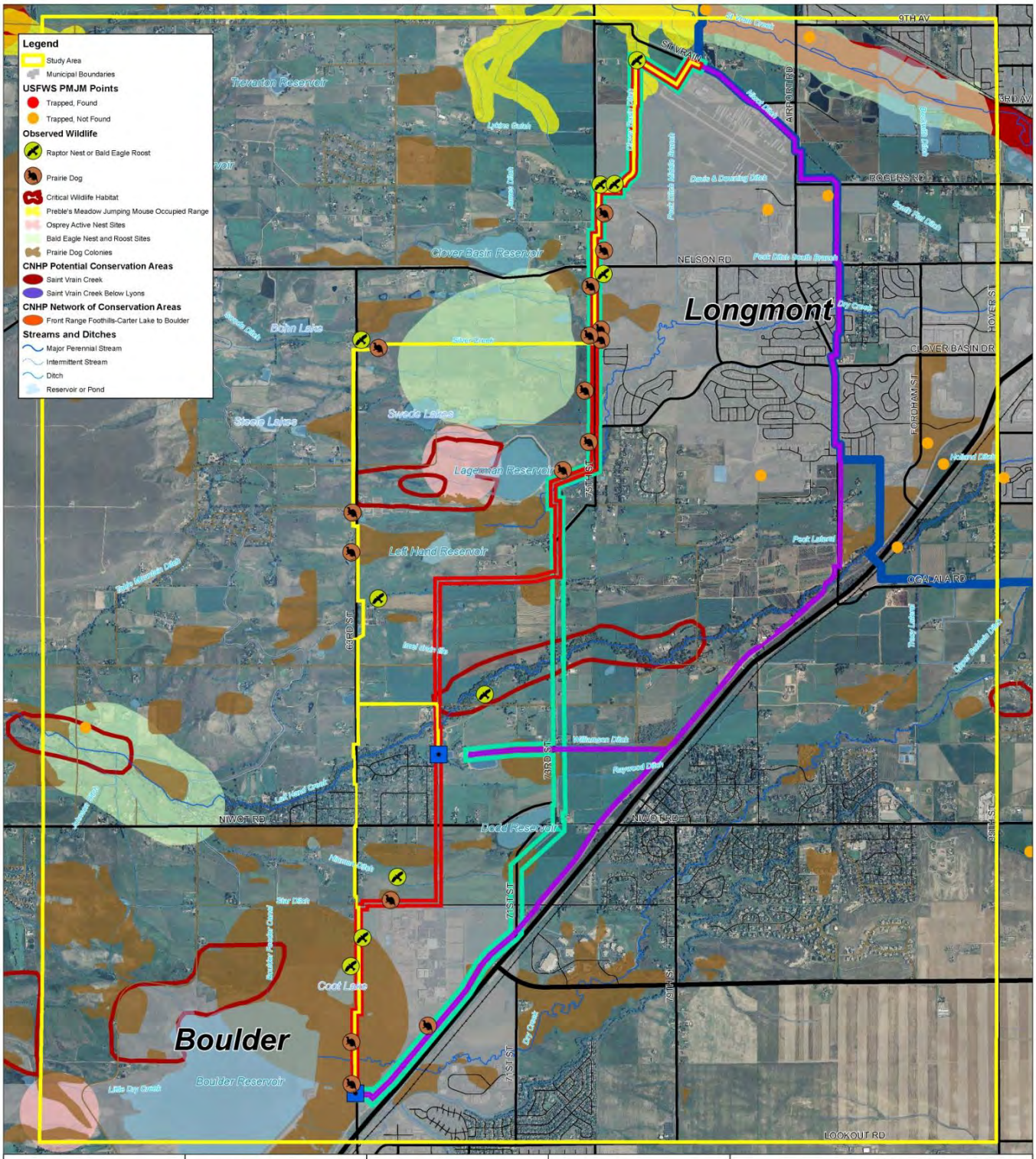
Boulder County provided spatial datasets for critical wildlife areas, eight of which fall within the study area. These include (starting from west to east) Boulder Valley Ranch, Left Hand Creek Cottonwood Groves (1st), Boulder Reservoir, Lagerman Reservoir, Left Hand Creek Cottonwood Groves (2nd), Little Gaynor Lakes (1st), Little Gaynor Lakes (2nd), and Panama Reservoir. Only two designated critical wildlife habitat areas are in close proximity to any of the alternative routes, including the Left Hand Creek Cottonwood Groves (2nd) and Lagerman Reservoir critical wildlife area. Critical wildlife habitat areas are shown on Map 4.

Map 3. Tree Count



Map Number and Title:	Project Title & Applicant:	Consultant:	Engineer:	September 22, 2010 0 0.25 0.5 Miles 1:12,000
Map: 3 **Title: Native Riparian and Landscape Trees**	Southern Water Supply Project II NCWCD 220 Water Ave. Berthoud, CO 80513 (970) 532-7700	AECOM 240 East Mountain Ave. Fort Collins, CO 80524 (970) 484-6073	Integra Engineering 1095 South Monaco Parkway Denver, Colorado 80224 (303) 825-1802	Highways Existing SWSP Pipeline Connection Point Alternative 1 (Original Proposed) Alternative 2 (Western) Alternative 3 (Central) Alternative 4 (Eastern/Hwy)

Map 4. Wildlife, Habitats, and Conservation Areas



g. Threatened and Endangered Species Habitat

Threatened and endangered species habitat data were collected from the CNHP using their potential conservation area (PCA) dataset. These areas are shown on Map 4. There are two PCAs designated by CNHP that fall within the study area, including St. Vrain Creek, below Lyons and St. Vrain Creek. These PCAs cover the entire St. Vrain River corridor through the study area. The St. Vrain Creek below Lyons PCA was established based on the potential habitat for Preble's meadow jumping mouse (*Zapus hudsonius preblei)* (PMJM), federally threatened, Utes ladies' tresses orchid *(Spiranthes diluvialis)*, and bald eagle roosting.

The St. Vrain Creek PCA was established based on the potential habitat for southern redbelly dace (*Phoxinus erythrogaster*, S1), stonecat (*Noturus flavus*, S1), brassy minnow (*Hybognathus hankinsoni*, S3), and the common shiner (*Notropis cornutus,* S2). There is also a nesting occurrence of bald eagle (*Haliaeetus leucocephalus*, G5/S1B,S3N). In addition, cylindrical papershell (*Anodontoides ferussacianus*) and northern redbelly dace (*Phoxinus eos*) have also been documented in the 1970s and 1900s, respectively. These two PCAs overlap each other along St. Vrain Creek for approximately 2 miles. The existing SWSP pipeline crosses through both of these PCAs. The alternatives analysis starts south of these PCAs.

CDOW shows the occupied range for PMJM to include the upper portion of St. Vrain Creek that crosses into the northernmost portion of the study area. In addition, PMJM occupied range includes portions of the Clover Basin Ditch, Davis & Downing Ditch, James Ditch, Niwot Ditch, South Branch, North Branch, Runyan Ditch, and a number of other minor ditches. A habitat assessment would need to be performed where the routes cross these areas before ground disturbance. This has been completed for Alternative 1, with a determination that the project would have no effect on PMJM.

There is a potential for Utes ladies' tresses orchid to occur in areas with high ground water adjacent to wetlands or wet meadows. These specific areas were not identified as part of this analysis, but U.S. Fish & Wildlife Service (USFWS) protocol level surveys would need to be completed for suitable habitat along the selected route. A survey was previously completed along Alternative 1 and no orchids were identified.

h. Raptor Nests

CDOW bald eagle and osprey nest sites were also reviewed. One osprey nest site occurs on the west side of Lagerman Reservoir. No bald eagle nests were identified within the study area. No data for other raptor nests for the study area were available, but those nests identified in the field were recorded as part of the analysis. Map 4 shows the locations of raptor nests.

Red-tailed Hawk Nest Near 75th Street and St. Vrain Road

i. Roost Sites

CDOW provided datasets for bald eagle roost sites. A number of sites occur within the study area, including bald eagle roost sites along St. Vrain Creek, Silver Creek, and Left Hand Creek at the west side of the study area. This information is shown on Map 4.

Prairie Dog Colony Near 75th Street and Nelson Road

j. Prairie Dog Colonies

A spatial dataset for prairie dog colonies was provided by Boulder County. There are 3,642 acres of prairie dog colonies within the study area. Additional prairie dog colonies were identified in the field during the field visit along the alternative alignments; however, the extent of these colonies was not mapped due to limited property access. Previously mapped prairie dog colony locations are shown in Map 4.

k. Open Space and Conservation Easements

Boulder County and City of Boulder open space spatial datasets were provided by Boulder County. As shown in Map 1, open space areas are located throughout the study area. In total, there are 155 open space parcels within the study area, totaling 7,618 acres. In addition, there are eight parcels under negotiation to be added to open space for an additional 395 acres. The largest of the open spaces is the Imel property at 505 acres.

In addition, approximately 7,080 acres that are under conservation easement are located within the study area. This acreage is comprised of 257 parcels. Two parcels totaling 1.4 acres are currently in negotiation for conservation easements. The conservation easements are distributed throughout the study area. Map 1 also shows the locations of areas with conservation easements in place.

l. Environmental Conservation Areas

There are five Boulder County designated environmental conservation areas within the study area, including South St. Vrain/Foothills, Table Mountain, Boulder Valley Ranch/Beech Open Space, White Rock Gunbarrel Hill, and East County. The locations of these areas are shown on Map 1. With the exception of the environmental conservation area (ECA) near Boulder Reservoir, none of these areas are located near potential route alternatives.

m. Natural Landmarks and Natural Areas

There are four Boulder County designated natural landmarks within the study area, including Hygiene Plains Cottonwood, Hygiene Hogback, Table Mountain, and Haystack Mountain. All of these designated natural landmarks occur west and north of the potential route alternatives.

n. Residential and Commercial Uses

Urban land uses are shown on Map 5. These are concentrated within the incorporated areas of Longmont and Boulder. Areas of more continuous development outside of incorporated municipal boundaries were also considered in route development. The largest of these areas is located east of SH 119 in the Niwot area. Another extensive area of development is located in the vicinity of 63rd Street and Niwot Road. Other major land uses include the Vance Brand Airport in Longmont and IBM facility in Boulder.

o. Significant Agricultural Lands

The significant agricultural lands spatial dataset was provided by Boulder County. This dataset identifies agricultural lands of national, state, and local importance. The hierarchy ranks lands of national importance as having the highest significance and lands of local importance as having a lower significance. In general, the more important lands are irrigated and were previously designated by the Natural Resources Conservation Service (previously Soil Conservation Service) as prime farmland.

Flood Irrigated Agricultural Land on the Imel Property

Any agriculturally significant lands that fell within either the City of Longmont or City of Boulder municipal boundaries were removed from this dataset, as well as parcels smaller than 2 acres. The reason for this update is to remove a designation from those areas that are or will be developed. Also, lands that have become developed or that are no longer cultivated were removed from the significant agricultural lands dataset.

An overlay on Map 6 shows the locations of lands of national, statewide, and local importance.

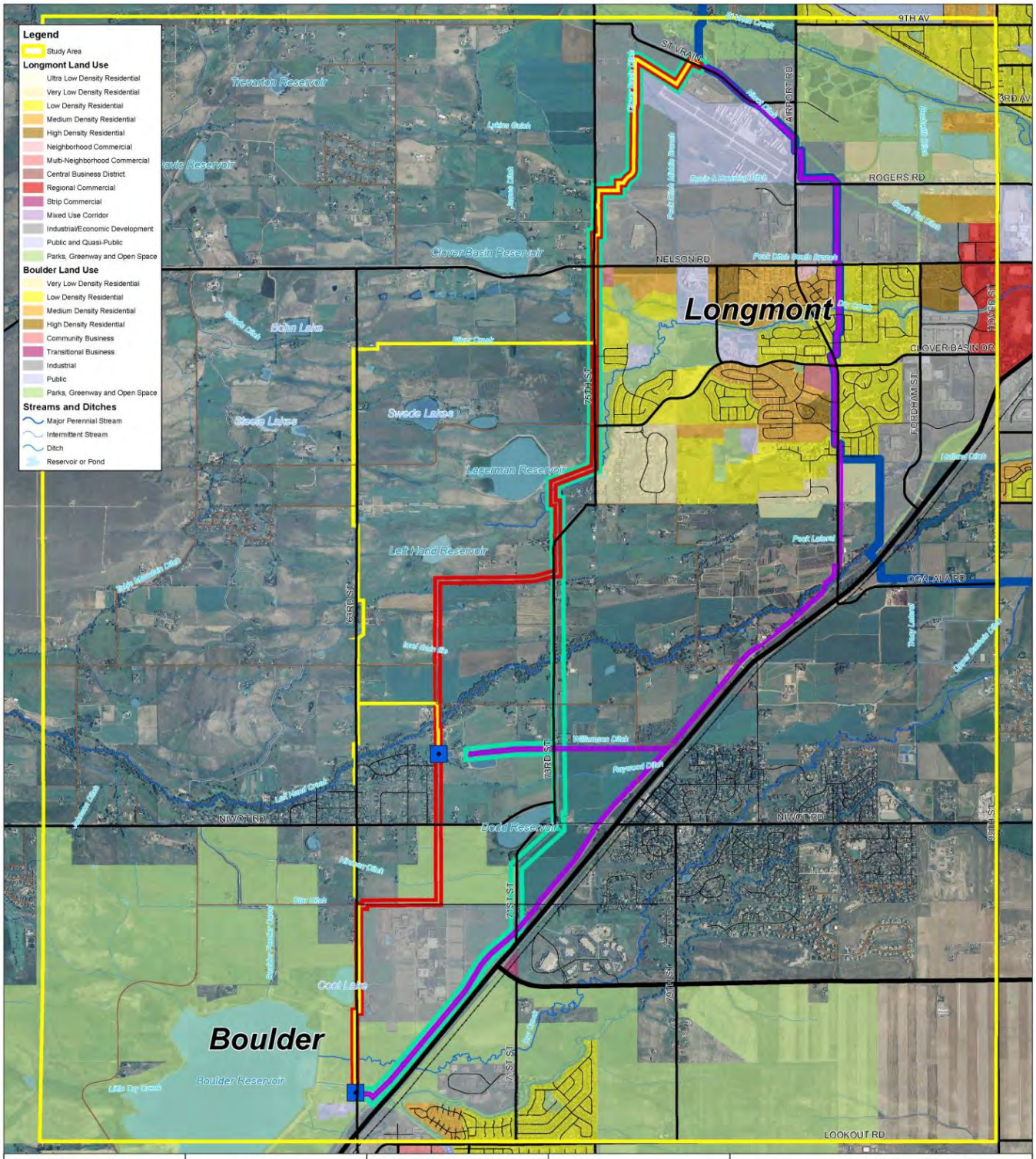
p. Irrigated Lands

Map 6 also shows the locations of lands that are cultivated, either irrigated or dryland cultivation. This information was derived from a spatial dataset for 2005 irrigated lands provided by the Colorado Water Conservation Board and Colorado Division of Water Resources. This dataset was supplemented by the Boulder County agricultural field dataset, which includes a number of parcels that were not included in the statewide dataset. As with agricultural lands of national, statewide, and local importance, those areas within the City of Longmont and City of Boulder municipal boundaries, or within parcels smaller than 2 acres, were excluded. Approximately 13,239 acres of irrigated land occur within the study area. With the exception of a few center pivots, most of the irrigated land in the project area is flood irrigated. Areas of dryland cultivation are located south and east of SH 119 and are not encountered by any of the alternatives.

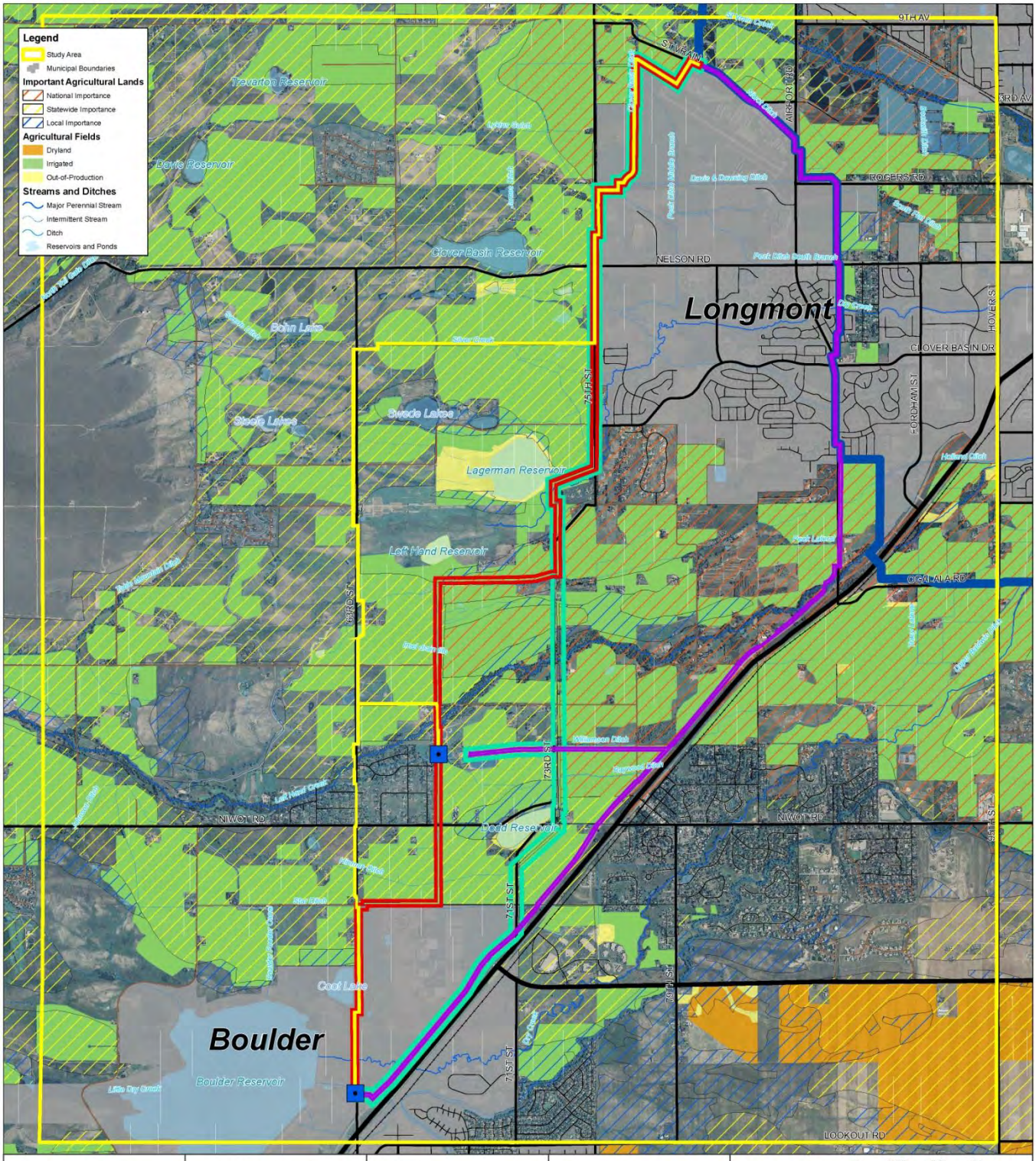
q. Transportation

Research on Boulder County road ROWs was initiated by contacting the Boulder County Transportation Department, Engineering Division, and also utilizing available GIS data from Boulder County. The Boulder County Transportation Department provided copies of the project drawings for the County's

Map 5. Municipal Land Uses



Map 6. Agricultural Lands



Map Number and Title:	Project Title & Applicant:	Consultant:	Engineer:	September 22, 2010 — 0 0.25 0.5 Miles — 1:12,000
Map: 6 **Title: Agricultural Lands**	Southern Water Supply Project II NCWCD 220 Water Ave. Berthoud, CO 80513 (970) 532-7700	AECOM 240 East Mountain Ave. Fort Collins, CO 80524 (970) 484-6073	Integra Engineering 1095 South Monaco Parkway Denver, Colorado 80224 (303) 825-1802	Highways Major Roads Local Roads-Rural Local Roads-Urban Rail Lines Existing SWSP Pipeline Connection Point Alternative 1 (Original Proposed) Alternative 2 (Western) Alternative 3 (Central) Alternative 4 (Eastern/Hwy)

recent N. 73rd St./N. 75th St. Reconstruction Project (Project No. RD-033-098) and N. 63rd St. Reconstruction Project (Project No. RD-039-153). These two roadways are the main north-south county roads within the study area. Drawings were also obtained for Boulder County's Airport Road Improvement Project & Structure BC-25-4.7-LT (Project No. RD-025-048), which widened Airport Road to four lanes south of Longmont to SH 119, and replaced the bridge over Left Hand Creek at the intersection with SH 119.

Research on the SH 119 ROW was initiated by contacting CDOT to obtain the ROW drawings. This information was also cross-checked with the dataset from Boulder County. Drawings were also obtained for the proposed CDOT SH 119/SH 52 Interchange project to determine what impacts this future project may have on a proposed pipeline alignment paralleling SH 119.

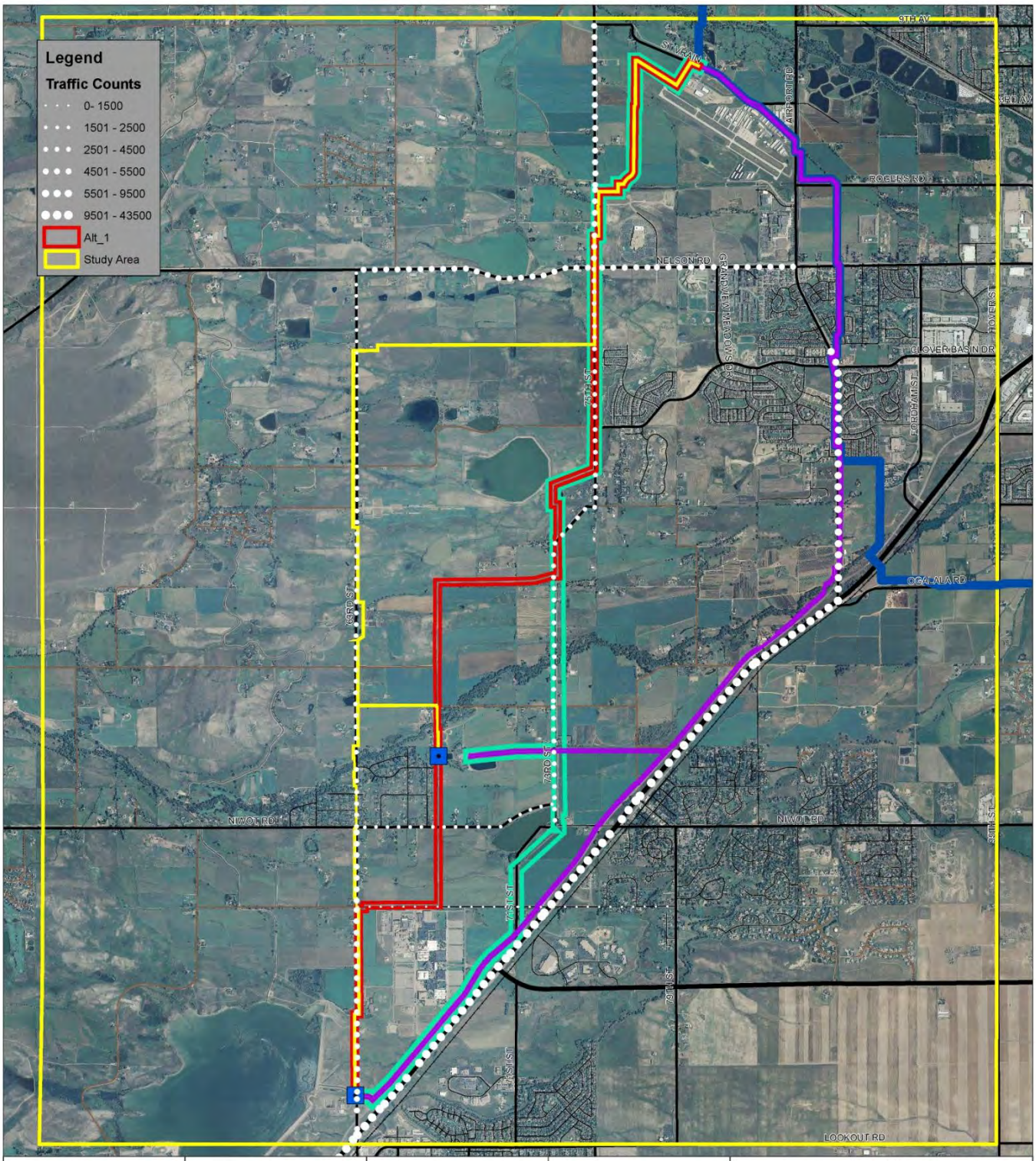
Potential pipeline alternative routes were considered that parallel a number of roadways, including county roads, Airport Road in Longmont, and SH 119. Discussions with CDOT, City of Longmont, and Boulder County indicate there would likely be reduced speed limits through the work zone and potentially single lane closures and/or flaggers to facilitate trucks and other equipment from the roadway into and out of the work zone. Input from the agencies having jurisdiction over the roadways was gathered to determine access to and limitations of work in the ROW. Daily traffic counts were collected for several of the roadways in these alignment corridors. These traffic counts provide a quantitative method to assess the number of Boulder County citizens that will be impacted by this construction.

Traffic Counts

Following is the 2009 AADT information for major roadways in the project area (shown in Map 7):

- N. 75th Street – north of Nelson Road – 5,114
- N. 75th Street – south of Nelson Road – 3,816
- N. 73rd Street – at Nimbus Road – 4,384
- Nelson Road – just west of N. 75th Street – 5,340
- Nelson Road – just east of N. 65th Street – 4,071
- Nelson Road – just east of N. 63rd Street – 4,501
- N. 63rd Street – at Nelson Road – 2,247
- N. 63rd Street – just north of Oxford Road – 2,611
- N. 63rd Street – just south of Oxford Road – 2,476
- N. 63rd Street – just north of Niwot Road – 2,626
- N. 63rd Street – just south of Niwot Road – 4,953
- N. 63rd Street – south of Monarch Road – 4,932
- Niwot Road - just east of N. 63rd Street – 2,213
- Monarch Road – at SH 119 – 1,430
- Airport Road – north of SH 119 – 9,398
- SH 119 at N 63rd Street-43,500
- SH 119 at SH 52-37,600
- SH 119 at Ogallala/Airport Road-32,600

Map 7. Traffic Counts



Map Number and Title:	Project Title & Applicant:	Consultant:	Engineer:	September 22, 2010 0 0.25 0.5 Miles 1:12,000
Map: 7 **Title: Traffic Counts**	Southern Water Supply Project II NCWCD 220 Water Ave. Berthoud, CO 80513 (970) 532-7700	AECOM 240 East Mountain Ave. Fort Collins, CO 80524 (970) 484-6073	Integra Engineering 1095 South Monaco Parkway Denver, Colorado 80224 (303) 825-1802	Highways Major Roads Local Roads-Rural Local Roads-Urban Rail Lines Existing SWSP Pipeline Connection Point Alternative 1 (Original Proposed) Alternative 2 (Western) Alternative 3 (Central) Alternative 4 (Eastern/Hwy)

One of the principal considerations used in developing the alignments was to co-locate with existing corridors. As a result, the pipeline alignments parallel a number of roadways, including county roads (e.g., 63rd Street, 73rd Street, and 75th Street), Airport Road in Longmont, and SH 119. Issues associated with ROW alignments are:

- Existing and future utility conflicts;
- Conflicts with future roadway and bridge improvements, and;
- Traffic and other public impacts associated with construction and/or maintenance activities.

Boulder County

Utility construction work within Boulder County road ROWs is governed and administered under the Boulder County Utility Construction Permit Requirements. General Policies under the Boulder County Utility Construction Permit are as follows:

- Work is to be planned so as not to create safety hazards, maintenance problems, render portions of ROW infeasible for future road improvement, or to obstruct drainageways.
- Longitudinal installations are to be placed outside of the maintained portions of the roadbed when possible.
- Longitudinal installations shall be discouraged from being placed in the wheel path.
- Transverse installations shall be "jacked" or bored under the road. Open excavations will be permitted only in instances where boring is proven infeasible due to site geology or the presence of existing utility conflicts.

There are several other issues associated with construction work within Boulder County Road ROW:

- Boulder County can request that the applicant provide and secure unto the County a bond, or other suitable performance guarantee, for the total amount required to restore public property.
- All road level pipeline appurtenances shall be of heavy-duty construction, capable of safely supporting legal highway loading, anticipated maintenance equipment and vehicular, and shall conform to the finished grade of the road.
- No pole, structure or aboveground installation shall be set less than 10 feet from the edge of the travelled way on local roads, and 20 feet on arterials.
- Boulder County roadways can be proposed for closure during construction, however, the road closure request must be submitted to the Boulder County Board of County Commissioners for approval and the County reserves the right to deny the closure of a road.
- Construction work requiring a lane closure, requires a Boulder County approved traffic control plan, certified flag persons, and adequate warning signs, barricades, lighting, flags, and other devices as specified in the latest Manual on Uniform Traffic Control Devices, all provided, maintained, and paid for by the applicant.
- After completion of the authorized work, maintenance and repair of the installation shall be the applicant's or owner's responsibility for a period of 2 years. In the event that damage to the road results from the utility construction, the utility owner shall be liable for the road repairs.

- In the event any changes are to be made in a County road that would necessitate the removal or relocation of a utility, the relocation or removal shall be at the utility owner's expense.

Boulder County Transportation Utility Construction Requirements:

- Trench backfill within 12 inches of finished grade shall consist of road base. In some cases, full depth road base or flowable fill may be required by the County.
- Temporary hot asphalt or cold mix shall be placed immediately in all patch areas on all arterial and collector streets, and within 7 calendar days on all others.
- Such temporary patches shall be removed and replaced by a permanent hot bituminous pavement within a maximum of 10 working days.
- If a utility line is placed longitudinally under the existing asphalt roadway, the roadway shall be patched, then a surface treatment commensurate with the existing road conditions (i.e., asphalt overlay, chip seal, etc.) shall be placed for the length of the project.
- The width of the surface treatment will be a minimum of the width of one lane of the roadway, and may be required to be the width of the entire roadway, based upon the determination of the County.
- If a utility cut is to made in any County road in which the age of the asphalt pavement surface is less than 3 years old, the utility owner will be required to patch the excavated area and overlay the entire width of road, for the length of the disturbance, with 2" of CDOT Grade SX hot mix asphalt.

The selection of the alternative pipeline alignments took into consideration the Boulder County Transportation Department's stated preference of not locating the pipeline within the asphalt road surface wherever possible, as well as the stringent requirements for asphalt overlay or other surface treatment, particularly the requirement for full-width 2-inch asphalt overlay for any utility cut in a roadway where the asphalt surface is less than three years old. As stated previously, N. 63rd Street, N. 73rd Street/N. 75th Street, and Niwot Road have been recently reconstructed by the county. With the existing area between the edge of asphalt and the ROW line typically having existing utilities (as a result of Boulder County Transportation's general policy for avoiding utility installation within the roadway), constructing a large diameter water transmission pipeline within Boulder County road ROW is difficult to achieve. Considering these issues (as well as the need for additional construction space both during construction and for maintenance or repair purposes) and the potential risk for damage to the pipeline if located within road ROW, all of the alternative pipeline alignments typically utilize permanent easement adjacent to road ROW, except where other circumstances would force the alignment within road ROW.

This use of permanent easement greatly reduces the potential impacts to Boulder County roadways. Impacts are typically limited to the perpendicular road crossings. As stated previously, the crossings of paved county roads are proposed to be accomplished by bore and jack construction methods, thus further reducing impacts to the roads. Gravel roads are proposed to be crossed by open-cut methods.

Colorado Department of Transportation (CDOT)

General policies relating to utility construction within CDOT ROWs are presented below along with issues relating to SWSP II. CDOT requirements are bulleted.

General CDOT Utility Policies

- Utilities shall implement joint use design alternatives where the Department determines it is necessary or prudent for the safe and efficient use of the SH ROW, especially in developing areas subject to a proliferation of individual utility installations. When so directed by the Department, the permittee is responsible for proper coordination with other affected utilities. Joint use facilities shall comply with all applicable industry guidelines and standards.
- In the location and design of its facilities, utility owners shall consider the need to conserve space for the future accommodation of other utility facilities, anticipate future expansion requirements and, when feasible, install additional carrying capacity to meet such needs. Utility owners shall enter into joint use arrangements with other utilities whenever feasible, and shall design facilities so as to minimize interference with the operation or maintenance of other pre-existing utility facilities.
- The utility shall locate longitudinal installations on a reasonably uniform alignment as near as practical to the SH ROW line. Except as otherwise provided (in Section 3.3.1.4), the utility shall not locate longitudinal installations within median areas, traveled ways, shoulders, or under curbs or sidewalks.
- The utility shall locate a buried longitudinal installation not less than 15 feet beyond the edge of pavement or back of curb to avoid potential conflict with highway signs, guardrail, or other appurtenances.

The SH 119 ROW is restricted on the north side due to a recently installed fiber-optic line that is located at the center of the existing ROW (Figure 12). CDOT would not allow utilities within the SH 119 median between travel lanes. Due to the size and high pressure of the proposed SWSP II, it is necessary to provide 10 feet on either side of water line that is free from other utilities to prevent potential threats to the security of the line. With limited available ROW that could be solely dedicated to SWSP II, additional dedicated easement would be required outside of existing ROW.

Future CDOT Facilities

- The utility shall design its facilities to avoid unreasonable conflict with planned or programmed changes to existing highway facilities, as directed by the Department, so as to avoid such conflict.

CDOT has a project planned for the reconstruction of the SH 119/SH 52 interchange, and the waterline design will have to be compatible with this project's design. This will require acquisition of private easement significantly west of the existing SH 119 roadway in the vicinity of SH 52.

Construction Activities within CDOT ROW

- In all areas with design speeds of 45 MPH or greater, the AASHTO "Roadside Design Guide" shall be used to determine clear zone width.
- All excavations shall be closed at the end of daily operations, and no unattended open excavation will be allowed within the clear zone after dark.

The clear zone distance will determine the need for barriers during installation and maintenance of the facility. The clear zone for this stretch of roadway will be a minimum of 30 feet. This means that construction activities will need to be 30 feet off of the traveled surface unless concrete barriers are used.

Conclusion

The pipeline alignment that maximizes the use of the SH 119 ROW (Alternative 4) would require additional easement to allow construction access and maintain the necessary level of safety. The pipeline would need to be located in new easement adjacent to the SH 199 ROW. The requirements discussed above, combined with the nature of a large pressure water conduit traversing rural areas, mean that CDOT would unlikely grant approval for siting this line inside of the SH 119 ROW. It was concluded that the pipeline would be located outside of existing ROW in private easement, and that the ROW would be utilized as construction space, reducing the amount of disturbance outside of the ROW.

r. Existing Utilities and Infrastructure

Research on existing utility information was initiated by contacting the Utility Notification Center of Colorado (UNCC) to obtain a list of all utility companies, special districts, and/or municipalities that own or maintain facilities within the study area. Following is the list of existing utilities with facilities within the study area:

- City of Boulder Sewer and Water
- City of Boulder Fiber
- City of Longmont Electric and Traffic
- City of Longmont Water and Sewer
- ATT Transmission
- Comcast
- Encana Oil & Gas
- Ero Resources
- ICG Communications (Level 3)
- Level 3 Communications
- Kerr McGee
- Left Hand Water District
- MCI
- McLeod USA
- Merit Energy
- Niwot Sanitation District
- Northern Colorado Water Conservancy District

- Platte River Power Authority
- Poudre Valley Rural Electric
- Qwest Local Network/Communications
- Xcel Energy – gas and electric
- Xcel Energy – high pressure gas
- Paetec
- Unite FO

Each of these utilities was contacted to obtain the available mapping of their facilities within the study area for use in determining potential conflicts with the alignment alternatives.

Pipe Construction Considerations / Constraints

Construction of a large transmission pipeline involves:

- Excavation of a trench
- Stockpiling of trench soils
- Segregation of topsoil
- Installation of pipe
- Haul-in of select backfill material
- Haul-off of excess soil
- Compaction of trench material
- Final grading
- Restoration

These activities require a significant amount of heavy construction equipment, including multiple tracked backhoes, front-end loaders, dump trucks, dozers, welding trucks, and graders. Pipe laying is a linear operation and the pace of the construction depends, to a great extent, on the amount of space provided in which to work. The ability to stockpile soils adjacent to the trench and the ability of equipment to traverse ahead of and behind the open trench while staying within the work zone mitigates impacts to adjacent roadways by minimizing the entries and exits. It also allows the construction to progress at a reasonable pace, reducing the time that adjacent facilities, roadways, and the public are impacted by construction disturbance.

Based on past similar large diameter transmission pipeline construction projects, the estimated width of construction activity to efficiently construct this pipeline is approximately 80-90 feet. A series of cross-sections is presented in Appendix 2. Most of the pipeline alignments are adjacent to other linear facilities such as roads and existing easements. Available lands within these easements will be utilized for construction activities, and this will reduce the total width of permanent easement acquisition required.

Where encountering features such as existing structures and wetlands or when crossing creeks, this construction corridor has been reduced, for a short distance, to minimize impacts.

The SWSP II will be a major raw water transmission pipeline, and at various times of the year may be the primary water source for the project participants. Because of the critical supply nature of transmission mains (they are not part of a looped system typical of municipal distribution piping), they are typically constructed in environments that will maintain some amount of "clear zone" around the pipe. Reasons for this clear zone are summarized below.

Larger transmission lines are frequently constructed with welded-steel pipe. These pipes require a granular (sand/gravel) compacted backfill envelope around the pipe to provide side-support and allow the pipe to maintain its shape when loaded from above (by soil or vehicular traffic). Loss of this support can affect the structural integrity of the pipeline or surface settlement. To maintain this envelope, one would typically exclude excavation for a parallel utility within approximately 4 pipe diameters either side of the transmission pipeline. For the SWSP II pipeline, the desired clear zone would therefore be approximately 12 feet on each side of the pipe.

The SWSP II pipeline is anticipated to operate between approximately 180 and 240 psi. By comparison, most municipal distribution pipelines operate between 40 and 120 psi. Inadvertent damage to this line from other construction activities in a public ROW could result in a sudden, shutdown of the line, which would disrupt critical service to the WTPs. The static systems would automatically shut down the waterline in case of an emergency break; however, some damage to the surrounding area and infrastructure would likely occur. Maintaining the clear zone will mitigate against inadvertent damage from construction of adjacent utilities.

This clear zone also serves to allow maintenance activities on either the SWSP II line or adjacent utilities without negatively affecting each other.

3. ALTERNATIVE ROUTE DEVELOPMENT

Using the data discussed in Section 2, alternative routes were developed to achieve water deliveries to the LHWD Dodd WTP and the City of Boulder's Boulder Reservoir WTP. Areas of higher constraint were avoided whenever possible, including sensitive habitat areas, wetlands, open space, agricultural lands, urban uses, and other considerations. Also, the alternative alignments were developed to utilize existing corridors, such as roadways, railroads or railroad beds, canals, pipelines or existing utilities, and boundaries of land parcels where possible.

The resulting alternatives are shown in Map 8 and briefly described below.

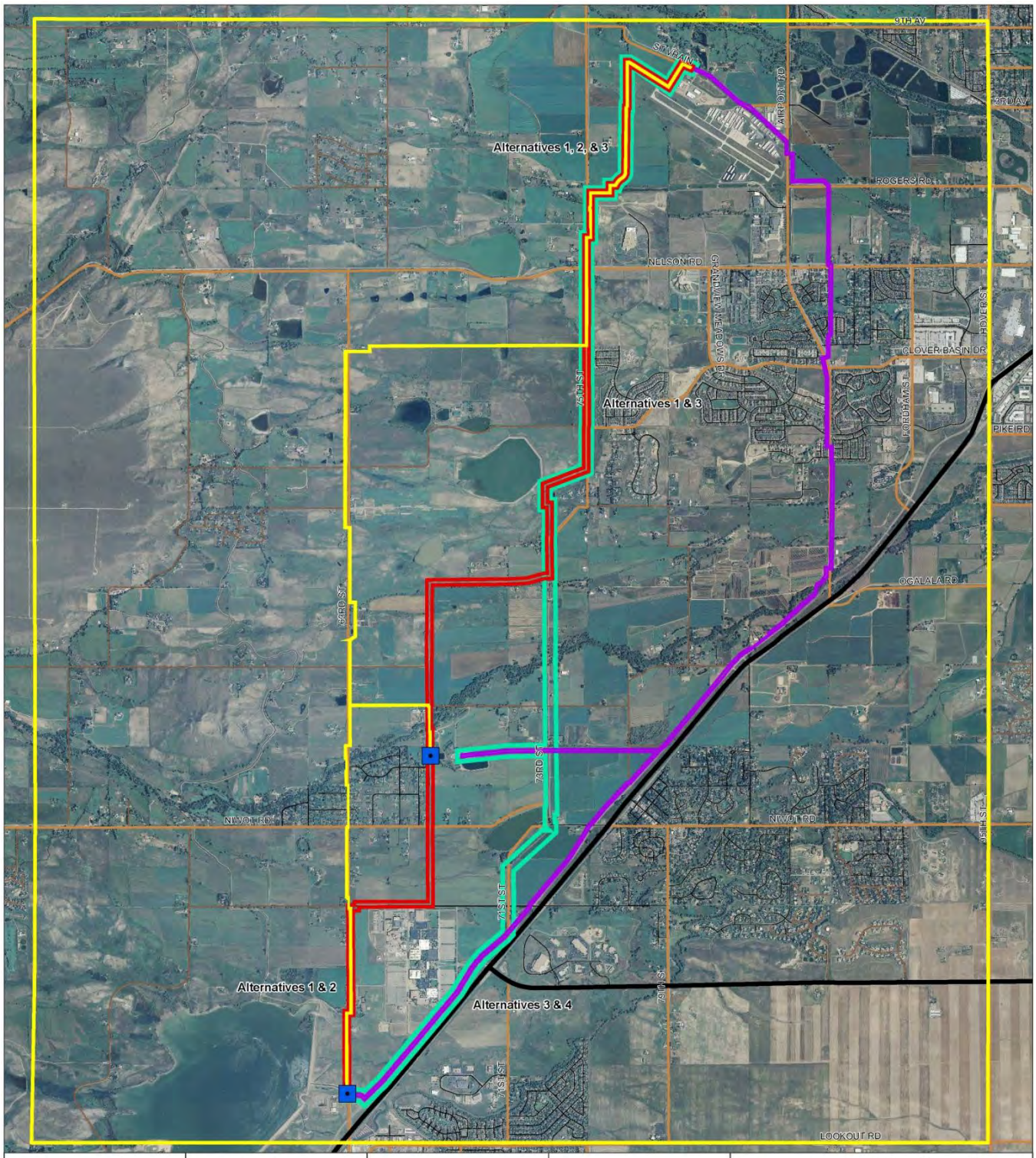
a. Alternative 1

This is the alternative alignment that was previously identified as the preferred alternative in a 1041 submittal made to Boulder County on May 13, 2009. All of the alternative alignments begin at the existing diversion structure at the St. Vrain Supply Canal near Carter Lake and run generally south to the Boulder County line, following the alignment of the existing SWSP pipeline. From Hygiene Road south to St. Vrain Road, the City of Longmont 36-inch diameter Clover Basin Pipeline is also proposed to parallel the existing SWSP pipeline within the existing easement. From the eastern turnout to St. Vrain Road, the existing permanent easement is 80 feet in width. This length of pipeline traverses generally open agricultural property along with a few residential acreages.

The Alternative 1 alignment diverges from the original pipeline alignment on the south side of St. Vrain Road, skirting the Longmont Vance Brand Municipal Airport and heading south for nearly a mile, and turning west on Rogers Road to the intersection with N. 75th. At 75th, the route turns south along the east side of the street and continues south for a distance of approximately 0.25 mile before crossing to the west side of the street. The pipeline route crosses Nelson Road and continues south across Dry Creek (north), James Ditch, Dry Creek, and Pike Road, to a point just east of Lagerman Reservoir.

Near Lagerman Reservoir, the route turns west and follows an alignment along Dry Creek North for a short distance before turning south and intersecting with N. 73rd Street. From this location, the alignment continues south along the east side of N. 73rd Street approximately 1,300 feet to the Holland Ditch. Here, the alignment turns west, crosses N. 73rd Street, and continues west along the north side of the Holland Ditch for approximately 4,000 feet. The alignment then turns due south for approximately 6,000 feet, crossing Nimbus Road and Left Hand Creek to the LHWD Dodd WTP. The alignment continues south to Monarch Road, where it turns west for 0.5 mile, turning south along N. 63rd for the remaining distance to the delivery point near Boulder Reservoir.

Map 8. Alternatives



Map Number and Title:	Project Title & Applicant:	Consultant:	Engineer:	September 22, 2010 0 0.25 0.5 Miles 1:12,000
Map: 8 **Title: Alternatives**	Southern Water Supply Project II NCWCD 220 Water Ave. Berthoud, CO 80513 (970) 532-7700	AECOM 240 East Mountain Ave. Fort Collins, CO 80524 (970) 484-6073	Integra Engineering 1095 South Monaco Parkway Denver, Colorado 80224 (303) 825-1802	Highways Major Roads Local Roads-Rural Local Roads-Urban Rail Lines Existing SWSP Pipeline Connection Point Alternative 1 (Original Proposed) Alternative 2 (Western) Alternative 3 (Central) Alternative 4 (Eastern/Hwy)

A series of figures are presented in Appendix 2 that show cross-sections for various segments of this and other route alternatives, each varying with site-specific conditions that are encountered at different locations along the way.

In addition, a series of figures are presented in Appendix 3 to illustrate representative and/or sensitive locations along the alignment. Figure 1 shows a location along N. 75th Street where the alignment was routed to avoid a windrow of trees adjacent to the street. Figure 2 shows the crossing of Left Hand Creek, and Figure 3 shows a segment of the alignment along 63rd Street on the west side of the IBM property.

b. Alternative 2

The alignment of this alternative is common with that of Alternative 1 for its northernmost portion, departing from a common alignment at a point on N. 75th Street near Silver Creek, where the alignment turns west for a distance of approximately 1.5 miles until it intersects with N. 63rd Street. The alignment follows 63rd Street for the remaining 4.5 mile distance to the delivery point near Boulder Reservoir, crossing from the west to the east side of the street where necessary to avoid conflicts with residences or trees. From Monarch Road to the southern terminus, Alternative 2 shares a common alignment with Alternative 1.

A series of figures are presented in Appendix 2 that show cross-sections for various segments of this and other route alternatives, each varying with site specific conditions that are encountered at different locations along the way.

In addition, a series of figures are presented in Appendix 3 to illustrate representative and/or sensitive locations along the alignment. Figure 1 shows a location along N. 75st Street where Alternatives 1 and 2 share a common alignment. Figure 2 shows the location where Alternatives 1 and 2 cross Left Hand Creek toward the Dodd WTP. Figure 4 shows the location where Alternative 2 crosses Left Hand Creek toward the Boulder Reservoir WTP.

c. Alternative 3

The alignment for this alternative is common with that of Alternative 1 for the northern half of their distance. Alternative 3 continues south along 73rd Street, rather than turning west near Holland Ditch like Alternative 1, until it reaches Dodd Reservoir, where it follows a diagonal alignment to 71st Street. Upon reaching SH 119, the alignment parallels the highway along its north side until turning west, crossing N. 63rd Street, and reaching the terminus near Boulder Reservoir.

A series of figures are presented in Appendix 2 that show cross-sections for various segments of this and other route alternatives, each varying with site-specific conditions that are encountered at different locations along the way.

In addition, a series of figures are presented in Appendix 3 to illustrate representative and/or sensitive locations along the alignment. Figure 5 shows a location along the alignment adjacent to N. 73rd Street and Figure 6 shows the crossing of Left Hand Creek at N. 73rd Street. Figure 7 shows a portion of the alignment where it would be adjacent to SH 119.

d. Alternative 4

Alternative 4 follows the alignment of the original SWSP pipeline through Longmont. From a point on the north side of Vance Brand Airport, this alignment initially follows St. Vrain Road and the Niwot Ditch to Airport Road. After crossing to the east side of Airport Road, the alignment continues south a short distance, turning east at the intersection with Rogers Road. The alignment continues east a short distance along the north side of Rogers Road until reaching Niwot Ditch, where it turns south crossing Nelson Road and Dry Creek. Near the crossing of Clover Basin Drive, the alignment re-joins Airport Road, which it parallels all the way to SH 119, crossing from the west side to the east side at a point where the existing SWSP pipeline turns to the east. From this point to the south, Alternative 4 would be within a new easement. After crossing Left Hand Creek and intersecting SH 119, the alignment continues along the north side of the highway for the remaining distance to the terminus near Boulder Reservoir.

A series of figures are presented in Appendix 2 that show cross-sections for various segments of this and other route alternatives, each varying with site-specific conditions that are encountered at different locations along the way.

Figures 8 and 9 show locations along the alignment of Alternative 4 where it would be located within a greenbelt within an existing subdivision. Figure 10 shows a location adjacent to Airport Road adjacent to condos. Figures 11 and 12 show a location adjacent to SH 119.

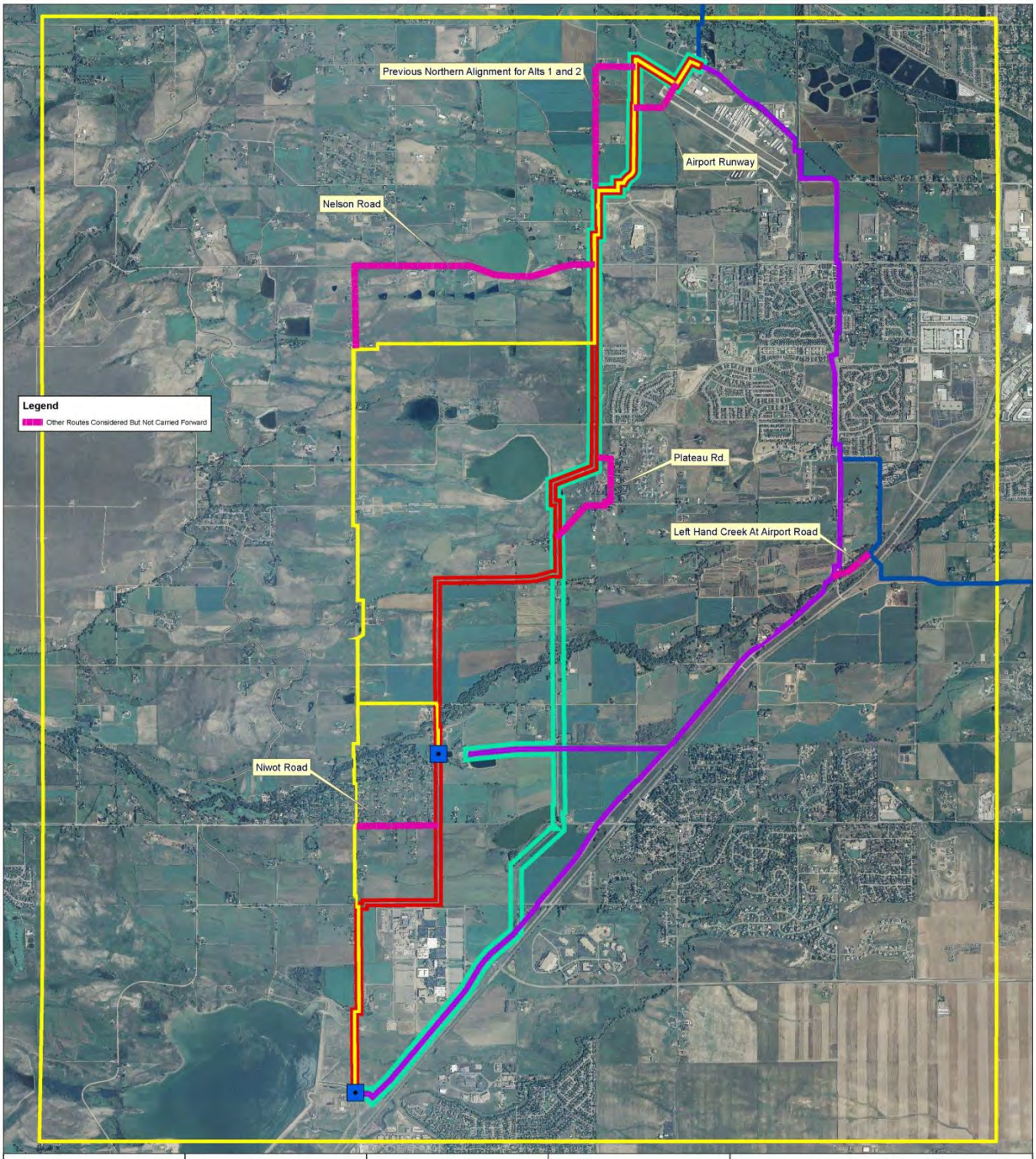
e. Alternatives Considered but Rejected

In addition to the routes previously described, a number of alternatives were initially considered but subsequently rejected following further evaluation. These alternatives are discussed below and shown in Map 9.

Longmont Airport/City of Longmont Clover Basin Pipeline

One potential pipeline route alternative investigated was an alignment that paralleled the City of Longmont's (COL) proposed Clover Basin Pipeline extension. This route continues south from St. Vrain Road along the western boundary of the Boulder County Transportation maintenance facility, crosses the Longmont (Vance Brand) Airport property (including crossing the existing taxi-way and runway), and continues nearly due south to Nelson Road. This alternative route was considered because it would provide for co-location of the SWSP II pipeline with the proposed COL Clover Basin Pipeline, therefore limiting the construction disturbance.

Map 9. Other Routes Considered



Map Number and Title:	Project Title & Applicant:	Consultant:	Engineer:	September 22, 2010 0 0.25 0.5 Miles 1:12,000
Map: 9 Title: Other Routes Considered	Southern Water Supply Project II NCWCD 220 Water Ave. Berthoud, CO 80513 (970) 532-7700	AECOM 240 East Mountain Ave. Fort Collins, CO 80524 (970) 484-6073	Integra Engineering 1095 South Monaco Parkway Denver, Colorado 80224 (303) 825-1802	Highways Major Roads Local Roads-Rural Local Roads-Urban Rail Lines Existing SWSP Pipeline Connection Point Alternative 1 (Original Proposed) Alternative 2 (Western) Alternative 3 (Central) Alternative 4 (Eastern/Hwy)

The largest concern with this alternative route is the crossing of the Longmont Airport property and the existing taxi-way and runway. In communications and meetings with the Longmont Airport manager (Tim Barth) and the Federal Aviation Administration (FAA) (Don O'Bryan), pipeline construction across the airport facilities would have to meet very strict requirements. Following is a list of issues:

- The Longmont Airport operates 24 hours a day, 365 days a year.
- The airport typically shuts down operations for maintenance for only 6-8 hour time periods, typically at night.
- Shutting down the airport or restricting the length of usable runway for the pipeline construction for a longer period of time would be an economic hardship for the airport due to the lost revenue of several businesses located at the airport.
- There are stringent FAA restrictions that would have to be met In order to keep the airport in operation during pipeline construction:
    - No excavation could be made within 250 feet of the centerline of the runway;
    - Any equipment and construction materials would have to be outside of this 250-foot restriction, and the height of the equipment would be restricted by a 7:1 slope from the 250-foot limit;
    - No excavation can be made within 200 feet of the end of the runway, and;
    - Any equipment and construction materials would have to be outside of this 200-foot restriction and then the height of the equipment would be restricted by a 34:1 slope from the 200-foot limit.

These restrictions limit the method of pipeline construction across the taxi-way and runway to some type of trenchless method. With the 250-foot restriction from the runway centerline and the proximity of the taxi-way to this limit, the length of trenchless construction would be approximately 600 feet. With a pipeline diameter of approximately 36-inches, the minimum casing diameter would be 48 inches. At a length of 600 feet and a diameter of 48 inches, typical auger boring methods are not feasible. This leaves conventional tunneling or utilization of a tunnel boring machine (TBM) as the feasible alternatives. Without the ability to obtain adequate geotechnical information within the 600-foot length, trenchless methods would be substantially higher risk. Both of these construction methods would be prohibitively expensive, with costs for the 600-foot installation approaching $1 million.

Not only does this alternative route present difficulties for the initial construction, it also is very undesirable for the operation and maintenance of a water pipeline. Maintenance or repairs within the airport safety zone would require temporary shutdown of the airport while the necessary work is performed. Operating a pipeline across an FAA regulated airport and facilities would greatly restrict Northern Water ability to access the pipeline for maintenance and repair.

For these reasons, it was determined that a pipeline route that crosses the Longmont Airport runway and taxi-way was not in the best interest of either Northern Water and the participants nor the Longmont Airport. Therefore, this alternative route was eliminated from further consideration.

Paralleling Niwot Road

One potential pipeline route alternative investigated was an alignment that would parallel Niwot Road from the intersection with N. 63rd Street approximately 2,700 feet to the east. This alternative route would eliminate the need to cross the Boulder County open space property between Monarch Road and Niwot Road.

In investigating this alternative route, there are several concerns:

- The Boulder County Transportation Department recently (within the last 3 years) completed a reconstruction and widening project on this portion of Niwot Road.
- Working in conjunction with the Boulder County Transportation Department, the LHWD was able to replace an older asbestos cement waterline with a new PVC waterline prior to the road construction along this length of Niwot Road. This new 18-inch diameter LHWD treated water pipeline is located adjacent to the south edge of the newly widened asphalt road section.
- The LHWD also has an existing 30-inch diameter raw water pipeline, which is located within easement adjacent to the south ROW line of Niwot Road along this length.
- In addition to these two LHWD water pipelines, there is also a small irrigation channel that parallels the road on the north side, an existing telephone line that parallels the road on the north side, an existing overhead power line along the north ROW line, an existing gas line within the asphalt roadway that jogs to the north and continues to parallel the road along the north side, and the abandoned LHWD waterline, also within the asphalt roadway.
- Many of the homeowners on both sides of Niwot Road along this length have fairly extensive landscaping, fences, and other improvements that are adjacent to the road ROW.

With all of the existing utilities within the ROW (both within the asphalt roadway and adjacent to the roadway) and the numerous adjacent private properties, this corridor is not feasible for the construction of a large diameter water transmission pipeline. The only options within this length would be to obtain private easement from the property owners along the south side of Niwot Road or to construct the pipeline within the newly reconstructed asphalt road surface. The private easement on the south side of the road would have to be located south of the LHWD existing easement, which would put the pipeline corridor very close to existing residences and would entail the amount of disturbance to the existing property improvements. Constructing within the asphalt road surface would encompass all of the traffic impacts (either from a road closure or one-lane traffic), impacts to the newly reconstructed roadway, multiple existing utility conflicts, and the requirement to overlay the entire road width.

For these reasons, it was determined that a pipeline route that parallels Niwot Road within this length was not a reasonable alternative. Therefore, this alternative route was eliminated from further consideration.

Diverging from the Existing SWSP Pipeline Easement from Airport Road to SH 119

One of the pipeline route alternatives (Alternative 4) for the SWSP II pipeline utilizes the existing SWSP pipeline easement from St. Vrain Road generally south through the City of Longmont. The existing SWSP

pipeline easement departs from the Airport Road corridor at the southern limits of the City of Longmont, and turns east for approximately 1,300 feet before turning south again to the existing Left Hand Creek and SH 119 crossing locations. The Alternative 4 alignment for the SWSP II pipeline diverges from the existing SWSP easement at the point where the existing pipeline turns east from Airport Road, with the proposed SWSP II pipeline alignment continuing south along Airport Road until just north of Left Hand Creek. At this location, the proposed alignment crosses to the west side of Airport Road, crosses Left Hand Creek, and then proceeds south and west along the SH 119 ROW (Figure 13).

The divergence from the existing SWSP pipeline easement, as shown for Alternative 4, is due to the existing configuration of the intersection of Airport Road and SH 119. The Boulder County Transportation project, which widened Airport Road to four lanes and replaced the bridge structure at Left Hand Creek, also included improvements to SH 119, including the addition of acceleration and deceleration lanes to Airport Road. If the Alternative 4 alignment continued following the existing SWSP easement to the SH 119 ROW and then followed the SH 119 ROW to the southwest, the new pipeline would have to traverse the Airport Road/SH 119 intersection.

At the immediate location of the Airport Road/SH 119 intersection, the channel of Left Hand Creek also meanders into the SH 119 ROW. In addition, there is a concrete trail/bike path that parallels the SH 119 roadway and crosses underneath the Airport Road bridge structure, basically within the limits of the Left Hand Creek flow channel. With the configuration of the Airport Road bridge structure over Left Hand Creek, the acceleration and deceleration lanes added to the SH 119 asphalt roadway, and the existing concrete trail/bike path, there is virtually no unoccupied space within the SH 119 ROW. ATT fiber-optic conduit also was installed by horizontal directional drilling (HDD) methods parallel to the SH 119 roadway, and there are existing conduits for the signalized intersection. This renders construction of a large diameter water transmission pipeline through this intersection infeasible. With the configuration of all of the improvements and the location of Left Hand Creek, the water transmission pipeline would have to be installed by some type of trenchless construction methods and basically be on an alignment that would put the pipeline underneath the acceleration and deceleration lanes of SH 119, an alignment that is not acceptable to CDOT. The length of the trenchless installation would be a minimum of 350 feet in length, nearing the limits of installation by typical horizontal auger boring methods in addition to the increased risk of this type of construction. The increased risk associated with this type of construction method includes tunnel collapse or getting stuck and losing the bit.

Paralleling the northwest ROW line of SH 119 within adjacent easement would result in two additional crossings of Left Hand Creek and substantial tree removal and impacts to the riparian habitat, also not a preferred alternative.

For these reasons, it was determined that the best route for Alternative 4 would be to diverge from the existing SWSP easement and parallel the Airport Road corridor south to the Left Hand Creek crossing and the SH 119 ROW as shown. By using this alignment, the improvements at the intersection of Airport Road and SH 119 are avoided, and there is only a single crossing of Left Hand Creek with limited impacts.

Paralleling Nelson Road from N. 75th Street to N. 63rd Street

One potential pipeline route alternative investigated was an alignment that would parallel Nelson Road from the intersection with N. 75th Street west to N. 63rd Street for the Alternative 3 alignment.

In investigating this alternative route, the biggest concern is the proximity of the Clover Basin Reservoir along the north side of Nelson Road. This existing reservoir eliminates the potential to parallel the north side of Nelson Road within the extent of the reservoir. In addition, there are several properties along the south side of Nelson Road that have significant improvements immediately adjacent to the road ROW. A further concern is that Nelson Road carries a significant amount of traffic, with an average annual daily traffic (AADT) count ranging from 4,071-5,340 for the segment between N. 75th Street and N. 63rd Street. For these reasons, this alternative route was eliminated from further consideration for the Alternative 3 alignment.

Paralleling N. 75th Street through the Jog Over to N. 73rd Street at Plateau Road

Another potential routing that was considered was to continue paralleling N. 75th Street as it jogs to the west at Plateau Road and becomes N. 73rd Street. Between Clover Basin Drive and Plateau Road, a large number of mature trees and two residential structures are on the east side of the road. On the west side of the road, there are two residences with significant landscaping and one very large mature cottonwood tree. Continuing to abut the road in this location would eliminate a high number of trees for the short distance traversed, as well as very negatively impact residences and residential landscape.

4. DEVELOP EVALUATION CRITERIA AND RANK

Based on an understanding of the project area and consultation with Boulder County, a series of evaluation criteria was defined. These criteria are shown in Table 1. Table 1 also displays the results of applying these criteria to each of the alternatives. The evaluation criteria reflect land use and resource conditions that merit consideration in comparing alternative routes and the advantages and disadvantages associated with each.

a. Route Evaluation Criteria

Water Features

Number of crossings/length:

- Perennial streams
- Intermittent streams
- Ditches/canals

Vegetation

Distance through:

- Wetlands/riparian areas
- Areas with potential for sensitive plant occurrence
- Number of trees removed

Wildlife

Distance through:

- Designated important/critical habitat
- Prairie dog towns
- Designated buffer zone of raptor nest

Open Space

Distance through:

- Open space
- Lands with conservation easements

Land Use

- Number of homes within 100 feet
- Distance requiring new ROW
- Distance in conflict with planned land uses

Agricultural Lands

Distance through lands of:

- National importance
- State importance
- Local importance

Transportation

Distance with potential for adverse effects on traffic:

- State and Federal highways
- Major arterials
- Secondary roadways

Engineering

- Total length

Table 1. Route Evaluation Criteria

Category	Alternative 1 (Original Proposal)	Alternative 2 (Western Route)	Alternative 3 (Central Route)	Alternative 4 (Eastern/Hwy Route)
Impact Ranking				
Water Features				
Perennial Streams				
number of crossings	3	3	3	3
Intermittent Streams				
number of crossings	2	7	2	1
Vegetation				
Wetlands				
area (acres)	1.9	3.5	1.7	1.1
Significant Natural Communities (Great Plains Salt Meadow)	-	-	-	-
Trees Removed				
Native Trees (cottonwood and coyote willow and peachleaf willow)	17	21	43	23
Landscape Trees	40	81	80	286
Exotic (Russian olive, Siberian elm, etc.)	70	93	11	23
Wildlife				
Critical Wildlife Habitat (Boulder Co)				
(number of crossings)	1	2	1	-
State and Federal T & E Habitat (PCAs)				
area (acres)	-	-	-	-
Riparian Forest				
(acres)	0.7	1.3	0.5	0.3
Raptor Nests				
Number of Nests within 100 ft.	3	3	2	-
Open Space				
Open Space				
length (miles)	2.8	2.4	2.0	2.2
Conservation Easements				
length (miles)	1.2	0.4	0.7	1.3
Total Distance (miles)	4.0	2.8	2.7	3.5
Land Use				
Number of Parcels Crossed	32	44	36	60
Number of Residences within 100 ft.	13	27	9	82
Number of Commercial Buildings within 100 ft.	6	8	4	18
Total Area of new easement (ac)	75.0	79.0	69.0	43.5

Category	Alternative 1 (Original Proposal)	Alternative 2 (Western Route)	Alternative 3 (Central Route)	Alternative 4 (Eastern/Hwy Route)
Agriculture				
Significant Agricultural Lands In Cultivation (unless noted, all ag lands crossed are flood irrigated)				
National (acres)	**14.4**	**7.4**	**17.4**	**19.3**
State (acres)	**15.3**	**36.4**	**12.0**	**9.4**
Local (acres)	**-**	**-**	**0.5**	**-**
Overall (acres)	**29.7**	**43.8**	**29.9**	**28.7**
Transportation				
State Highway				
number of crossings	**-**	**-**	**-**	**-**
length of parallel (miles)	**-**	**-**	**1.4**	**4.2**
Major Arterials				
number of crossings	**7**	**8**	**8**	**10**
length of parallel (miles)	**4.4**	**6.2**	**3.1**	**1.6**
County Road (paved)				
number of crossings	**1**	**4**	**2**	**7**
length of parallel (miles)	**-**	**-**	**0.4**	**0.7**
County Road (unpaved)				
number of crossings	**3.0**	**5.0**	**2.0**	**4**
Utilities				
Conflict Rating (see Sec. 4)				
Constructibility	**Easy**	**Isolated Difficulties**	**Isolated Difficulties**	**Difficult**

b. Alternative Ranking Results

The results of applying these criteria to each alternative route are displayed in Table 1. A summary of these results is provided below. Table 1 provides a tabulation of the occurrence of each of the evaluation criteria for each alternative, or a measurement using an appropriate metric, e.g. length, number of acres, etc.

Given the relatively similar length of each alternative (8.6-9.7 miles) and somewhat homogeneous nature of the project area, dramatic differences do not emerge in the ranking of alternatives. However, there are clear distinctions within certain evaluation categories. Based on a full analysis of these rankings and distinctions, Alternative 1 is the preferred alternative.

Alternative 1

This alternative has numerous advantages and few disadvantages, which include:

- Lower number of native trees removed, including lowest number of landscape trees.
- Lowest number of parcels crossed
- Lower number of residences within 100 feet
- Lower level of disturbance to agricultural lands, including lands of national importance
- Lowest level of transportation effects
- A crossing of Left Hand Creek at a location that will minimize removal of cottonwoods and other riparian trees
- Lowest degree of conflict with existing utilities

Disadvantages of this alternative include:

- Greatest distance through open space.
- One of two alternatives with 3 raptor nests within 100 feet. This conflict will be mitigated by seasonal avoidance.

Alternative 2 (Western)

This alternative has relatively few advantages and several notable disadvantages Advantages of this alternative include:

- Least disturbance to agricultural land of national importance.

Disadvantages of this alternative include:

- Highest number of intermittent stream crossings
- Highest amount of wetland disturbance
- Two crossings of critical wildlife habitat
- Highest amount of crossing through riparian forest
- Highest amount of new easement required
- Highest overall level of disturbance to agricultural lands
- Highest level of transportation effects

Alternative 3 (Central)

This alternative falls in the mid-range for most criteria. Advantages of this alternative include:

- Lower distance through open space areas, including both areas with conservation easements and areas owned fee simple by local governments
- Least number of residences within 100 feet of the alignment
- Lowest amount of riparian vegetation disturbed

Disadvantages of this alternative include:

- Highest number of native riparian trees would be removed
- Some isolated construction difficulties, such as along 73rd Street at Left Hand Creek and adjacent residences
- Although mid-range in total agricultural land crossed, County staff report that these lands are some of the highest value lands in the project area

Alternative 4 (Eastern)

This alternative has several advantages as well as distinct disadvantages. Advantages of this alternative include:

- Lowest amount of wetland
- Lower amount of riparian vegetation disturbed
- Lowest amount of agricultural land disturbed

Disadvantages of this alternative include:

- Highest number of landscape trees removed
- Highest level of land use conflicts, including number of residence within 100 feet, total number of parcels crossed, and number of commercial uses within 100 feet that would be disrupted by construction activities
- Highest level of transportation effects due to over 4 miles of construction adjacent to SH 119 and the highest number of crossings of major arterials and paved county roads.
- Highest degree of conflict with existing utilities

The remainder of this section provides a more detailed discussion of each alternative and how it meets or conflicts with or each of the evaluation criteria.

c. Water Features

Crossing a drainage involves some degree of disturbance to aquatic habitat, temporary effects on water quality, and other impacts to vegetation and terrestrial habitat. With most drainages trending west to east, a north to south pipeline alignment inevitably encounters a number of natural drainages. This evaluation criterion was developed to determine if distinctions among the alternatives could be identified with respect to their effect on water features.

The largest perennial stream crossed is Left Hand Creek, which is crossed by all four alternatives. Note that the crossing of the St. Vrain River occurs north of the point where the alternative alignments diverge and this point is shared by all four alternatives. It is not considered within this alternative route evaluation.

Construction will be avoided at crossings of major streams and wetlands during the season of highest flow or water levels, generally late spring/early summer (April 1-July 1). Stream banks and drainage channels will be stabilized after construction, using mulch, fabric, netting or other applications to achieve slope stability. With restoration, impacts on drainage channels will be short term.

A summary of drainage crossings by alternative is provided below. *All figures referred to are found in Appendix 3.*

Alternative 1

This alternative crosses three perennial drainages and two that are intermittent. The crossing of Left Hand Creek occurs at a point where the riparian corridor narrows. As a result, few if any native trees would need to be removed at this location. Figure 2 provides a view of this crossing point. In addition, Alternative 1 crosses Dry Creek north and Dry Creek south below Boulder Reservoir. Although classed as perennial drainages, both of these drainages are narrow and should be considered a minor drainage crossing. In addition, this alternative crosses two intermittent drainages, including Clover Basin Creek and Silver Creek. Both of these drainages are narrow and minor

Alternative 2

This alternative has three perennial drainage crossings, including Left Hand Creek adjacent to N. 63rd Street where the crossing is constrained by the existing easement and the mature cottonwood trees adjacent to the N. 63rd St. Bridge. Figure 4 provides a view of the crossing point. In addition, it would also cross Left Hand Creek with a smaller pipeline to the delivery point for the Left Hand Water District. This secondary crossing of Left Hand Creek is at the same crossing location as Alternative 1 and few trees, if any, would be impacted. Alternative 2 also crosses Dry Creek below Boulder Reservoir. Alternative 2 also crosses Clover Basin Creek, Silver Creek, and some un-named minor drainages. These drainages contain wetland vegetation, mainly a combination of sedges and rushes with cattail and bulrush in the larger drainages such as Dry Creek below Boulder Reservoir.

Alternative 3

This alternative has three perennial drainage crossings. It crosses Left Hand Creek, Dry Creek north adjacent to N. 73rd Street, and Dry Creek south near Boulder Reservoir. Figure 6 provides a view of the crossing point. The Left Hand Crossing contains mature cottonwood trees adjacent to the N. 73rd Street Bridge that would be impacted. The Dry Creek crossing is the same as Alternative 1, which impacts species such as inland saltgrass (*Distichlis spicata*) and seepweed (Sueada sp.) at the saline wetlands downstream of Lagerman Reservoir. In addition, Alternative 3 crosses Clover Basin and Silver Creeks. These two drainages mostly consist of sedges and rushes found in most of the wetlands throughout the area.

Alternative 4

Alternative 4 has the fewest drainage crossings. The Left Hand Creek crossing point avoids numerous existing improvements at the Airport Road and SH 119 intersection. Alternative 4 would cross the future drainage alignment of Lykins Gulch (currently under construction) near the intersection of Airport Road and Rogers Road. The crossing at Left Hand Creek adjacent to Airport Road and SH 119 would impact several cottonwoods and Russian olive trees. Figure 11 provides a view of this crossing point. Mature cottonwoods would also be impacted at the crossing of Dry Creek south of Nelson Road. Due to the more urbanized location of Alternative 4, it has only one crossing of an intermittent drainage.

Table 2. Water Features

Water Features	Alternative 1 (Original)	Alternative 2 (Western)	Alternative 3 (Central)	Alternative 4 (Eastern)
Left Hand Creek (perennial)	X	X	X	X
Clover Basin Creek (intermittent)	X	X	X	
Dry Creek north (perennial)	X		X	X
Dry Creek north (intermittent), upstream of Left Hand Reservoir		X		
Lykins Gulch (intermittent)				X
Silver Creek (intermittent)	X	X	X	
Un-named Tributaries		X		
Dry Creek south (perennial), downstream of Boulder Reservoir	X	X	X	X

d. Wetlands

Impacts to wetlands range from 1.1 acres for Alternative 4 to 3.5 acres for Alternative 2. The wetlands affected by alternative pipeline routes consist mostly of emergent freshwater marsh, ranging from dense cattails to short sedges and rushes to coyote willow. Although subtle differences in vegetation type can be identified, most wetlands crossed have similar characteristics and are associated with minor drainages that support a narrow band of wetland vegetation along their margins. Pipeline construction will have a short term impact on wetland vegetation. With restoration, these areas will return to a similar condition that existed prior to construction. Specific conditions along each alternative are discussed below.

Alternative 1

Alternative 1 would impact a total of 1.9 acres of wetlands. The first wetland crossed is the Clover Basin Ditch, just before the alignment heads south. Other wetlands crossed include the Davis and Downing Ditch, Clover Basin Creek, and Silver Creek along 75th Street. Alternative 1 crosses an alkali wetland at Dry Creek, downstream of Lagerman Reservoir, where high ground water elevates saline conditions and creates conditions suitable for saltgrass and sueda. Alternative 1 crosses wetlands associated with the Holland Ditch at the top of the hill on the Imel open space, and then the Williamson Ditch just south of the LHWD baseball fields. North of Monarch, Alternative 1 crosses wetlands along the Hinman Ditch, and as the route turns south it crosses the Star Ditch. The outlet for Coot Lake and Dry Creek also

contain wetlands and are crossed by Alternative 1 route. The larger ditches and more perennial water features tend to contain cattails, such as the Clover Basin Ditch, Holland Ditch, Dry Creek. The other wetland crossings generally consist of a mixture or rushes and sedges.

Alternative 2

Like Alternative 1, Alternative 2 crosses the same wetlands until Silver Creek where the route heads west and crosses Silver Creek twice as it heads towards 63rd Street. Other wetlands crossed along 63rd Street include Williamson Ditch, Hinman Ditch, Star Ditch, Coot Lake outlet, and Dry Creek. Most of the wetlands consist of sedge and rush wetlands, with the exception of the cattail wetlands described above. Alternative 2 would affect a total of 3.5 acres.

Alternative 3

Alternative 3 crosses the Clover Basin Ditch, Davis and Downing Ditch, Clover Basin Creek, Silver Creek, Dry Creek, Holland Ditch, Williamson Ditch, and Raywood Ditch along 75th Street. Alternative 3 also crosses a number of small wetlands along SH 119 near Dry Creek as it connects with the terminus at Boulder Reservoir. Alternative 3 affects 1.7 acres of wetlands.

Alternative 4

Alternative 4 crosses wetlands at Niwot Ditch, Peck Ditch South Branch, Dry Creek, Holland Ditch, Peck Lateral, and Left Hand Creek. All of these wetland features include a combination of sedges, cattails, and willows. Alternative 4 crosses wetlands at Williamson Ditch, Raywood Ditch, and Dry Creek along SH 119, affecting a total of 1.1 acres.

e. Significant Natural Communities

No significant natural communities designated by Boulder County are crossed by any of the alternatives. Known occurrences of rare plants are shown in Map 2. None of the alternatives would directly affect these areas. Alternative 1, the preferred alignment, was previously surveyed for rare plants, including Ute ladies' tresses orchid and Bell's Twinpod. No plants were found.

f. Trees

Trees are located throughout the study area and include large cottonwoods over 100 years old to newly planted landscape trees. Trees are a community asset and provide wildlife habitat, aesthetics, shade, and oxygen. A summary of the trees inventoried for each of the alternatives is provided below.

Table 3. Trees within Easement

Trees within Easement	Alternative 1 (Original)	Alternative 2 (Western)	Alternative 3 (Central)	Alternative 4 (Eastern)
Native Riparian Trees (cottonwoods and coyote willows and peachleaf)	17	21	43	23
Landscape Trees	40	81	80	286
Subtotal	57	102	123	309
Exotic (Russian olive, Siberian elm, etc.)	70	93	11	23

Alternative 1 results in the lowest number of trees removed while Alternative 4 has the highest. Alternatives 2 and 3 are mid-range. Alternative 4 impacts the greatest number of landscape trees at 286 trees, mostly located within the City of Longmont. Alternative 3 impacts the highest number of native trees at 43 individuals.

Alternative 1 crosses Left Hand Creek in an area that has a heavy canopy of narrowleaf cottonwood. However, there is a large gap between the trees and enough room to operate equipment between the trees. Only one small cottonwood may be impacted. In areas where large trees are avoided, soil disturbing activities that cut through large roots could potentially destabilize the structural stability of a tree and make in more susceptible to wind fall. Unlike single trees or a windrow of trees, the cottonwood in Left Hand Creek may provide some protection for each other in the case of high winds, by acting as a shelter to help deflect the wind.

g. Wildlife

Important habitat information, including Boulder County designated critical habitat, CNHP areas, and other important habitat areas are shown in Map 4. Most of these areas are avoided by the alternative routes. Alternative 3 crosses for a distance of approximately 1,000 feet an area on Left Hand Creek that is designated by Boulder County as Critical Wildlife Habitat. This crossing occurs near the middle of the designated area but at a location adjacent to a major road. Alternative 1 also crosses this area, but at a location near or just outside the edge of the critical habitat designation. Disturbances at both locations would be temporary. Similarly, Alternative 2 crosses along the edge of a critical habitat area west of Lagerman Reservoir. CDOW shows occupied PMJM habitat where Alternatives 1, 2, and 3 cross the Clover Basin Ditch. Although there has been one successful PMJM trapping effort approximately 0.8 miles upstream along St. Vrain Creek, two additional PMJM trapping efforts occurred 0.5 miles upstream that did not result in the presence of PMJM. A habitat assessment was performed for the project, and the USFWS concurred with our findings that the project does not cross any occupied PMJM habitat. No other areas crossed are considered to be important habitat for state or federally listed threatened and endangered species.

With respect to riparian habitat disturbance, Alternative 4 has the least amount of disturbance with .3 acre, followed closely by Alternative 3 with .5 acre and Alternative 1 with .7 acre. Alternative 2 is highest at 1.3 acres.

Alternatives 1 and 2 are located within 100 feet of three known raptor nests and Alternative 3 is located within 100 feet of two raptor nests. Alternative 4 is not located within 100 feet of any known nest sites.

The status of these nests will be determined prior to construction and the timing of construction will account for potential disturbance to these nest sites.

Coot Lake at the Boulder Reservoir Open Space and surrounding properties comprise the largest polygon of prairie dog colony mapped. This colony or congregation of colonies is crossed by Alternatives 1 and 2. Alternative 4 crosses the fewest number and area of prairie dog colonies. Alternatives 1 and 3 cross the largest number of previously unmapped prairie dog colonies within the study area. These areas were studied more closely as part of the detailed study for the 1041 submittal, although the number of prairie dog colony occurrences does not reflect size or population of colony. Population sizes and densities were not studied.

Overall, each of the alternatives has a similar level of effect on wildlife.

h. Open Space

All of the alternatives cross through open space properties, with the total distance crossed ranging from 2.7-4.0 miles. Alternative 3 has the least distance through open space, considering conservation easements as well as open space properties, while Alternative 1 has the most. At most locations where open space is crossed the pipeline alignment follows a road or land edge to minimize both short and long-term effects.

Specific open space properties crossed by each alternative are shown in Table 4.

Table 4. Open Space Crossed

Open Space Crossed	Alternative 1 (Original)	Alternative 2 (Western)	Alternative 3 (Central)	Alternative 4 (Eastern)
Warner County OS	X	X		
Suitts County/City OS	X	X	X	
Lagerman Reservoir County OS		X	X	
Ahi Longmont Farms County OS		X		
Imel County/City OS	X	X		
Hygiene Dairy County OS		X	X	
Bishop County OS		X		
IBM County/City OS	X		X	
Dodd Farms County OS			X	X
Jay Road Church of Christ County OS				X

A summary of the conservation easements crossed by each alternative is provided below.

Table 5. Conservation Easements Crossed

Conservation Easements Crossed	Alternative 1 (Original)	Alternative 2 (Western)	Alternative 3 (Central)	Alternative 4 (Eastern)
Warner	X	X	X	
Coyote Ridge Non-Urban Planned Unit Development (NUPUD)	X	X	X	
Alpenglow Acres NUPUD	X			
Goose Point Ranch NUPUD	X			
Lynch	X			
Spicer Heights, NUPUD		X		

Heil NUPUD			X	
Haas NUPUD				X
Kanemoto Estates NUPUD				X
Imhoff				X
Nygren				X

i. Parcels

Parcel spatial data obtained from Boulder County was used to determine the number of parcels crossed by each route alternative. Alternative 4, which is located in a more urbanized setting, has the highest number of parcels crossed with a total of 60. Alternative 1 has the lowest number of parcels crossed (32), followed by Alternative 3 (36). Alternative 2 is slightly higher at 44.

The number of parcels crossed is one indication of potential land use conflicts, given that the pipeline would be located within an easement with restrictions on buildings and plant materials that can be used. In addition, the more parcels crossed generally equates to crossing smaller parcels. Crossing smaller parcels generally creates a higher level of impact on a property owner, since a smaller percentage would be unrestricted for other uses.

j. Residential and Commercial Uses

Data for residences and commercial businesses were collected along each of the proposed easement alternatives through the use of aerial photographs and field verification. All houses and businesses within 100 feet of each alternative were counted. Out-buildings and abandoned homes were not included in this analysis. Houses and businesses within 100 feet of the pipeline construction would have the highest level of disruption from noise, dust, vibration, and traffic congestion. Also, residential and commercial properties may be affected by easement restrictions, which limit buildings and plant materials.

Alternative 4 has the highest number of residences within 100 feet (82) and commercial buildings (18). The great majority of these buildings are located within an urbanized area of the City of Longmont located south of Nelson Road and generally in the vicinity of Airport Road.

Alternative 3 has the lowest number of residences within 100 feet (9), followed by Alternative 1 with 13 and Alternative 2 with 27.

A smaller number of commercial buildings and uses are located within 100 feet, with the total ranging from 4 for Alternative 3 to 18 for Alternative 4. Alternatives 1 and 2 are mid-range at 6 and 8, respectively.

An additional indication of overall land use effects is provided by the total amount of new easement required for each alternative. The amount of easement required is a function both of route length and the distance adjacent to existing rights-of-way where a shared easement can reduce the amount of new easement required. Information on easement widths is provided in Appendix 2, which presents cross-sections for various route segments along each of the alternatives. Because of the amount of distance within the easement of the existing SWSP pipeline and a reduced easement width along SH 119,

Alternative 4 requires the least amount of new easement at 43.5 acres. The next lowest is Alternative 3 (69 acres) followed by Alternatives 1 and 2 at 75 and 79 acres, respectively.

k. Significant Agricultural Lands

Three alternatives, 1, 3 and 4, disturb a very similar amount of agricultural land. Alternative 4 disturbs the least amount of agricultural land (28.7acres) followed closely by Alternative 1 (29.7 acres) and Alternative 3 (29.9 acres). Alternative 2 disturbs the highest amount at approximately 44 acres. As discussed in Section 2, significant agricultural lands include lands of national, state and local importance. All of these lands are irrigated and the great majority is flood irrigated. Only Alternative 2 would cross lands that are irrigated using a center pivot system. This dataset was provided by Boulder County and is illustrated on Map 6. Each category of agricultural lands is discussed further below.

National Importance

These are the highest value agricultural lands within the project area. Alternative 2 disturbs the least amount of lands within this category (7.4 acres). Alternative 1 is the next lowest (14.4 acres) followed by Alternative 3 with 17.4 acres. Alternative 4 is the highest at 19.3 acres.

Statewide Importance

Although low in the national importance category, Alternative 2 disturbs the highest amount of lands classified as having statewide importance, a total of 36.4 acres. Alternative 1 is the next highest at 15.3 acres followed by Alternative 3 with 12 acres. Alternative 4 has the least amount of lands in this category, a total of 9.4 acres.

Local Importance

Very little of this land category is crossed by any of the alternatives. Alternative 3 disturbs approximately .5 acre of this category and all the other alternatives avoid these lands altogether.

Rob Alexander, Boulder County Parks and Open Space, stated that the agricultural fields at the southern end of Alternative 3, near 81st Street and Oxford Road, are some of the most productive agricultural lands in the study area. Agricultural productivity is based on soil fertility and other soil characteristics, as well as the availability of developed irrigation water.

Although specific field conditions will dictate final design and a specific alignment, the area of disturbance was calculated for each alternative using a typical cross-section. This represents a typical condition where the pipeline would be located parallel to or adjacent to a county road. A permanent easement of 75 feet would also be acquired at most locations. Table 6 estimates the acreage disturbed and permanent easement for each of the alternatives.

In some locations obstacles or other site specific factors would require a narrowing of both the zone of disturbance and width of the permanent easement to 35 feet. These special situations were not accounted for in the estimates shown in Table 6.

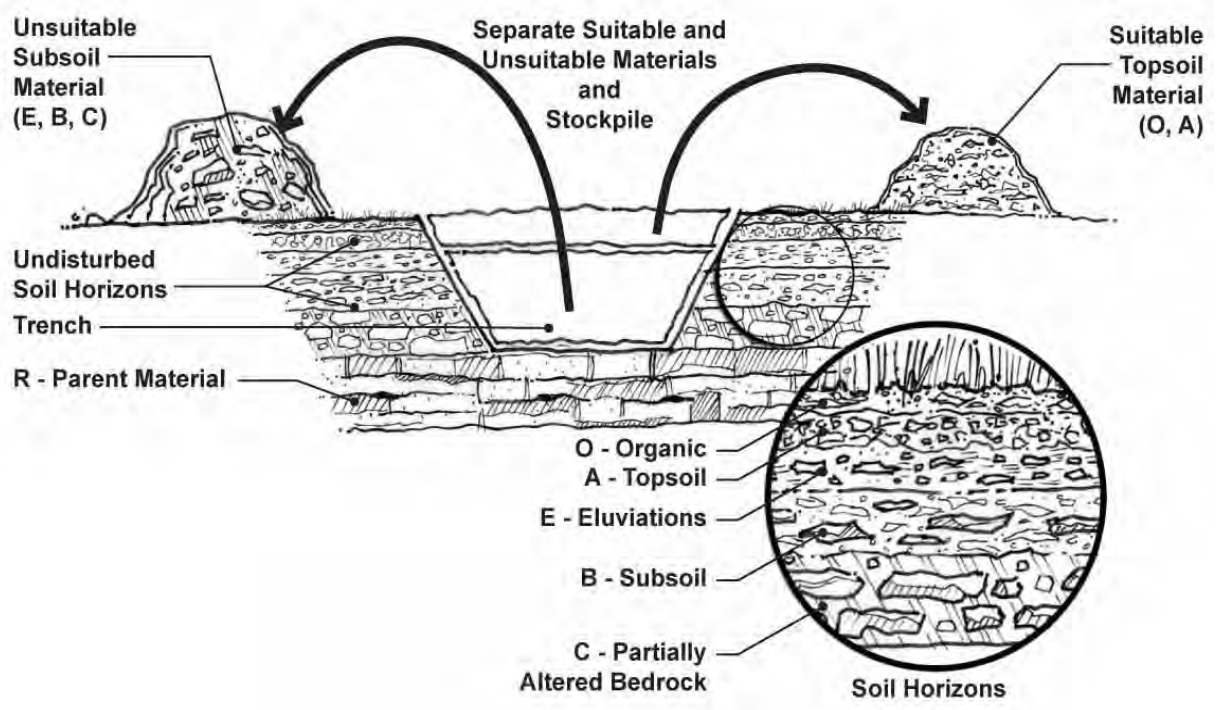
Table 6. Acreages of Irrigated, Agricultural Land Disturbed by each Alternative

	National Importance	State Importance	Local Importance	Total
Alternative 1	14.4	15.3	0	29.7
Alternative 2	7.4	36.4	0	43.8
Alternative 3	17.4	12.0	.5	29.9
Alternative 4	19.3	9.4	0	28.7

Construction across significant agricultural lands disrupts use of the land until restoration is completed. NCWCD will work with landowners to schedule construction activities at times that have less impact on production. However, it is likely that production will be affected at some locations during the construction phase of the project. NCWCD will compensate landowners for any lost income.

Northern Water met with Rob Alexander, Boulder County Parks and Open Space, on May 7, 2010 to review segments of the pipeline that cross agricultural lands. Issues identified by Mr. Alexander were soil inversion and damage to soil structure. In addition, the disruption to flood irrigation and the damage to drain tiles were also identified as key considerations during construction and remediation efforts.

Pipeline construction requires the excavation of soil. Soil is comprised of various layers that range from topsoil to subsoil to rock. Typical soil consists of O (organic – leaf litter and humus), A Horizon (topsoil - mineral plus organic humus), E Horizon (eluviations – mostly sand and silts with dissolved minerals and clays leached), B Horizon (subsoil – accumulation of clay), C Horizon (partially altered bedrock), and unweathered rock. When these layers become disturbed or mixed, the subsoil (which may contain higher concentrations of undesirable soil characteristics, such as extreme pH, toxic minerals, salt concentrations, etc.) could contaminate the soil at the surface, making it difficult or impossible to restore. Without careful handling of soil materials, construction activities and excavation can result in a mixing of the layers. Mr. Alexander stressed the importance of preserving the horizons as much as possible by segregating the topsoil and other suitable soil from the subsoil. Northern Water is committed to successful restoration of the SWSP II project area and plans to segregate soil layers as they are excavated, and stockpiling and returning it in the order it was removed. Soil horizon mixing is also minimized by leaving as much soil in place as possible. By only excavating soil within the pipeline trench (likely limited to 30 feet in width), the soil horizons in the remaining work area will remain intact. In areas where soil is disturbed, topsoil will be specifically segregated, temporarily stockpiled, and replaced. A restoration plan will be developed for each parcel, with input and approval from each landowner. As part of the restoration plan, natural soil amendments may be used to help enhance the condition of the soil as well as the growth and development of the vegetation. This may include the use of techniques and/or products such as organic matter, organic fertilizers, water infiltration enhancers, microbial inoculants (mycorhizae and rhizobia), and the use of legumes to help fix nitrogen.



In addition, soil particles bind together in aggregates or pedons that make up the soil structure. Soil structure influences the infiltration of water, the exchange of gases, and the penetration of roots. Soil structure is developed over hundreds to thousands of years and once disturbed through mechanical means, the soil structure is destroyed. However, to minimize the loss of soil structure, construction while the soil is dry will help prevent the total collapse of this structure. Although plowing and discing soil is a common agricultural practice, it is generally performed during the dry season to minimize compaction and minimize impact to soil structure. Northern Water has agreed to minimize the working of soil during wet conditions.

Compaction is common when using equipment on soil, especially with vehicles with tires. Vehicles with tires generally place higher pressure on smaller areas compared to tracked vehicles, which distribute their weight over a larger area. Compaction can be alleviated to a certain extent through the use of deep ripper teeth or a subsoiler to break up deeply compacted soil. Discs can be used to break up more shallow compaction and large clods.

Most agricultural fields crossed by the pipeline route alternatives are flood irrigated, fed from ditches that drain across the field downslope. The slopes of flood irrigated fields have been fine tuned over decades to ensure even spread of the water across the field. Excavation across the slope contour can disrupt these elevations and disrupt flood irrigation practices. Even with precise grading, soil settling can appear years later and disrupt irrigation efficiency. Northern Water is committed to ensuring that flood irrigated fields are restored to pre-construction conditions. In addition, Northern Water will return (as needed) following construction to make adjustments to the surface contours. Northern Water is also committed to preserving and/or repairing any drain tiles that are encountered during the course of pipeline installation. Drain tiles are important in flood irrigation to maintain the correct

moisture level so that supersaturated or inundated conditions that are detrimental to plants are avoided.

l. Transportation Impacts

Generally, the pipeline will be located in private easement abutting the existing road ROWs. Discussions with CDOT, City of Longmont, and Boulder County indicate there would likely be reduced speed limits through the work zone and potentially single lane closures and/or flaggers to facilitate trucks and other equipment from the roadway into and out of the work zone. Construction within road ROW, particularly construction within the paved surface, also impacts the public in the form of traffic slow-downs, delays, and in the case of a road closure, detours. Even when construction is out of the traveled way, traffic flows are impacted by ingress and egress of materials and equipment on and off of the roadway and by the visual impact of signage and barricading. In addition to the inconvenience to vehicular traffic, construction within or adjacent to road ROW also impacts bicycle and pedestrian traffic. Most of the roadways within the study area receive heavy use by cyclists. As part of the alternatives analysis, annual average daily traffic (AADT) information was obtained for the roadways within the study area. These traffic counts provide a quantitative method to assess the number of Boulder County citizens that will be impacted by this construction.

As stated previously, the alternative alignments for the SWSP II pipeline typically utilize permanent easement adjacent to road ROWs wherever possible, one of the reasons being to help reduce the impacts to traffic. Construction adjacent to a roadway, even if the excavation and installation of the pipeline is within permanent easement, will still have some impacts to traffic due to equipment and trucks accessing the construction site from the roadway and typical traffic slow-downs due to potential reduced speed limits through the construction zone and normal curiosity of the public. Therefore, reducing the length of pipeline construction immediately adjacent to roadways helps to reduce these types of traffic impacts. These impacts to traffic affect roadways with greater AADT counts more significantly than less traveled roadways.

As can be seen from the AADT counts in Section 2, N. 75th Street/N. 73rd Street, N. 63rd Street, and Nelson Road are fairly heavily traveled roadways. The highest AADT counts are at Airport Road from SH 119 north into the City of Longmont.

In looking at the alternatives for the SWSP II pipeline, there a few items of note:

- The Alternative 1 (proposed) alignment parallels N. 75th Street/N. 73rd Street for a length of approximately 14,700 feet and N. 63rd Street for a length of approximately 6,250 feet. The Alternative 1 alignment does not have any length parallel to SH 119. The lengths of Alternative 1 that are parallel to either a state highway or a major arterial are the least of all of the alternative alignments. Therefore, the Alternative 1 alignment is expected to have the least impact to traffic.
- The Alternative 2 (western) alignment parallels N. 63rd Street for a significant length (approximately 23,500 feet), and in two locations the alignment will be within the road ROW. In addition, the Alternative 2 alignment crosses N. 63rd Street multiple times. On N. 63rd Street just north of Niwot Road (one of the locations where the alignment will be within the road ROW) the

AADT count is 2,626. The other location where the Alternative 2 alignment will be within the N. 63rd Street ROW is just north of Monarch where the AADT count is over 4,900. At both of these locations, construction of the SWSP II pipeline would be anticipated to have significant impacts to traffic.

- The Alternative 3 (central) alignment parallels N. 75th Street/N. 73rd Street for a significant length (approximately 18,700 feet). At one location (N. 73rd Street just north of Niwot Road), the Alternative 3 alignment will be within the road ROW. The AADT count for N. 73rd Street at Nimbus Road is 4,384 and would be expected to be even higher at the intersection with Niwot Road. In addition, at N. 71st Street south to the termination at the Boulder Reservoir WTP, the Alternative 3 alignment parallels SH 119 for approximately 7,270 feet, which has a traffic count of 43,500. For these reasons, the Alternative 3 alignment is expected to also have relatively higher impacts to traffic.
- The Alternative 4 (east) alignment parallels Airport Road for a length of approximately 7,700 feet and crosses Airport Road three times. The Alternative 4 alignment also parallels SH 119 for a length of approximately 22,400 feet. With Airport Road having an AADT count of 9,398 and SH 119 having a traffic count of 32,660 to 43,500, the Alternative 4 alignment would be expected to have the most significant impact.

City of Longmont

Discussions with the City of Longmont Public Works and Transportation groups on May 9, 2007 indicate that the city is strongly against Alternative 4. The City of Longmont is very concerned about the transportation and public impacts associated with construction along Airport Road and its location adjacent to so many residences. They see reductions in speed limits of 10 mph, accompanying slowdowns and backups, and express concerns for the maintenance of access to side roads. They cite the difference in traffic counts between N. 75th Street and Airport Road as indicative of the magnitude of transportation issues that would accompany these alignments. In addition, the City of Longmont's Department of Economic Development, Planning and Development Services Division expressed opposition to the alternative that followed the existing SWSP easement through the City in a letter dated July 15, 2009 (Appendix 4).

Anticipated impacts, cited by the City of Longmont, along Airport Road include:

- Possible lane closures;
- Closures of side street with accompanying detours, and;
- Increased emissions associated with slowdowns and backups.

m. Utilities and Infrastructure

Potential impacts to existing utilities and infrastructure are a significant consideration in the selection of a transmission pipeline route such as the SWSP II for several reasons, including.

- Impacts during construction:
  - existing utility interferences
  - potential existing utility relocations

  - potential outages for existing utilities
  - difficulties for parallel construction, typically want 10-15-foot separation from existing utilities, including overhead power for parallel construction
  - slower production rate for transmission pipeline construction
  - having to deflect transmission pipeline to avoid existing utilities increases construction costs (number of fittings, slower production rates, additional length of restrained (welded) joints)
  - additional difficulties and costs in crossing larger diameter existing utilities – support of existing utility, proper backfill and compaction, clearances, cover
- Considerations after construction is complete/maintenance:
  - need adequate space between transmission pipeline and existing utilities in order to perform excavation/maintenance/repairs on transmission pipeline without disturbance of existing utilities (10-15 feet)
  - need adequate space between transmission pipeline and existing utilities in order for excavation/maintenance/repairs to be performed on existing utility without disturbance/impacts to transmission pipeline (10-15 feet)
  - potential impacts/damage to transmission pipeline due to construction of new utilities
- Existing infrastructure (i.e., roadways, bridges, curb and gutter, sidewalk, flow pans, irrigation structures:
  - best way to avoid impacts to this infrastructure is to not construct within existing road or irrigation ROWs
  - roadway crossings are typically short lengths and can be bored; this study assumes that paved arterial roadway crossings will be bored, gravel roadways open-cut
  - crossing of irrigation facilities can be bored or open-cut; typically special requirements for clearances, backfill, compaction (clay liner, bentonite mats), license agreements, irrigation structure removal and replacement
  - best way to mitigate impacts to existing bridges is to construct with adequate clearance from existing structure
  - future roadway and bridge improvements could potentially require the relocation of the transmission line at NCWCD's cost if the pipeline is within existing ROW
  - N. 75th/N. 73rd, N. 63rd Street, and Niwot Road have recently undergone Boulder County projects to widen and re-construct – these improvements are relatively new
  - Airport Road was also improved and widened to 4-lanes and included an improved interchange at SH 119 (Boulder County project)
  - Parallel construction of the transmission pipeline within existing asphalt is relatively expensive due to slower production rate, more stringent requirements for compaction and backfill, asphalt removal and replacement; likely to be required to overlay at least one lane and potentially entire roadway width (if less than 3 years old) for Boulder County; traffic control and traffic impacts
  - Planned future improvements to interchange at SH 119 and SH 52 – entrance to IBM facility
- At this study level, locations of all utilities along the alternative alignments were not detailed, and general locations along the alternative alignments were determined from the utility

mapping obtained. Based on general utility mapping obtained and recent extensive experience in design of pipeline projects adjacent and within Boulder County road ROWs, existing utilities anticipated to be within county ROW include:

  - electric power (typically overhead, although some buried, and located at the ROW line, generally on one side, but can be along both sides)
  - natural gas (buried and typically located between the edge of asphalt and the ROW line)
  - potable water (buried and typically located between the edge of asphalt and the ROW line, can be on both sides of road)
  - fiber-optic communications (buried and typically located between the edge of asphalt and the ROW line)
  - telephone (buried cable typically located between the edge of asphalt and the ROW line, generally closer to ROW line)
  - cable TV (typically buried cable and located between the edge of asphalt and the ROW line, although can be overhead on poles at the ROW line)

- As noted above, along county roadways, the existing utilities are typically located between the edge of asphalt and the ROW line. Less frequently, the existing utilities may be located beneath the asphalt roadway surface.
- Along SH 119 within the study area, the existing utilities include fiber-optic communications, potable water lines, overhead electric, and telephone:
  - These utilities are located between the edge of asphalt and the highway ROW line with overhead electric at the ROW line
  - CDOT has a requirement that no utilities be located within 15 feet of the edge of asphalt so as not to interfere with the installation and maintenance of highway signage or other highway structures (i.e., guardrail, etc.)
- Through areas within City of Longmont boundaries, the concentration of existing utilities is much greater, particularly along Airport Road, and includes natural gas, both buried and overhead electric (some high voltage), potable water, sanitary sewer, storm sewer, fiber-optic communications, traffic signal communications and power, telephone, and cable TV with these utilities being located both between the edge of asphalt and the ROW line and beneath the roadway surface.
- Some existing utilities (large overhead power lines, natural gas transmission pipelines, raw and treated water pipelines) can provide the opportunity for co-location as the existing utility provides for an existing corridor which can be paralleled.
- Issues with locating within existing ROW due to other utilities:
  - With the existing utilities being typically located between the edge of asphalt and the ROW line, there is typically very limited space in which to construct a large diameter water transmission pipeline
  - In a large majority of cases, space limitations would necessitate construction beneath the asphalt surface, which has multiple issues during construction – traffic impacts, slower production rate, impacts to existing asphalt and requirements for repair and potentially overlay
  - Locating within a public road ROW creates the issue of potential damage to the water pipeline by the installation of other new utilities or maintenance of existing utilities

– Makes the maintenance and/or repairs of the proposed water pipeline more difficult and costly due to the limited space, having to protect other existing utilities, traffic control, permitting through roadway agency, and repair of roadway surface.

Alternative Alignments - General

Each of the alternative pipeline alignments typically have utilized new easement, either cross-country or adjacent to existing road ROWs in order to reduce the impacts to existing utilities, to reduce the risk of damage to the new pipeline from new utility construction, and to provide for improved conditions to perform maintenance and/or repairs. Therefore, except for a few cases, the greatest potential for impacts to existing utilities occurs at road crossings.

Alternative 1 (proposed alignment)

The Alternative 1 alignment utilizes new easement, either cross-country or adjacent to existing road ROWs. Existing utilities will be encountered at each road crossing. These crossings would be perpendicular and relatively short, therefore limiting the impact. With the asphalt roadways proposed to be bored and jacked crossings, this will further reduce potential impacts.

Alternative 2 (western alignment)

The Alternative 2 alignment also utilizes new easement, either cross-country or adjacent to existing road ROWs. However, this alignment includes a greater number of road crossings, particularly along N. 63rd Street, and also includes two segments along N. 63rd Street where the pipeline alignment would be forced into the road ROW due to adjacent private property improvements. Although the perpendicular crossings of N. 63rd Street are anticipated to be bored and jacked, the greater number of these crossings increases the potential impacts to existing utilities. The two segments where the proposed alignment is within the N. 63rd Street ROW (just north of Niwot Road and just north of Monarch Road) present the greatest potential for existing utility impacts. Due to the limited space available within the ROW between the edge of asphalt and the ROW line because of existing utilities occupying this space (as described above), it is likely that the proposed pipeline would have to be constructed within the asphalt road surface, which then encompasses all of the difficulties and expense of this type of construction.

Alternative 3 (central alignment)

Again, the Alternative 3 alignment utilizes new easement, either cross-country or adjacent to existing road ROWs. A portion of this alignment follows the east side of N. 75th Street north of Nelson Road which lies within the City of Longmont. As a result, this segment would be anticipated to have more potential existing utility impacts due to the additional City of Longmont utilities at this location. In addition, just north of the intersection of Niwot Road and N. 73rd Street, the proposed pipeline alignment will be forced into the N. 73rd Street ROW due to the adjacent private property improvements and large existing cottonwood trees. With existing utilities occupying the space between the edge of asphalt and the ROW, it is likely that the new pipeline construction would be required to occur within the asphalt roadway for this short segment. For the Alternative 3 alignment, a new pipeline spur is required in order to deliver water to the LHWD. This spur from N. 73rd Street is located parallel to an

existing LHWD 30-inch transmission pipeline. Otherwise, the majority of the existing utility impacts for this alignment are anticipated to occur at the road crossing locations.

Alternative 4 (east alignment)

The Alternative 4 alignment utilizes a significant portion of the existing SWSP pipeline easement (approximately 16,355 feet) from St. Vrain Road south through the City of Longmont. This existing alignment intersects with Airport Road (N. 87th Street) at approximately Clover Basin Drive and then parallels Airport Road south. Along SH 119, the Alternative 4 alignment utilizes easement adjacent to the SH 119 ROW to reach the end point at the Boulder Reservoir WTP. The spur segment to deliver water to the LHWD will parallel an existing LHWD 30-inch treated water pipeline easement.

This alignment will have the greatest potential for existing utility impacts, particularly in the segment from Nelson Road south to approximately Pike Road within the City of Longmont. This portion of the alignment has experienced significant development since the original pipeline was constructed. There are several developments that completely encompass the existing SWSP waterline easement and include multiple road crossings with signalized intersections. This alignment crosses Airport Road twice and also crosses Clover Basin Drive. Both roadways are significant utility corridors for not only City of Longmont utilities, but also LHWD, buried electric, natural gas, fiber-optic communications, telephone, and cable TV. The newer developments also include larger diameter storm sewer systems which cross the existing SWSP easement. Construction through this portion of the alignment will also encounter a significant number of existing utilities which closely parallel the existing SWSP easement.

The SH 119 ROW south and west from the intersection with Airport Road includes several existing utilities that run parallel with the roadway, the most significant being a new ATT fiber-optic communications conduit. This fiber-optic conduit is located between the edge of asphalt and the ROW line, generally 20 feet from the edge of asphalt. Other utilities include overhead power, treated water pipelines, and telephone. With these existing parallel utilities occupying the area between the edge of asphalt and the ROW line, there is not adequate space to construct a large diameter water transmission pipeline within the existing SH 119 ROW. As a result, the Alternative 4 alignment utilizes new easement adjacent to the SH 119 ROW. This alignment will minimize the impacts to these existing parallel utilities and will greatly reduce the potential risk to the proposed water transmission pipeline from construction of additional utilities within the SH 119 ROW. By utilizing adjacent easement, potential existing utility impacts will be limited to the locations of the existing road crossings.

Conclusion

Based on a thorough analysis of the alternatives, Alternative 1 is the least damaging alternative. Alternative 1 has the lowest disturbance to trees, lowest level of transportation effects, and has the least amount of conflict with existing utilities. It is also close to having the lowest amount of disturbance to agricultural lands. In addition, Alternative 1 has the lowest number of parcels crossed and close to the lowest number of residences within 100 feet. For other considerations such as stream crossings, wetlands, crossings of critical habitat, and riparian vegetation, Alternative 1 falls in the mid-range among the alternatives considered. Although other alternatives have an advantage on some individual evaluation criteria, none are consistently better or result in less environmental damage.

The environmental impacts associated with Alternative 1 can be mitigated to minimize both the short- and long-term effects. Impacts to riparian forest through Left Hand Creek are minimized by the alignment that Alternative 1 takes, which routes the construction between the large trees, thereby avoiding impacts that are reflected in an overall acreage calculation. Timing of construction across the larger perennial and intermittent drainages will occur in winter to minimize impacts to active wildlife. Nearby raptor nests will be avoided during the nesting season. Open space and conservation land designations, as well as agricultural land uses, will be mitigated by fully revegetating the easement to pre-construction conditions. Construction on agricultural and irrigated lands will occur when soil conditions are dry to the extent possible to minimize the collapse of soil structure and increased compaction. Soil amendments and decompaction (through deep ripping) or subsoil will be used if compaction occurs. Flood irrigated fields will be restored and grade adjustments will be made if settling occurs. Any tile drains encountered will be repaired.

APPENDICES

Appendix 1. Boulder County Letter

Boulder County

Land Use

Courthouse Annex • 2045 13th Street • Boulder, Colorado 80302 • Tel: 303.441.3930 • Fax: 303.441.4856
Mailing Address: P.O. Box 471 • Boulder, Colorado 80306 • **www.bouldercounty.org**

October 14, 2009

Jim L. Struble, SR/WA
Real Estate Manager
Northern Colorado Water
220 Water Avenue
Berthoud, Colorado 80513

Dear Mr. Struble:

As requested, Land Use staff have complied the following list of items to be included in the required alternatives analysis.

- Identify the length and width of the Pipeline in National, State, Local Ag Lands – include permanent easement numbers and construction easement numbers
- Identify the area of Disturbance in National, State, Local Ag Lands
- Identification of Irrigated Lands and Method of Irrigation
- For irrigated lands describe and quantify both the long term and short term impacts of the pipeline on irrigated lands
- Identify lands under production, describe and quantify both the long term and short term impacts of the pipeline on productive land
- Identify all water feature crossings and the nature and extent of any associated habitat, describe and quantify the impact of pipeline construction on the associated habitat
- Identify existing riparian areas and describe and quantify the impact of pipeline construction on the identified resource (include a discussion of tree and other vegetation removal/impact here)
- Identify existing Rare Plant/Significant Natural Community areas and describe and quantify the impact of pipeline construction on the identified resource
- Identify existing Critical Wildlife Habitat areas and describe and quantify the impact of pipeline construction on the identified resource
- Identify existing State and Federal threatened and endangered species habitat and describe and quantify the impact of pipeline construction on the identified resource
- Identify where pipeline construction would have a traffic/transportation impact and describe and quantify the nature of this impact
- Identify where pipeline construction would impact existing development (and where development may encroach into the existing easement) and describe and quantify the nature of this impact
- Map of each alternative analyzed at the scale of Map 11 of the application packet
- More detailed maps should be used to help identify the requested information

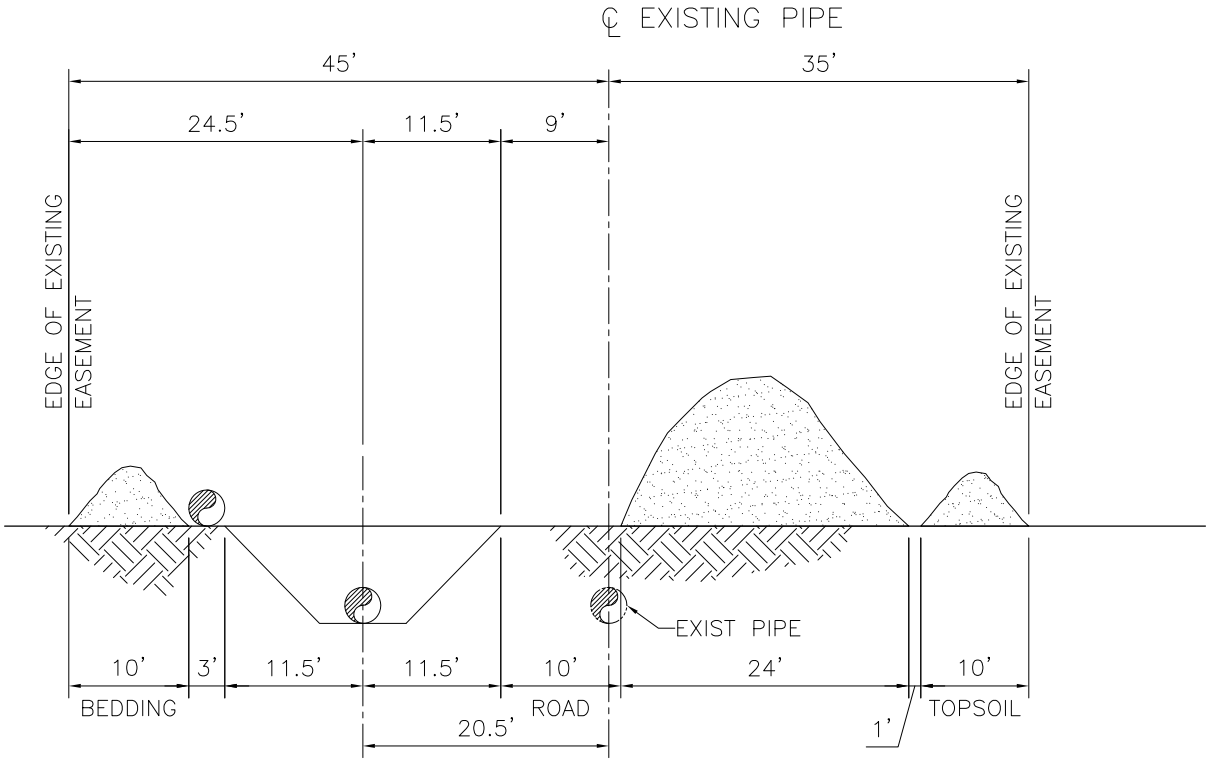
At our last meeting we reached the agreement that the alternatives analysis would include a minimum of three alternatives. These alternatives included your preferred alternative as outlined in the application materials, a second alternative which maximizes the use of existing rights of way and easements (this is the alternative utilizing the existing easement through Longmont and Highway 119 right of way), and a third alternative which was undefined.

Please contact me at (720) 564-2603 if you have any questions or if I may be of assistance.

Sincerely,

Hannah L. Hippely, AICP
Planner II

Appendix 2. Pipeline Cross-Sections



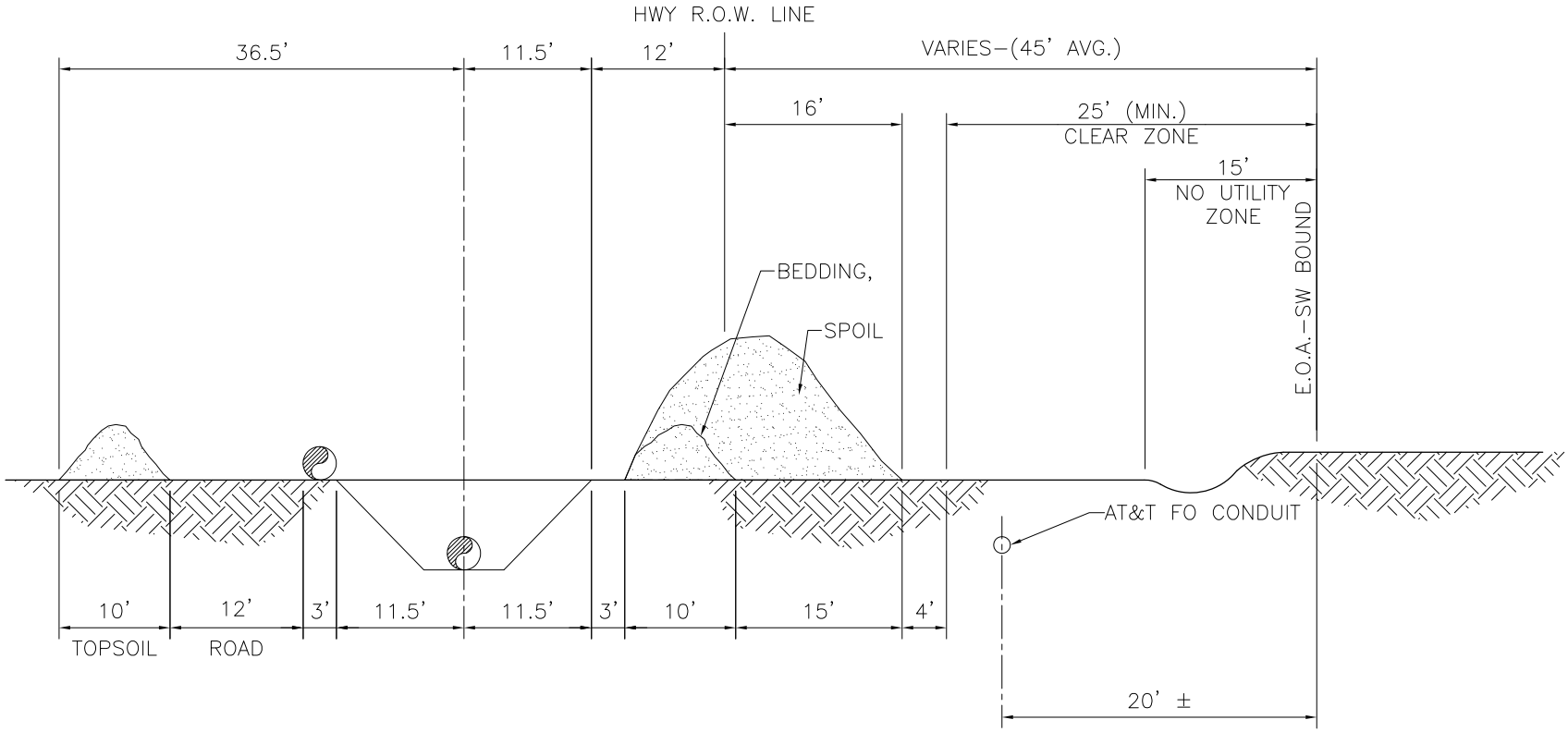
EXISTING 80 FT. EASEMENT
ALT. 1 45/35 SPLIT

Integra Engineering
1095 S. MONACO PARKWAY
Denver, Colorado 80224
(303)825-1802

DRAWING: NC14FIGURE7.dwg
DATE: 03/16/10
REVISION NO. A

NORTHERN COLORADO WATER CONSERVANCY DISTRICT
SOUTHERN WATER SUPPLY PIPELINE II
ALIGNMENT EVALUATION

FIGURE 7



NEW EASEMENT–60 FT. PERM. EASEMENT PARALLEL TO SH 119 R.O.W.

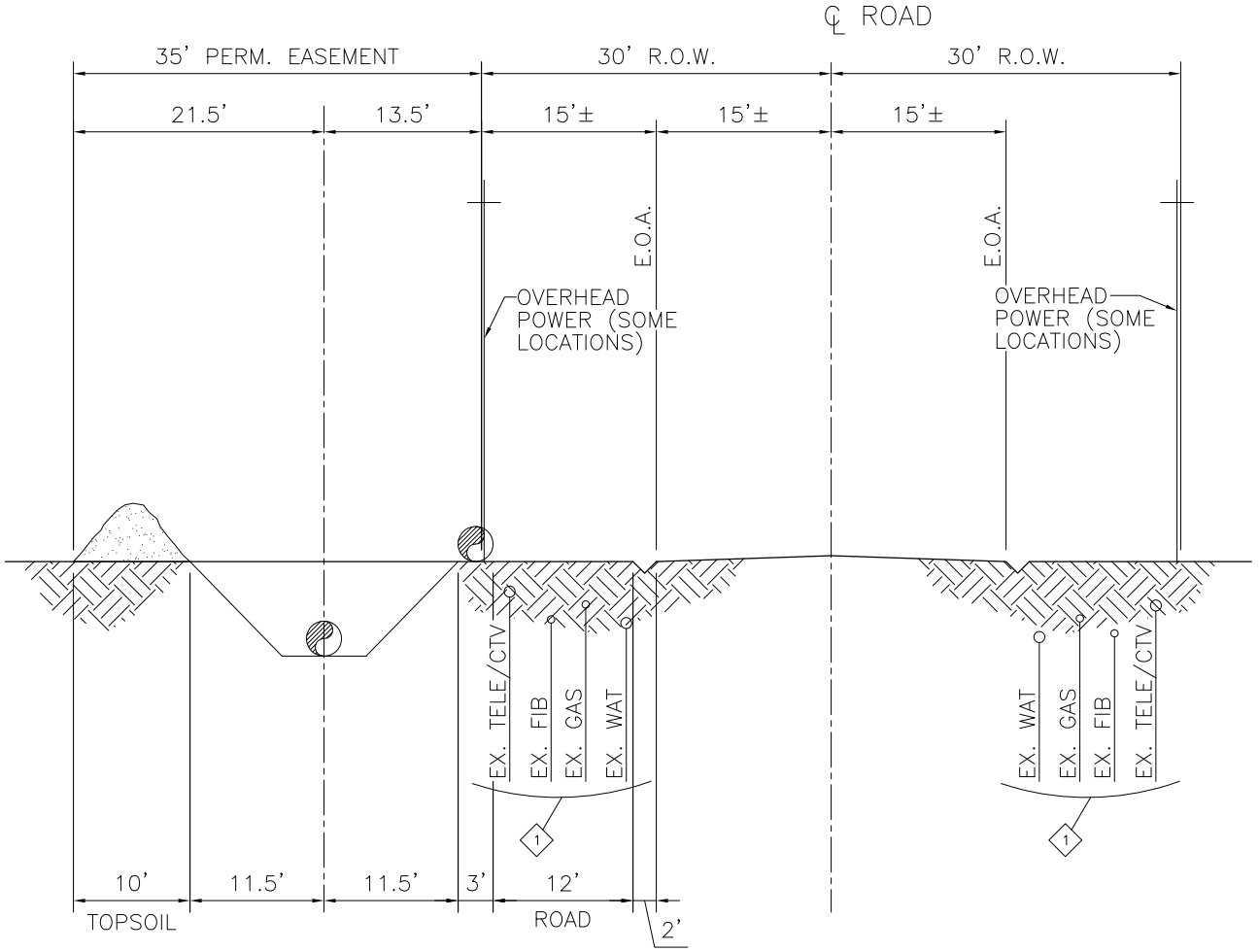
Integra Engineering
1095 S. MONACO PARKWAY
Denver, Colorado 80224
(303)825–1802

DRAWING: NC14FIGURE6.dwg
DATE: 03/16/10
REVISION NO. A

NORTHERN COLORADO WATER CONSERVANCY DISTRICT
SOUTHERN WATER SUPPLY PIPELINE II
ALIGNMENT EVALUATION

FIGURE 6

KEY NOTE:
1 POSSIBLE UTILITIES



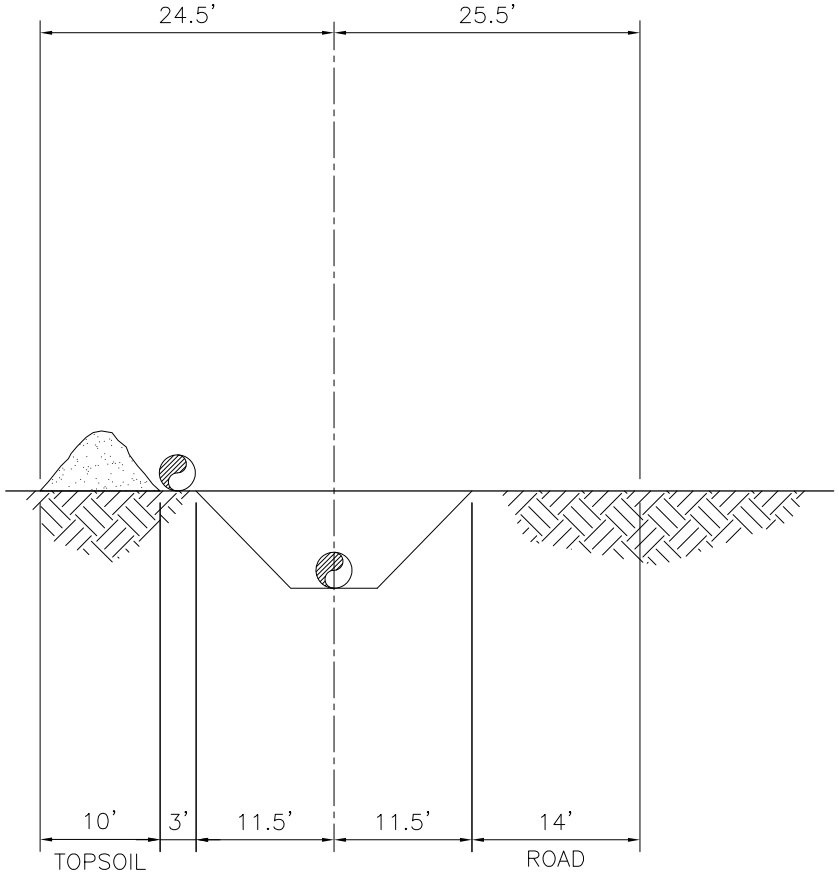
NEW EASEMENT—35 FT.—RESTRICTED CORRIDOR PARALLEL TO COUNTY RD.—75th/73rd./63rd.

Integra Engineering
1095 S. MONACO PARKWAY
Denver, Colorado 80224
(303)825-1802

DRAWING: NC14FIGURE5.dwg
DATE: 03/16/10
REVISION NO. A

NORTHERN COLORADO WATER CONSERVANCY DISTRICT
SOUTHERN WATER SUPPLY PIPELINE II
ALIGNMENT EVALUATION

FIGURE 5



RESTRICTED CONSTRUCTION CORRIDOR–50 FOOT PERM. EASEMENT

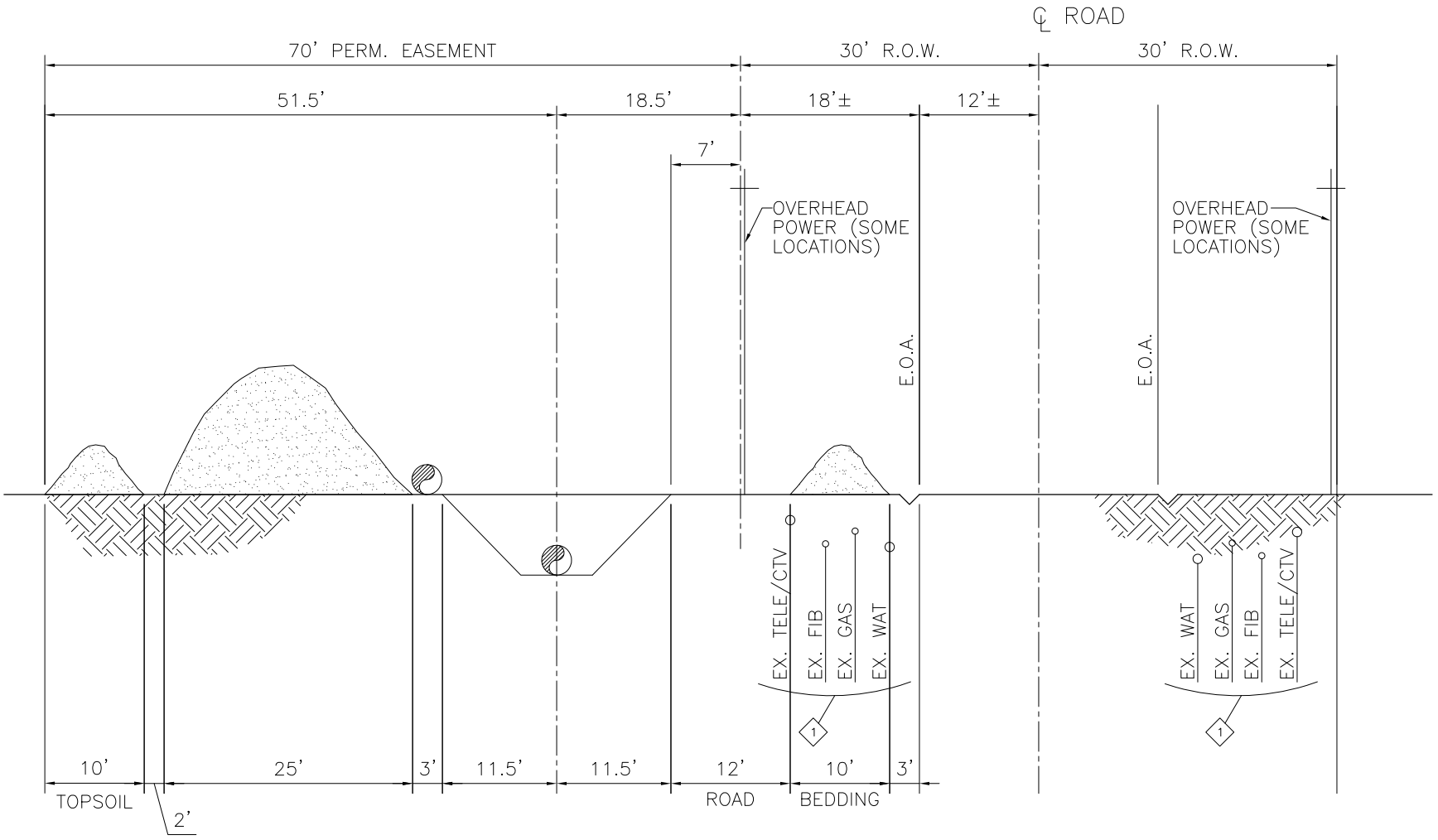
Integra Engineering
1095 S. MONACO PARKWAY
Denver, Colorado 80224
(303)825–1802

DRAWING: NC14FIGURE4.dwg
DATE: 03/16/10
REVISION NO. A

NORTHERN COLORADO WATER CONSERVANCY DISTRICT
SOUTHERN WATER SUPPLY PIPELINE II
ALIGNMENT EVALUATION

FIGURE 4

KEY NOTE:
1 POSSIBLE UTILITIES



NEW EASEMENT 70 FT–PARALLEL TO COUNTY ROAD NIMBUS/OXFORD/MONARCH/AIRPORT RD.

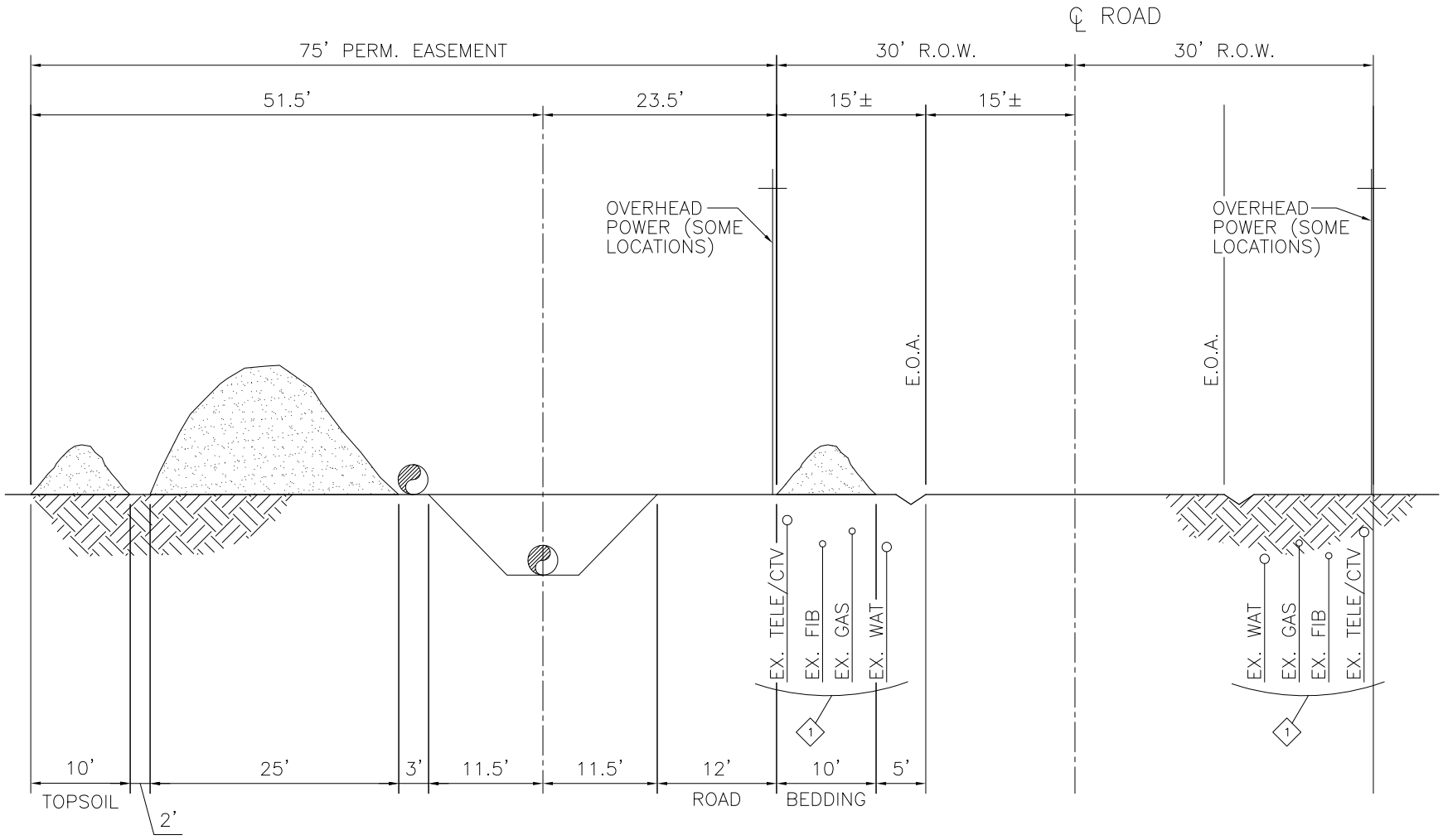
Integra Engineering
1095 S. MONACO PARKWAY
Denver, Colorado 80224
(303)825–1802

DRAWING: NC14FIGURE3.dwg
DATE: 03/16/10
REVISION NO. A

NORTHERN COLORADO WATER CONSERVANCY DISTRICT
SOUTHERN WATER SUPPLY PIPELINE II
ALIGNMENT EVALUATION

FIGURE 3

KEY NOTE:
1 POSSIBLE UTILITIES



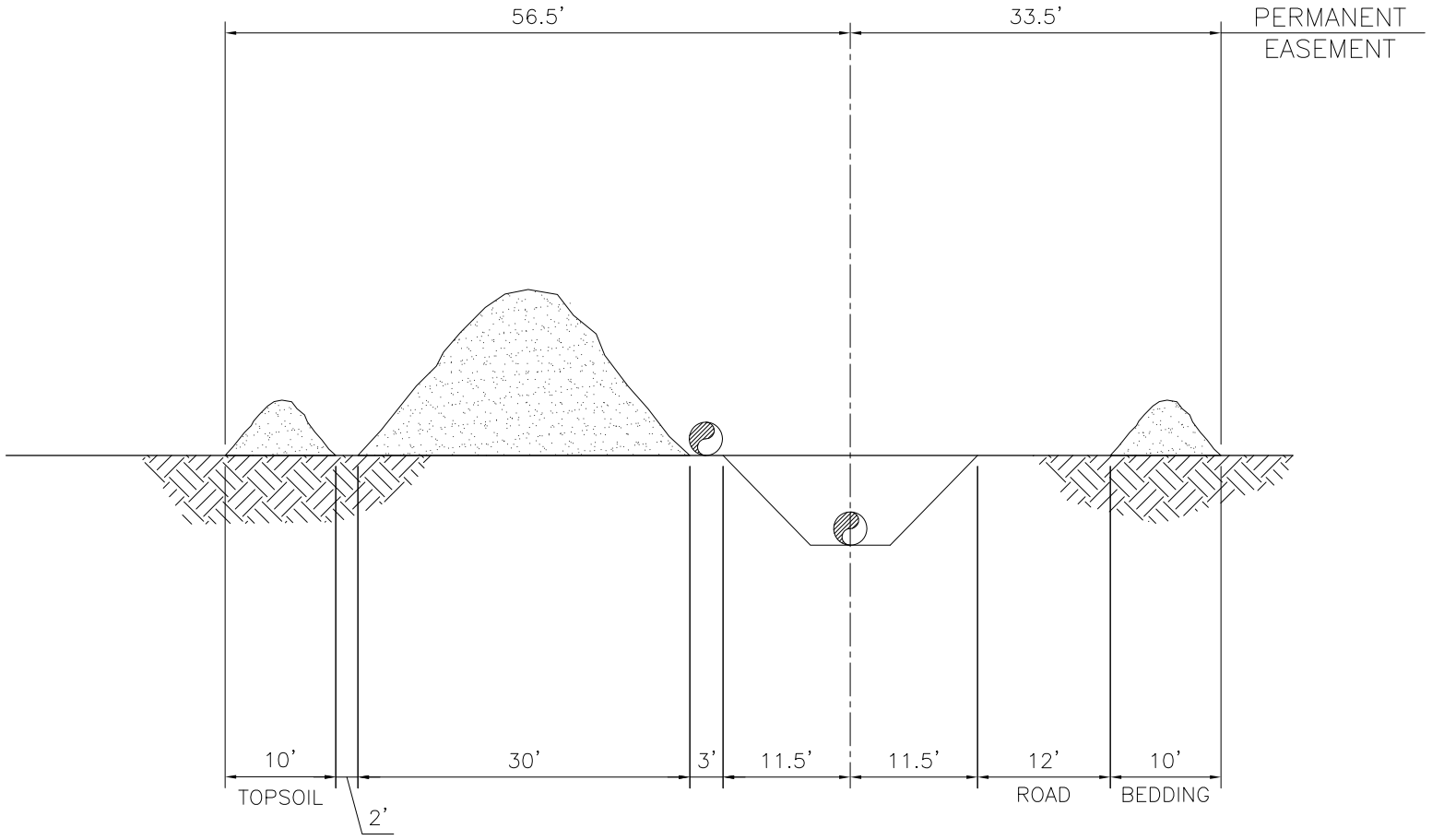
NEW EASEMENT 75 FT–PARALLEL TO COUNTY ROAD–75th/73rd./63rd.

Integra Engineering
1095 S. MONACO PARKWAY
Denver, Colorado 80224
(303)825–1802

DRAWING: NC14FIGURE2.dwg
DATE: 03/16/10
REVISION NO. A

NORTHERN COLORADO WATER CONSERVANCY DISTRICT
SOUTHERN WATER SUPPLY PIPELINE II
ALIGNMENT EVALUATION

FIGURE 2



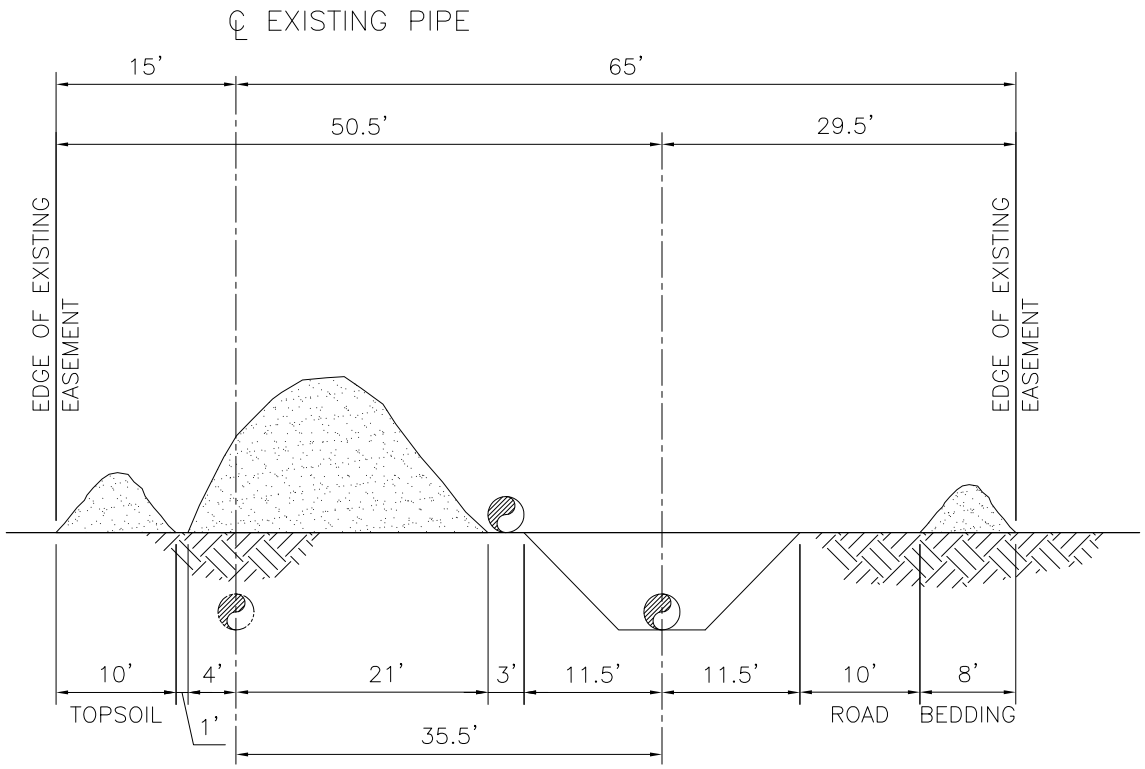
NEW 90 FOOT EASEMENT

Integra
Engineering
1095 S. MONACO PARKWAY
Denver, Colorado 80224
(303)825-1802

DRAWING: NC14FIGURE1.dwg
DATE: 03/16/10
REVISION NO. A

NORTHERN COLORADO WATER CONSERVANCY DISTRICT
SOUTHERN WATER SUPPLY PIPELINE II
ALIGNMENT EVALUATION

FIGURE 1



EXISTING 80 FT. EASEMENT
ALT. 2 15/65 SPLIT

Integra Engineering
1095 S. MONACO PARKWAY
Denver, Colorado 80224
(303)825-1802

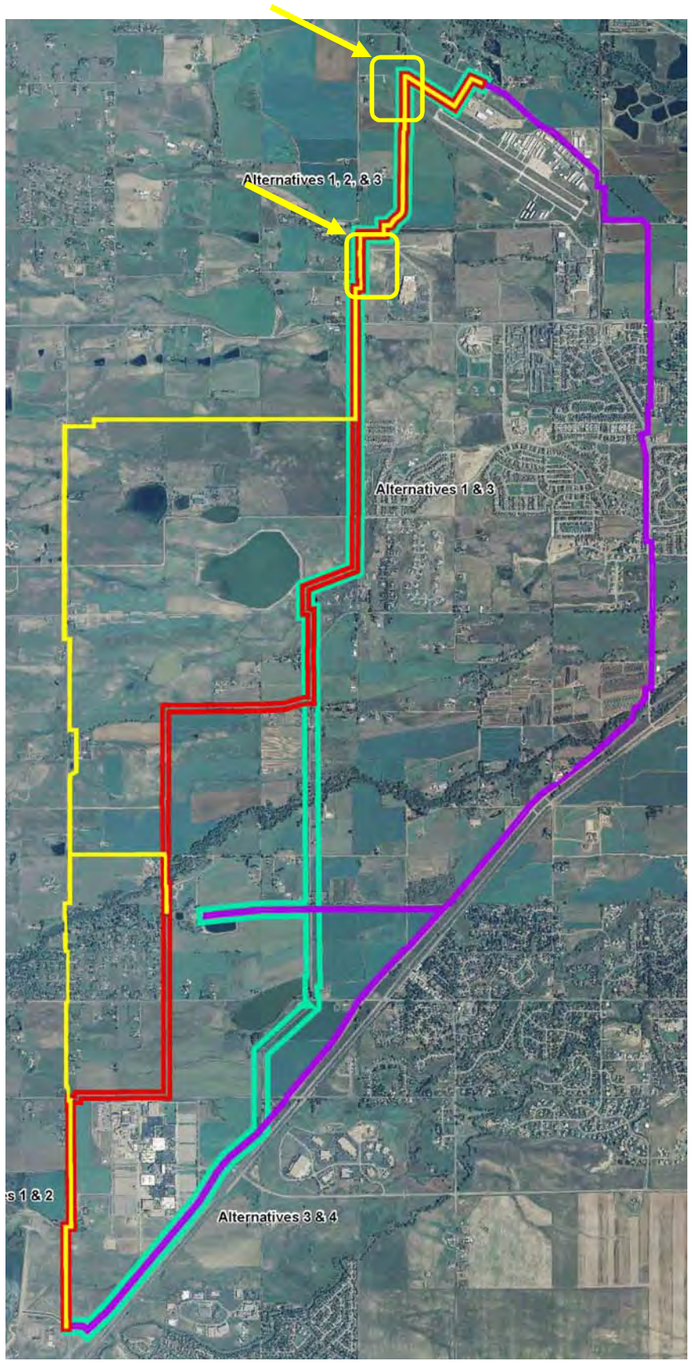
DRAWING: NC14FIGURE8.dwg
DATE: 03/16/10
REVISION NO. A

NORTHERN COLORADO WATER CONSERVANCY DISTRICT
SOUTHERN WATER SUPPLY PIPELINE II
ALIGNMENT EVALUATION

FIGURE 8

Appendix 3. Route Photos

Alternatives 1, 2, and 3 turn south just past the airport runway, near a cottonwood with a redtail hawk nest in it. Alternatives 1, 2, and 3 parallel the west side of the Clover Basin Ditch.



Alternatives 1,2, and 3 come across from the east and then turn south on the east side of 75th St.

Southern Water Supply Project

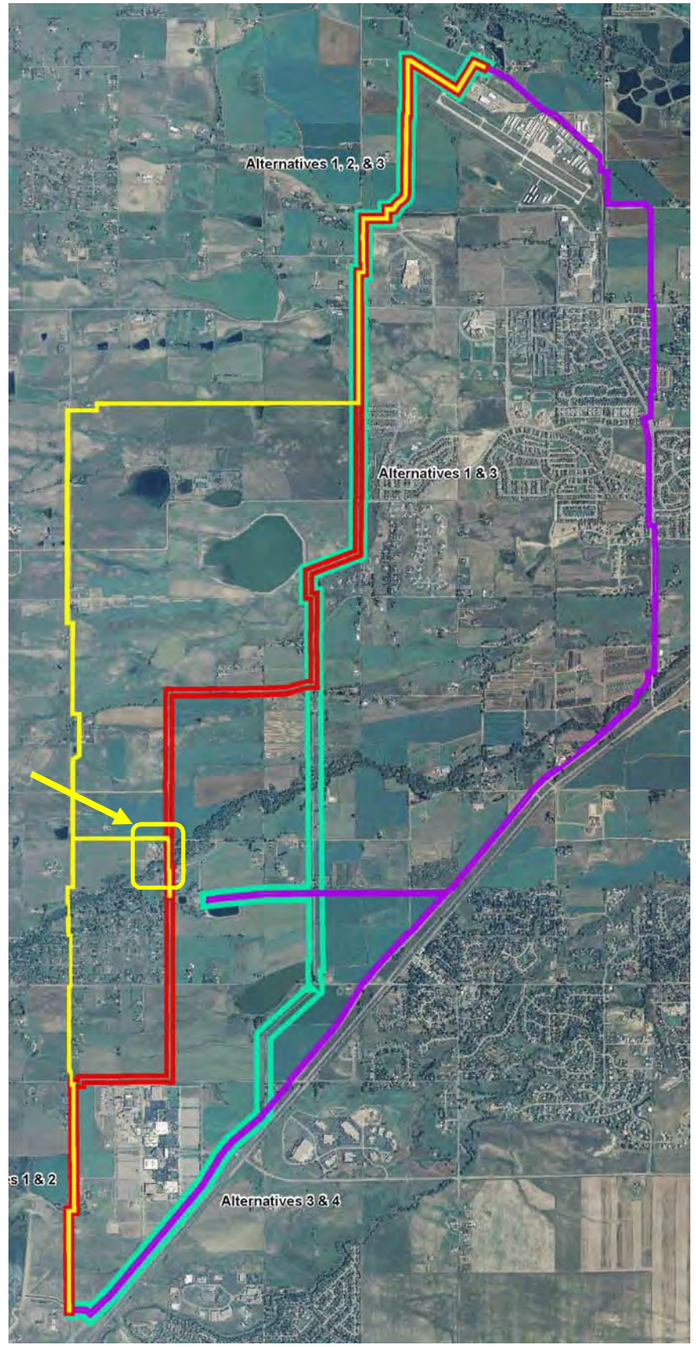
Northern Colorado Water Conservancy District

Figure 1

Alternatives 1, 2, & 3

AECOM

Alternatives 1 and 2 parallel 67th St. on the east side through wild plum and head south through the cottonwoods to cross Left Hand Creek.



Looking south, Alternatives 1 and 2 thread through the canopy of cottonwood trees that are part of the Left Hand Creek riparian zone. Although there appears to be a dense canopy, the trunks of the trees are relatively well spaced, where construction could occur with only limited thinning and trimming.

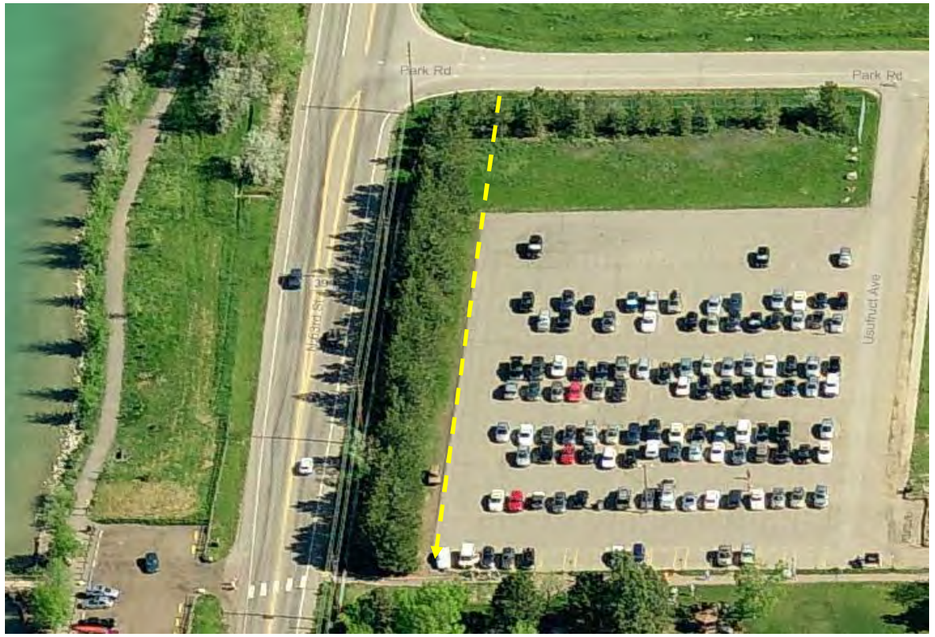
Southern Water Supply Project

Northern Colorado Water Conservancy District

Figure 2

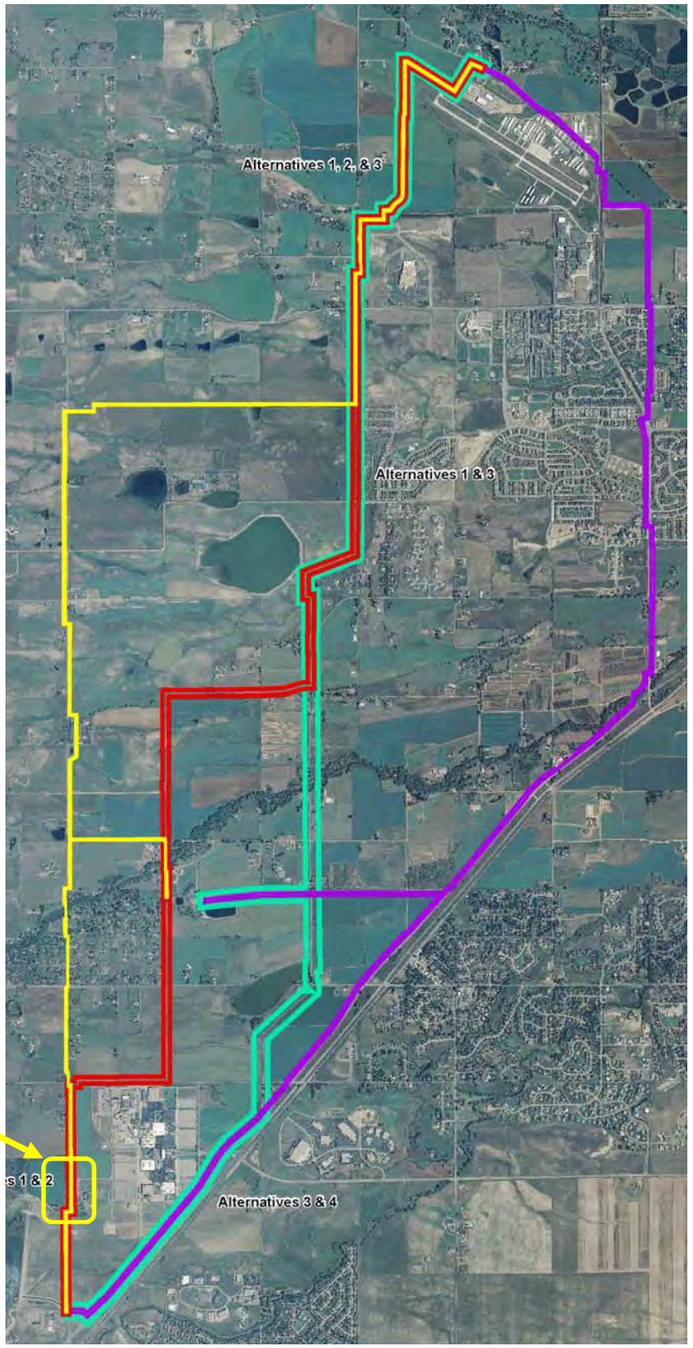
Alternatives 1 and 2

AECOM



Alternatives 1 and 2 parallel 63rd St. on the east side and head south, east of the windrow of landscape trees screening the parking lot. The windrow of large landscape trees would be avoided; however, portions of the parking lot would be impacted.

Alternatives 1 and 2 continue south through Tom Watson Park adjacent to the path. Most of the larger landscape trees would be avoided. Temporary impacts to the path and park infrastructure would occur, but these areas would be restored following construction.



Southern Water Supply Project

Northern Colorado Water Conservancy District

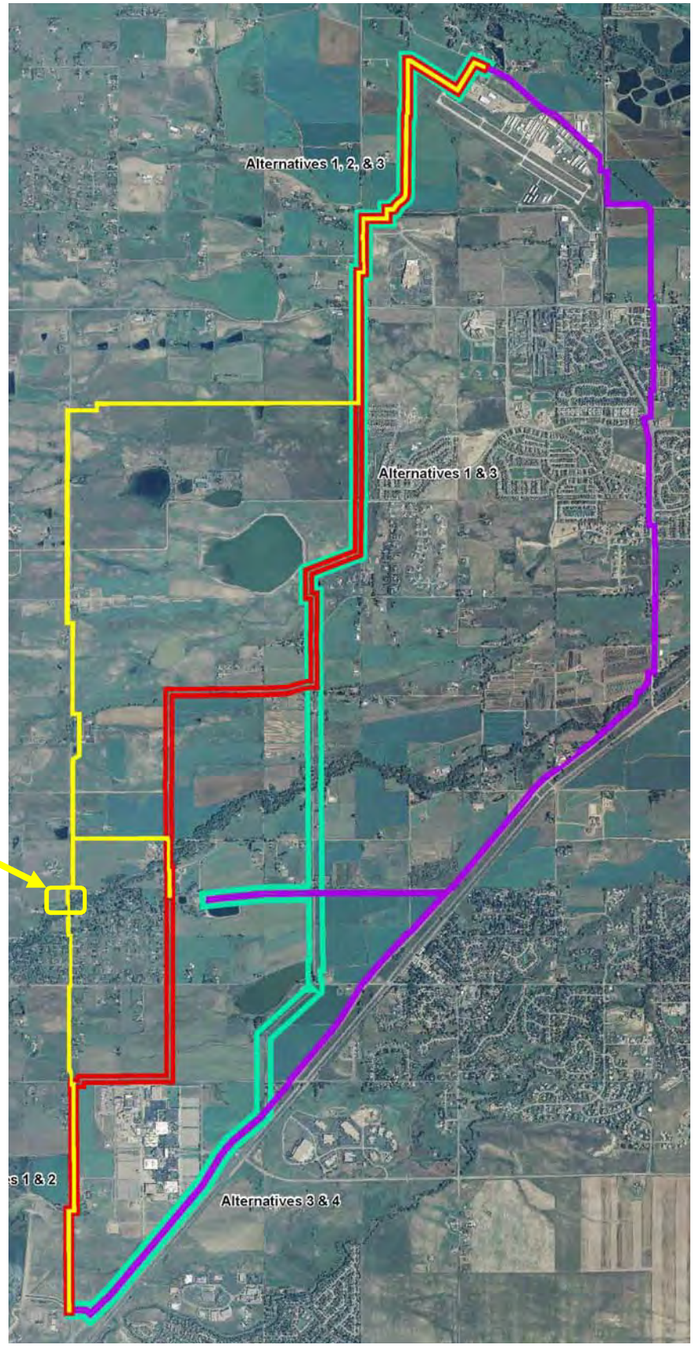
Figure 3

Alternatives 1 and 3

AECOM

Crossing Left Hand Creek at 63rd St., Alternative 2 becomes constrained by Left Hand Creek and associated bridge, as well as the residential development close to the road.

Looking south along 63rd St., Alternative 2 is confined by the bridge, the heavily vegetated creek corridor with mature cottonwoods, and the existing Left Hand Water District pipeline on the west side.



Southern Water Supply Project

Northern Colorado Water Conservancy District

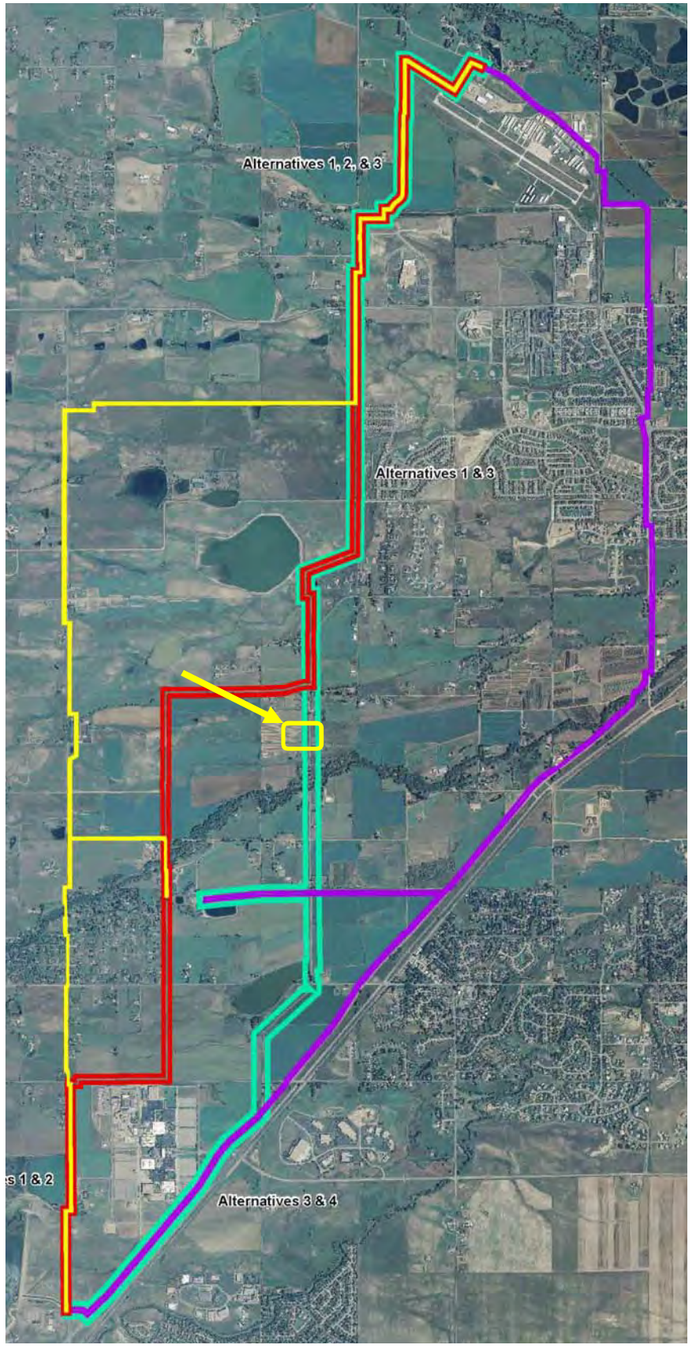
Figure 4

Alternative 2

AECOM

Alternative 3 crosses the Holland Ditch on the east side of 73rd St. and is constrained by native cottonwoods and residential landscape. Most of the windrow of landscape trees would be avoided.

Looking north along 73rd St., Alternative 3 follows the east side of 73rd St. and crosses the Holland Ditch. Many of the windrow of landscape trees would be avoided.



Southern Water Supply Project

Northern Colorado Water Conservancy District

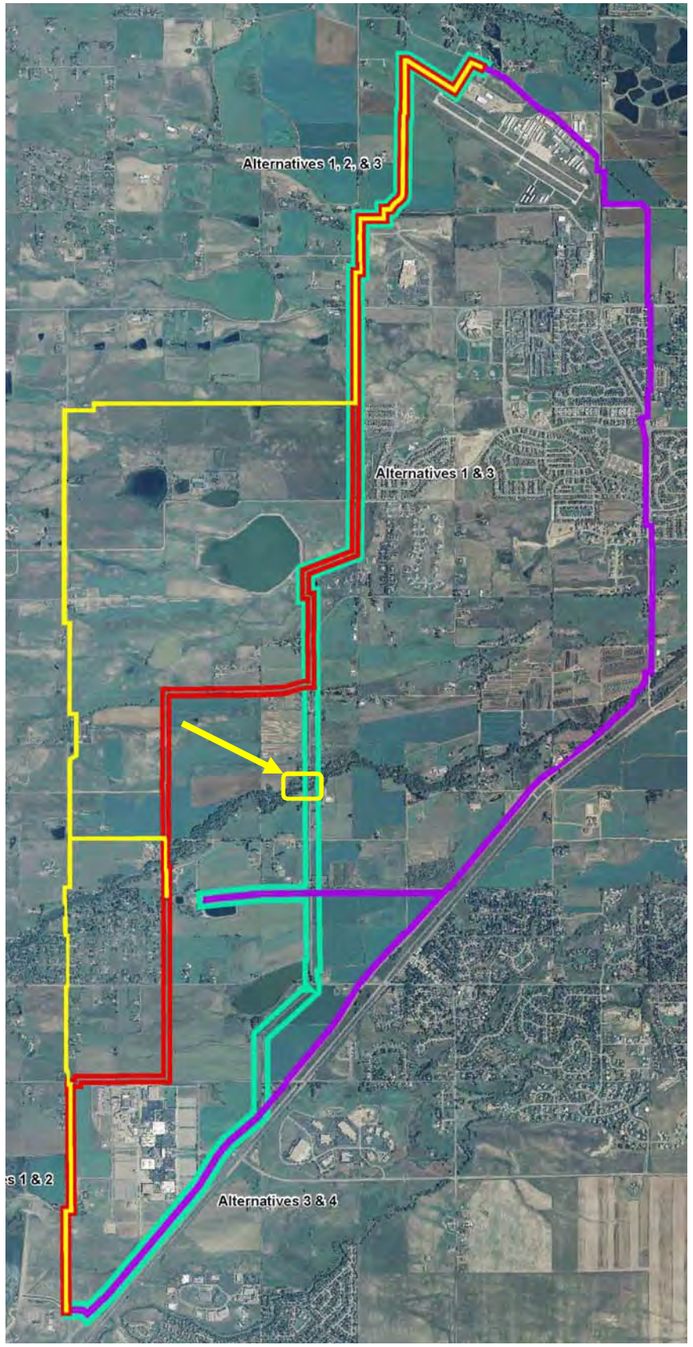
Figure 5

Alternative 3

AECOM

Alternative 3 crosses Left Hand Creek on the east side of 73rd St. and is constrained by native cottonwoods and residential landscape. Most of the windrow of landscape trees would be avoided.

Looking north along 73rd St., Alternative 3 follows the east side of 73rd St. and crosses Left Hand Creek.



Southern Water Supply Project

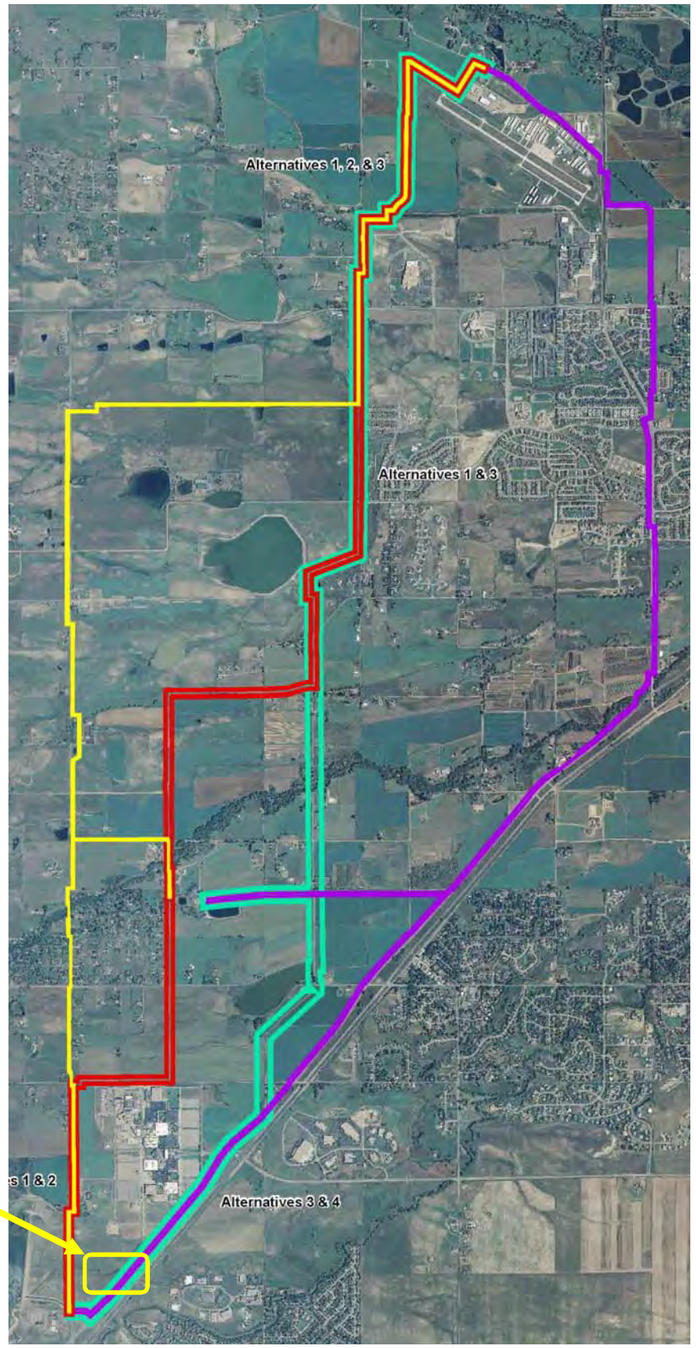
Northern Colorado Water Conservancy District

Figure 6

Alternative 3

AECOM

Alternatives 3 and 4 parallel SH 119 on the north side. New permanent easement would need to be acquired; however, the existing ROW could be used for construction easement. A small drainage containing a freshwater emergent marsh, dominated by cattails, is crossed at this location.



Looking west along SH 119, Alternatives 3 and 4 parallel the highway on the north side and cross a small wetland as they head to the Boulder Reservoir WTP.

Southern Water Supply Project

Northern Colorado Water Conservancy District

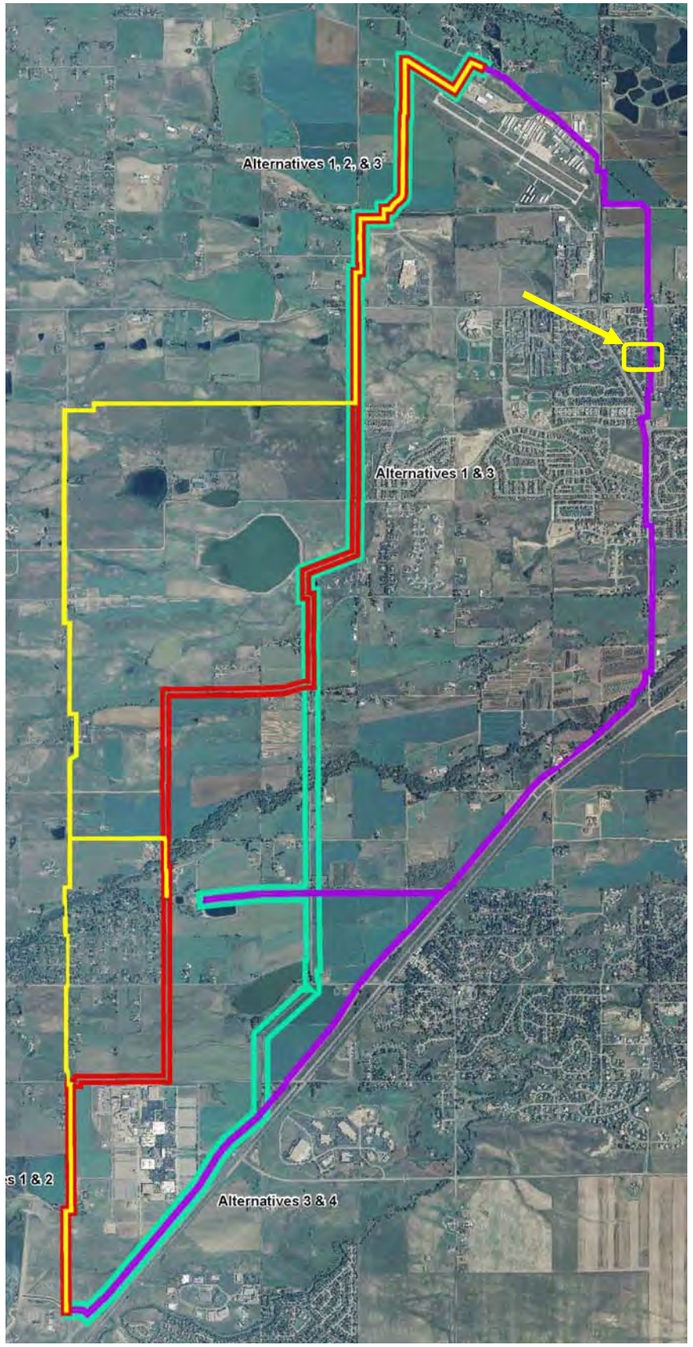
Figure 7

Alternatives 3 and 4

AECOM

Looking north from Boxelder Drive, Alternative 4 crosses through a neighborhood greenbelt that also serves as a detention basin. Ornamental landscape trees and PVC fence would be impacted and replaced.

Further north, Alternative 4 would cross a pedestrian/bike pathway and Dry Creek, and continue north through a hay field.



Southern Water Supply Project

Northern Colorado Water Conservancy District

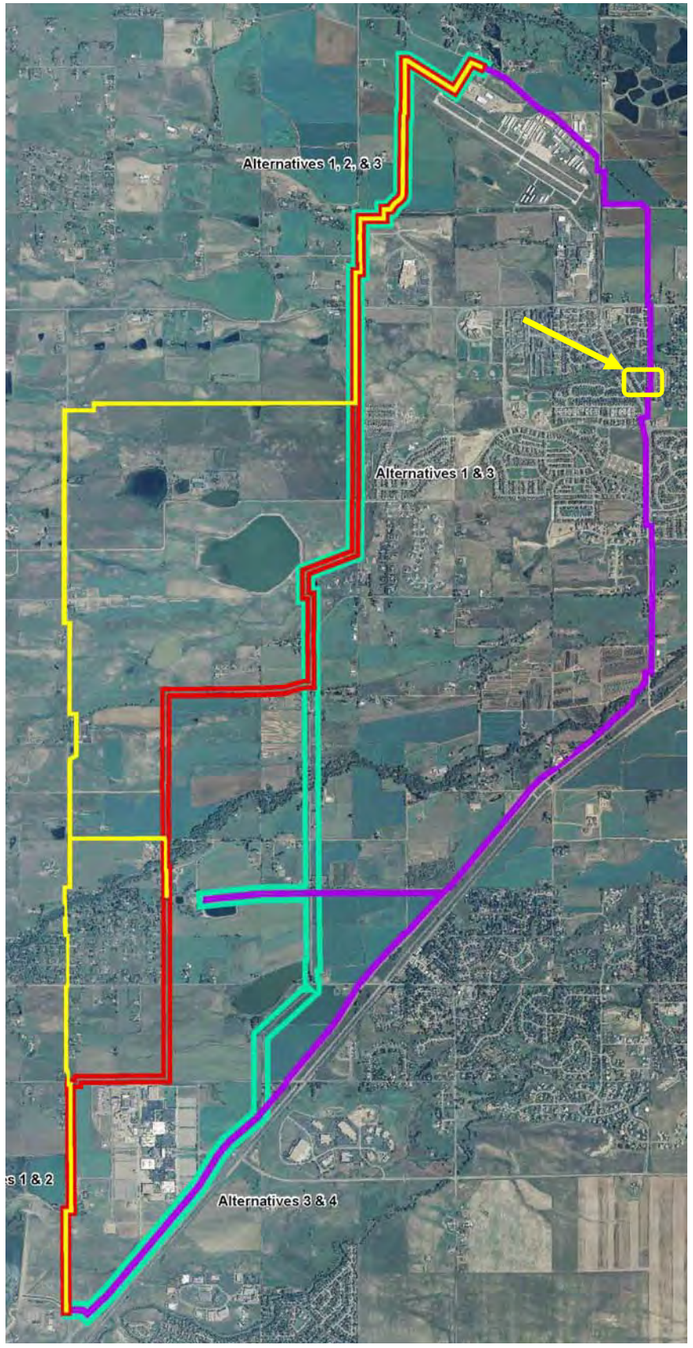
Figure 8

Alternative 4

AECOM

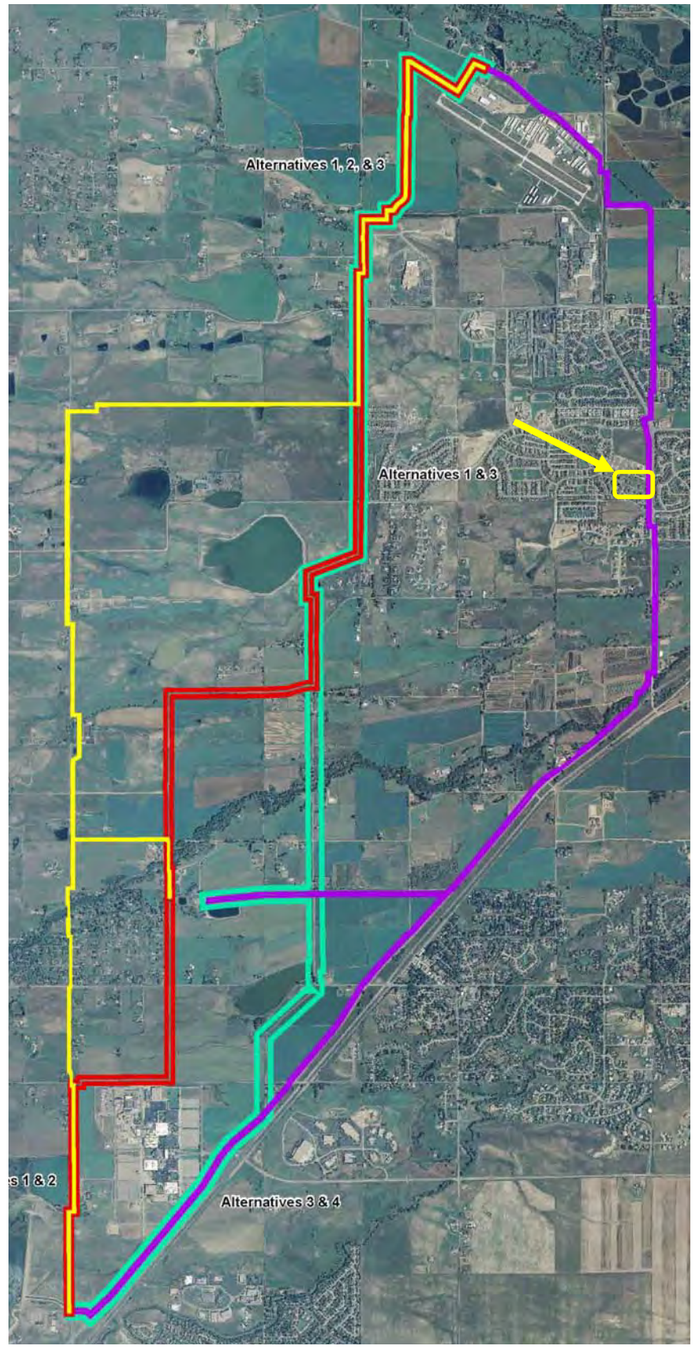
Looking south from Boxelder Drive, Alternative 4 crosses through a neighborhood greenbelt along the back porch of a number of patio homes and the back fence of single family homes. Ornamental landscape trees and pedestrian/bike pathway would be impacted and replaced.

Looking north, Alternative 4 would temporarily impact all of the landscaping and bike path between the fence line and the back porch of the patio homes on Boxelder Drive.



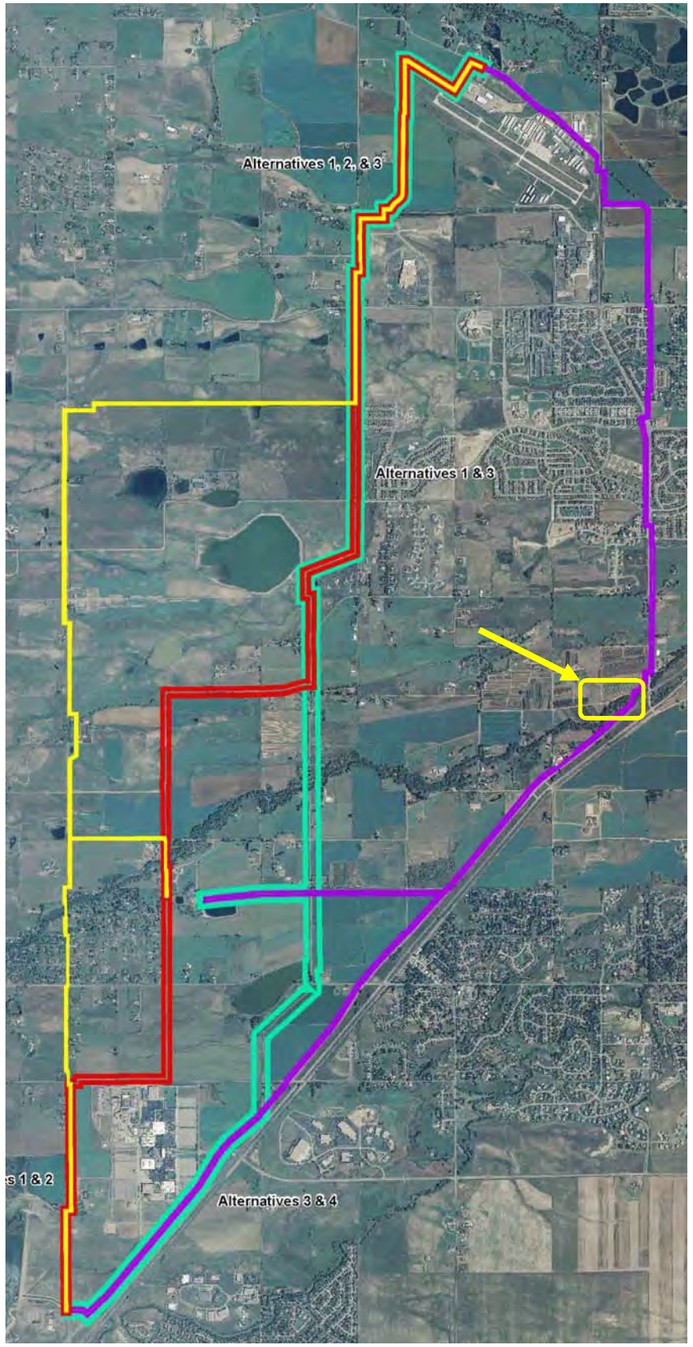
Looking north along Airport Road in Longmont, Alternative 4 would be located in the existing easement on the west side of Airport Road between the street curb and the walkway to the condos.

Looking west on Airport Road, Alternative 4 would impact all of the landscape between the curb and the sidewalk to the front door of the condos.



Alternative 4 heads south along the west side of Airport Road and cuts diagonally across the New Forest Lane driveway to the southwest. Alternative 4 crosses through the narrowest stretch of cottonwoods that line Left Hand Creek and then heads west, paralleling the north side of SH 119.

Alternative 4 cuts across Left Hand Creek through the narrowest and youngest stand of cottonwoods.



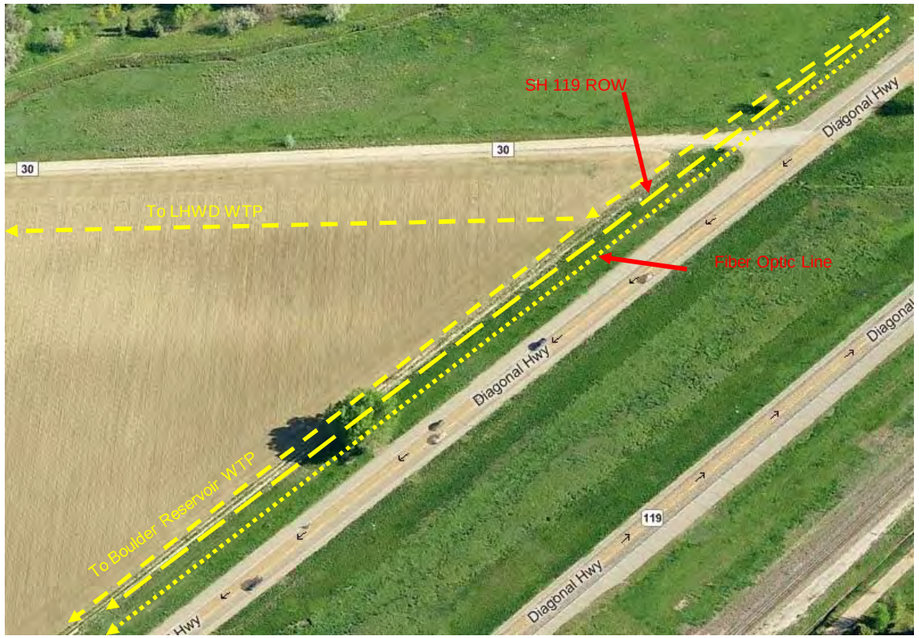
Southern Water Supply Project

Northern Colorado Water Conservancy District

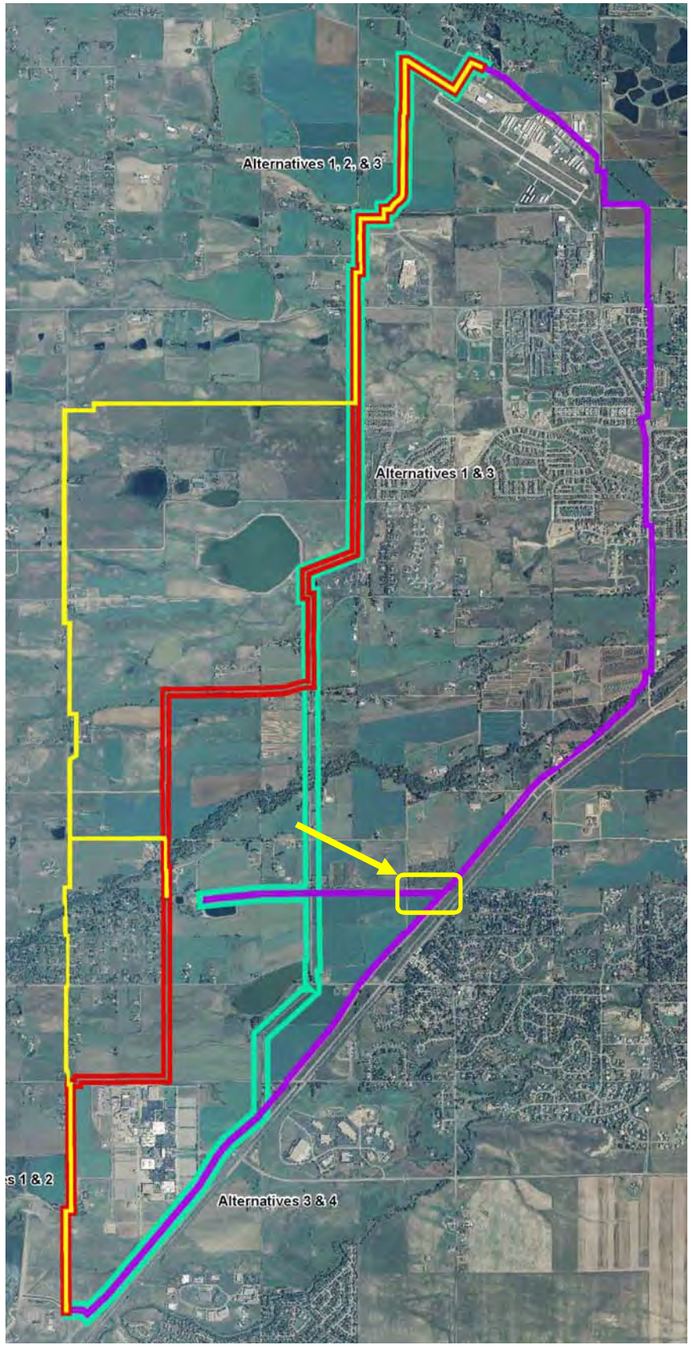
Figure 11

Alternative 4

AECOM

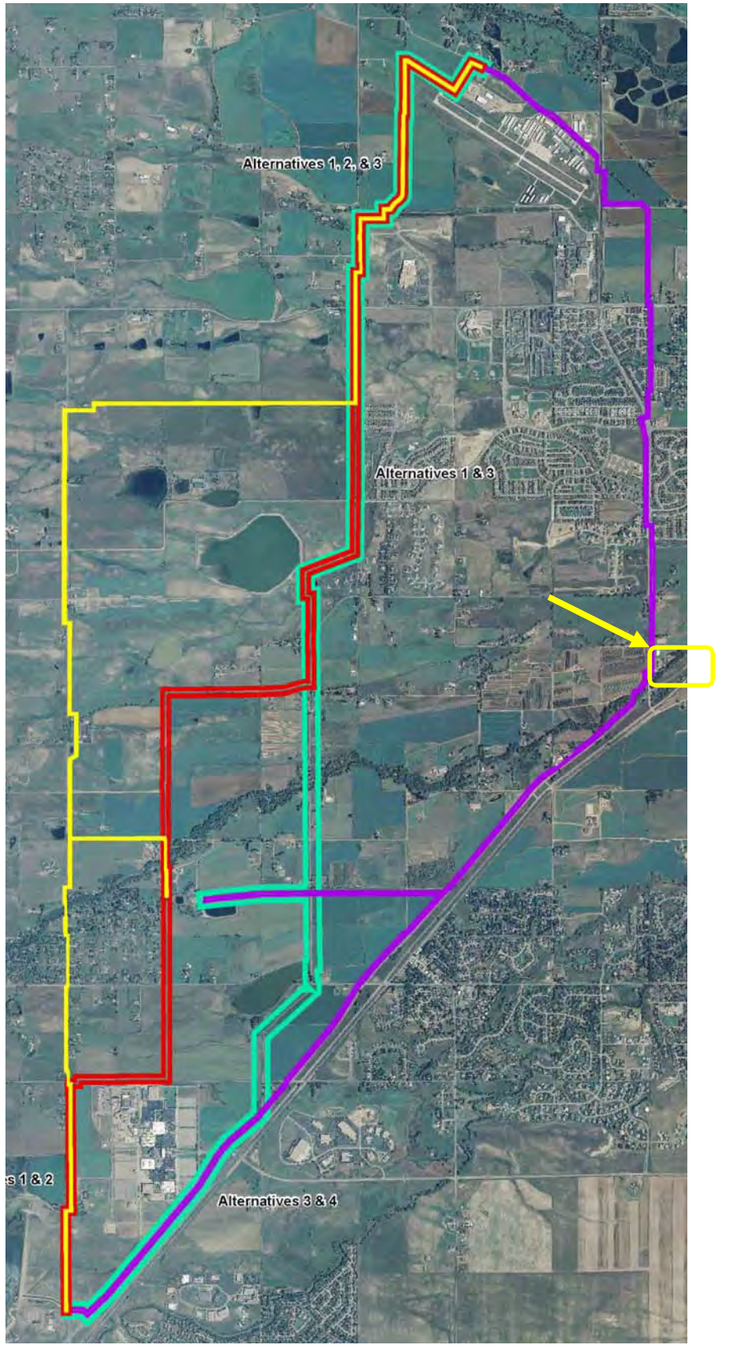


Alternative 4 runs southwest, paralleling SH 119 on the north side. A pipeline spur heads west toward the Dodd Water Treatment Plant along County Road 30. Alternative 4 continues paralleling SH 119 toward Boulder Reservoir. A fiber-optic line was recently installed within the middle of the SH 119 ROW leaving little room for other utilities.



Looking west at the junction of SH 119 and County Highway 30, Alternative 4 splits to the west toward the Dodd Water Treatment Plant and southwest to Boulder Reservoir.

SWSP I is located along SH 119 just east of Airport Road and Left Hand Creek's crossing under SH 119. Crossing under Airport Road is heavily congested and the pipeline would need to cross further to the north.



Looking west at the junction of SH 119 and Left Hand Creek, there is not enough room to install a pipeline south of Left Hand Creek.

Crossing through this area would require the pipeline cross Left Hand Creek at this location three times.

Figure 13

Airport Rd / Left Hand Creek Crossing Considered But Rejected

Southern Water Supply Project

Northern Colorado Water Conservancy District

AECOM

Southern Water Supply Project II

Boulder County

1041 Application

Prepared for:
Northern Colorado Water Conservancy District,
Acting by and through the
Southern Water Supply Project Water Activity Enterprise

In Partnership with:
City of Boulder
Left Hand Water District
Longs Peak Water District
Town of Frederick

Submitted to:
Boulder County
2045 13th Street
Boulder, CO 80302

Prepared by:

AECOM
240 East Mountain Avenue
Fort Collins, CO 80524

March 18, 2011

Table of Contents

APPENDICES

List of Maps

List of Tables

List of Figures

List of Photographs

Introduction

This document provides documentation for the Boulder County 1041 review for the Southern Water Supply Project (SWSP II) proposed by the Northern Colorado Water Conservancy District (Northern Water), acting by and through the Southern Water Supply Project Water Activity Enterprise. SWSP II is a planned water transmission pipeline, beginning at Carter Lake in Larimer County and extending south into Boulder County, with a terminus near Boulder Reservoir. The northern portion of the pipeline within Boulder County will parallel the original SWSP pipeline (constructed in 1995). From a point near Vance Brand Municipal Airport in Longmont, the proposed pipeline route diverges from the alignment of SWSP and follows a new alignment requiring the acquisition of new permanent and temporary construction easements. Beginning with a 60- inch pipe in the first leg paralleling West CR 8E in Larimer County, the pipeline transitions to a 45-inch diameter pipe at the first southern turn and progressively decreases in diameter at each turnout. Due to the heavy congestion of utilities paralleling West CR 8E, it was decided to install a larger 60-inch line through this segment to minimize the need to install an additional line if a future project required it. However, most of the pipeline alignment from this point south through Boulder County would be 45 inches in diameter or less and will serve Left Hand Water District (LHWD) and the City of Boulder.

Another element of the project known as the “eastern turnout” is a segment extending east from the main SWSP II pipeline, from a point approximately 0.5 mile west of the intersection of 87th Street and Vermillion Road, to the Weld County line. This pipeline, which will serve the Longs Peak Water District (LPWD), and Town of Frederick, has a diameter of 24-26 inches, and will be located within and adjacent to the easement of the existing SWSP pipeline that serves the City of Fort Lupton, Town of Hudson, City of Fort Morgan and Morgan County Quality Water District.

This submittal begins with a description of the proposed project and continues with a discussion of the relevant provisions of the Boulder County, Article 8, Location & Extent Areas & Activities of State Interest (1041). Portions of this project that fall within Larimer and Weld counties are not covered by 1041 requirements and are therefore not discussed in great detail. Although some detailed information, such as typical cross-section illustrations, is provided in this document, it is only intended to indicate one of several possible solutions. A detailed project design will be performed in subsequent phases of the project process.

I. Application Form

Boulder County Land Use Department
Courthouse Annex Building
2045 13th Street • PO Box 471
Boulder, Colorado 80302
Phone. 303-441-3930 • Fax: 303-441-4856
Email planner@bouldercounty org •
http://www.BoulderCounty org/lu/
Office Hours Monday — Friday 8 00 AM to 4.30 PM

Shaded Areas for Staff Only
Intake Stamp

Application Form

Project Number		Project Name	
* No Application Deadline	* Application Deadline: First Wednesday of the Month	* Application Deadline: Second Wednesday of the Month	
☐ Limited Impact Special Use ☐ Limited Impact Special Use Waiver ☐ Site Plan Review ☐ Site Plan Review Waiver ☐ Subdivision Exemption ☐ Exemption Plat ■ 1041 State Interest Review ☐ Other:	☐ Variance ☐ Appeal	☐ Sketch Plan ☐ Preliminary Plan ☐ Final Plat ☐ Resubdivision (Replat) ☐ Special Use/SSDP	☐ Rezoning ☐ Road/Easement Vacation ☐ Location and Extent ☐ Road Name Change

Location(s)/Street Address(es) Southern Water Supply Project II - Pipeline from Carter Lake in Larimer County to Boulder Reservoir.				
Subdivision Name				
Lot(s)	Block(s)	Section(s)	Township(s)	Range(s)
Area in Acres	Existing Zoning	Existing Use of Property		Number of Proposed Lots
Proposed Water Supply		Proposed Sewage Disposal Method		

Applicants:

Applicant/~~Property Owner~~: Southern Water Supply Enterprise			Email Address: cbrouwer@ncwcd.org	
Mailing Address: Carl Brouwer, North.Colo.Water Cons.Dist., 220 Water Avenue				
City: Berthoud	State: CO	Zip Code: 80513	Phone: 970-622-2298	Fax: 970-532-0942
~~Applicant/Property Owner/Agent~~/Consultant: Rosi Dennett, Strategic Planning, Inc.			Email Address: rosiplanning@yahoo.com	
Mailing Address: 3665 Smuggler Place				
City: Boulder	State: CO	Zip Code: 80305	Phone: 303-499-0619	Fax:
~~Agent~~/Consultant: John Ko, AECOM			Email Address: john.ko@aecom.com	
Mailing Address: 240 East Mountain Avenue				
City: Fort Collins	State: CO	Zip Code: 80524	Phone: 970-484-6073	Fax: 970-484-8518

Certification: *(Please refer to the Regulations and Application Submittal Package for complete application requirements)*

I certify that I am signing this Application Form as an owner of record of the property included in the Application. I certify that the information and exhibits I have submitted are true and correct to the best of my knowledge I understand that all materials required by Boulder County must be submitted prior to having this matter processed. I understand that public hearings or meetings may be required I understand that I must sign an Agreement of Payment for Application processing fees and that additional fees or materials may be required as a result of considerations which may arise in the processing of this docket. I understand that the road, school, and park dedications may be required as a condition of approval.

I understand that I am consenting to allow the County Staff involved in this application or their designees to enter onto and inspect the subject property at any reasonable time, without obtaining any prior consent.

All landowners are required to sign application. If additional space is needed attach additional sheet signed and dated.

Signature of Property Owner: Dan Carlson	Date: 2-23-11	Signature of Property Owner	Date
Other Signature	Date	Other Signature	Date

* Only if the Land Use Director waives the landowner signature requirement for good cause shown under the applicable provisions of the Land Use Code

II. Application Submittal, Processing, and Referrals

Boulder County Land Use Department Planning Publications

Submittal Requirements

Please include a copy of this form with your application. For general information about preparing referrals, please read "Referral Packet Mailing Guidelines"

This section to be filled out by the preapplication planner

Planner Name: Pete Fogg
Pre-application Date: 4/15/08
Project Name: Southern Water Supply Project II
Process Type: Article 8 Areas + Activities

Application Materials

The following information may be required, depending on the type of proposal. Please indicate that the information has been enclosed with your application and referral packets by checking the box labeled "Attached."**(Article 3-203 of the *Land Use Code* has detailed information about application materials)**

#	Materials	Planner initials	Required	Attached
1	Application Form	PLF	✓	
2	Adjacent Property Owner List	"	✓ 500'	
3	Building Plans/Elevation Drawings	"	✓	
4	Development Agreement			
5	Development Report (8-507)			
6	Engineering Reports*	"	✓	
7	Exemption Map			
8	Final Plan Map			
9	Letter of Credit			
10	Preliminary Plan Map			
11	Referral Packets	"	✓	
12	Service Area Description	"	✓	
13	Site Plan	"	✓	
14	Service Area Description			
15	Site Plan			
16	Sketch Plan Map			
17	Vicinity Map	"	✓	
18	Other: Reductions of 3+13	"	✓	
19	Other: Response to 8-507 et seq.		✓	
20	Other: Exec summary of #19		✓	

see # 19 below

may combine

need list → 21 Title Work
a minimum → 22 Landowner (inc. County Transpo, Parks, other public/quasi public) signatures ✓

may → easements, other permissions will be for completion of approval

Referral Agencies

The materials identified in the chart above by the pre-application planner must be included in your referral packets. You will be required to prepare referral packets for the agencies in the attached list, as directed by the pre-application planner.

Certification

I certify that all required materials are properly in the referral packets for the above application, and that packets have the proper mailing and first class postage. I understand that error in preparation of the packets may result in a delay in processing the application.

Applicant's Signature: _____ Date: _____

Please Print Name: _____ Phone: _____

*** Engineering Reports**
Engineering reports must be certified by a licensed P.E. Depending on the type of application, an Engineering Report will include, Plan & Profile, soils characteristics, earthwork manipulations & calculations, drainage plans, geotechnical evaluations, and traffic reports. If you are required to submit an Engineering Report, please discuss the details of the report with your planner.

This document prepared by:
Boulder County Land Use Dept.
Courthouse Annex, 13th & Spruce St.
PO Box 471; Boulder, CO 80306
Phone: (303) 441-3930
Fax: (303) 441-4856
Web Site:
http://www.co.boulder.co.us/lu/
E-mail: planner@co.boulder.co.us

Office Hours:
Monday through Friday
8:00 AM to 4:30 PM

Boulder County

Boulder County
Land Use Department
Publications

Referral Agencies

Land Use Department
Courthouse Annex Building
2045 13th Street
PO Box 471
Boulder, CO 80302

Planning Division:
Phone: 303-441-3930
Fax: 303-441-4856
Email: planner@co.boulder.co.us
http://www.co.boulder.co.us/lu/

Office Hours:
Monday – Friday 8:00 AM to 4:30 PM

Referral Agencies

Below is a list of agencies and interests along with their addresses. The planner at your pre-application conference will go through this list and reference items from your **Submittal Requirements Form** to be included in your **Referral Packet** that are required to be sent to the agencies referenced by the **Submittal Materials Table** item number. If the line in front of the agency is blank, then no referral is required.

All — **Land Use Copy**
Inter-County Mail

13/17, 6 — **Dave Webster**
Water Resources Engineer/Floodplain Administrator
Boulder County Transportation Department
Inter-County Mail

1, 3, 6, 13/17, 18, 19, 22 — **Anita Riley • Justin Gindlesperger**
Boulder County Transportation Department
Inter-County Mail

Referrals for Conservation Easements

1, 13/17, 18, 19, 22 — **Janis Whisman**
Boulder County Parks/Open Space Dept.
Inter-County Mail

1, 3, 6, 13/17, 20 — **Jeff Dwight, Chief Bldg Official**
Boulder County Land Use Building Division
Inter-County Mail

_____ — **Pete Fogg**
Boulder County Land Use Long Range Planning Division
Inter-County Mail

1, 18, 19 — **Barbara Andrews**
Boulder County Attorney's Office
Inter-County Mail

1, 3, 6, 13/17, ~~18~~ 19 — **Iris Sherman**
Boulder County Public Health
Inter-County Mail

1, 13/17, 20 — **Eric Philips**
Boulder County Land Use Wildfire Mitigation Coordinator
Inter-County Mail

1, 13/17, 18, 20 — **Denise Grimm**
Boulder County Land Use Historic Review
Inter-County Mail

1, 3, 13, 20 — **Tim Damato**
Weed Inspector
Boulder County Parks & Open Space Department
Inter-County Mail

1, 18, 20, 21, ~~22~~ — **Boulder County Assessor**
Inter-County Mail

1, 3, 6, 13/17, 19 — **Ron West**
Boulder County Parks & Open Space Department
Inter-County Mail
Phone: 303-527-0416

_____ — **Dan Hershman**
Boulder County Road Maintenance Department
Inter-County Mail

1, 13/17, 20 — **Lt. Phil West**
Boulder County Sheriff's Department
Inter-County Mail

_____ — **Boulder County Treasurer**
Inter-County Mail

_____ — **Nancy McIntyre**
District Manager
Boulder Valley & Longmont Conservation Districts
9595 Nelson Road, Box D
Longmont, CO 80501
Phone: 303-776-4034 ext. 3

1, 13/17 — **Jason Emery**
Boulder County Surveyor
Boulder Land Consultants
5690 Valmont
Boulder, CO 80301
Phone: 303-441-1665

1, 13/17, 20 — **Colorado State University**
Cooperative Extension Office
9595 Nelson Road, Box B
Longmont, CO 80501
Phone: 303-776-4865

Referral Agencies List

_____ **Other Boulder County Agencies:**

_____

_____

_____

_____

1/13/17, 20 **Adjacent Property Owners within ~~500~~ 750 feet.**

_____

_____

_____

_____

1/13/17, 20 **Homeowners Associations or Related Groups** where id'd (Clerk + Recorder)

_____

_____

1/13/17, 20 **Anyone with legal interests in the property as indicated in Title Report (such as lien holders or mortgage companies)**

_____

_____

_____

_____

_____ **Allenspark Concerned Citizens**
Attn: Bob Donovan
PO Box 336
Allenspark, CO 80510
Note: Send referral for projects along Peak to Peak from Peaceful Valley North of the county limit.

_____ **Allenspark Water & Sanitation District**
Attn: Tom Street
PO. Box 91
Allenspark, CO 80510

_____ **Arapaho and Roosevelt National Forests & Pawnee National Grassland**
Christine M. Walsh, Dist. Ranger
Boulder Ranger District
Phone: 303-541-2500
Email: cwalsh@fs.fed.us
or,
Nancy Fetterman, GIS
Phone: 303-245-6418

_____ **Audubon Society (Boulder County)**
Attn: Board of Review
P.O. Box 2081
Boulder, CO 80306

_____ **Boulder Valley School District**
Attn.: Don Orr
PO Box 9011
Boulder, CO 80306
Phone: 303-447-5062

1/13/17, 18, 20 ? **Boulder and White Rock Ditch Reservoir Company**
Dan Grant,
Secretary/Treasurer
P.O. Box 1826
Longmont CO 80502-1826
+ where approp

_____ **Bureau of Land Management**
Attn: Jan Fackrell
Northeast Resource Area
3170 E. Main Street
Canon City, CO 81212-9326

1/13/17, 18, 20 ? **Burlington Northern & Santa Fe Railway Co.**
Property & Facilities Management
Attn: Director of Field Operations
PO Box 961050
Ft. Worth, TX 76161-0050
↓ where affected

_____ **Citizens for Eldorado Canyon**
Eric Johnson
32 Artesian Drive
Eldorado Canyon, CO 80025
Note: This is an invalid Address per Post Office must be a PO Box

_____ **Coal Creek Canyon Improvement Association**
Attn: Tom Hoffman
11578 Ranch Elsie Road
Golden, CO 80403
Note: Send Referrals for All Projects in Coal Creek Canyon Area.

1/13/17, 18, 20 **Claire Solohub****
District Wildlife Manager
CO Division of Wildlife
Area 2
Dept. of Natural Resources
4207 West County Rd. 16E
Loveland, CO 80537
North Boulder Office
Phone: 303-828-2591
VoiceMail: 303-291-7142
Email:
Claire.solohub@state.co.us
Note: Any projects located North of Arapahoe Road and North Boulder should go to Loveland Office.

_____ **John Koehler****
District Wildlife Manager
CO Division of Wildlife
Area 2
Dept. of Natural Resources
13161 Bryant Cr.
Broomfield, CO 80020
Note: Any projects South of Arapahoe Road and South of the Boulder Hwy. should go to Broomfield Office.

_____ **CO Forest Service**
Attn: Allen Owens
5625 Ute Hwy.
Longmont, CO 80503
Phone: 303-823-5774
Fax: 303-823-5768

For Geologic Hazards

1/13/17, 20 **CO Geological Survey**
CO Natural Resources Dept.
1313 Sherman
Room 703
Denver, CO 80203

_____ **CO Dept. of Local Affairs**
Attn: Charles T. Unseld
Division of Local Government
1313 Sherman Street
Room 521
Denver, CO 80203

_____ **CO Mined Land Reclamation Division (MLRD)**
1313 Sherman
Room 215
Denver, CO 80203

Referral Agencies List

_____ **CO Natural Areas Council**
c/o, CO State Parks
Attn: Janet Coles
1313 Sherman Street
Room 618
Denver, CO 80203

For Mineral Extractions

_____ **CO Natural Resources Dept of Division of Minerals and Geology**
1313 Sherman St
Denver, CO 80203-2236
Phone: 303-866-3567
Fax: 303-866-2696

_____ **CO Natural Resources Dept of Soil Conservation Board For Watershed & Soil Protection**
700 Kipling Street
Suite 400
Lakewood, CO 80215-8000

For Oil & Gas Development

_____ **CO Natural Resources Dept of Oil & Gas Conservation Commission**
1120 Lincoln St
Denver, CO 80203-2136
Phone: 303-894-2100
Fax: 303-866-2696

For Floodplains

_____ **CO Natural Resources**
Department of Water Conservation Board
1313 Sherman St
Denver, CO 80203-2236
Phone: 303-866-3441
Fax: 303-866-2696

1, 13/17, 18, 20 where affected **CO Natural Resources Department**
State Engineer
1313 Sherman, Rm. 802
Denver, CO 80203

For Records of Older Permits:

Records
M - F 10am - 3:30pm
Phone: 303-866 3447

For Technical Questions, Application Status, Current Permit Info:

Groundwater
Phone: 303-866 3581

1, 6, 13/17, 18, 20 where affected **CO Transportation Department R4**
Attn: Gloria Hice-Idler, Access Manager
1420 Second Street
Greeley, CO 80631
Phone: (970) 350-2148
Email:
Gloria.Hice-Idler@dot.state.co.us

_____ **Eldorado Canyon State Park**
9 Kneale Road, Box B
Eldorado Springs, CO 80025
Phone: 303-494-3943
Email:
eldorado.park@state.co.us

_____ **Eldora Civic Association**
Attn: Deb Evans
P.O. Box 988
Nederland, CO 80466

_____ **Energy Resources Technology**
Land (ERTL) Inc.
229 Terry Street
Longmont, CO 80501-5930

_____ **ESSA - Quiet Zone US Department of Commerce**
Inst. of Telecommunication Science (NTIA/ITS)
Attn: Val O' Day, Acting Director
325 Broadway
Boulder, CO 80305

_____ **Gold Hill Zoning & Historic District**
661 Pine Street (Gold Hill)
Boulder, CO 80302
Note: Send Referrals for All Projects in Gold Hill Area.

_____ **Greater Allenspark Alliance**
Attn: Phil Stern
P.O. Box 56
Allenspark , CO 80510
Note: Send referral for projects along Peak to Peak from Peaceful Valley to the county limit, and along Big Owl Road and Cabin Creek

_____ **Chris Horvak**
2131 E. Panama Drive
Littleton, CO 80121
Note: Include on all SD Applications.

1, 13/17, 20 **H.B. 1088 (Severed Mineral Rights)**
Compliance Certificate Required

_____ **Lake Eldora Corporation**
PO Box 1697
Nederland, CO 80466

_____ **Lake Eldora Water & Sanitation**
Box 1378
Nederland, CO 80466

1, 13/17, 18, 20 where affected **Left Hand Water District**
Attn: Kathy Peterson
P.O. Box 210
Niwot, CO 80544

1, 13/17, 18, 20 **Little Thompson Water District** ?
835 East Hwy. 56
Berthoud, CO 80513

1, 13/17, 20 **Longs Peak Water District** ?
9875 Vermillion Road
Longmont, CO 80501

_____ **MOST**
Attn: Phil Stern
PO Box 56
Allenspark, CO 80510
Note: Mountain Area Referrals/Issues

_____ **Nature Conservancy of Colorado**
The Canyon Center
1881 9th Street, Suite 200
Boulder, CO 80302
Phone: 303-444-2950

_____ **Niwot Business Association**
Attn: Bruce Warren
P.O. Box 92
Niwot, CO 80544

_____ **Niwot Community Association**
Attn: Neal Anderson
PO Box 72
Niwot, CO 80544
Phone: 303-652-3099

_____ **Niwot Design Review Subcommittee**
Attn: Pat Murphy
Niwot Real Estate
102 2nd Avenue
PO Box 340
Niwot, CO 80544
Note: Send Referrals for All Projects in Niwot Rural Community District.

Referral Agencies List

1/13/17, 20 **Niwot Sanitation District**
Attn: Gayle
Packard-Seeburger
7395 N. 95th Street
Niwot, CO 80503
Phone: 303-652-2525

_____ **Northern Colorado Water**
Conservancy District
1250 N. Wilson Ave
Loveland, CO 80538-4461

_____ **Patina Oil & Gas Corporation**
Attn: Brendt Myhr
1625 Broadway, Suite 2000
Denver, CO 80202
Phone: 303-389-3600

_____ **Pine Brook Water District**
Attn: Bob De Haas
1903 Linden Drive
Boulder, CO 80304

1/13/17, 20 **Qwest Communications**
Attn: Kathy Dunbar
1855 S. Flatiron Ct. #B-01
Boulder, CO 80301

_____ **Rocky Mountain National Park**
Attn: Superintendent
Estes Park, CO 80517

_____ **St. Vrain Valley Schools**
Attn: Planning & Evaluation
395 S. Pratt Pkwy.
Longmont, CO 80501

_____ **U.S. Bureau of Reclamation Department of Interior**
Eastern Colorado Area Office
11056 West County Rd. 18E
Loveland, CO 80537

_____ **US Army Corps of Engineers Omaha District**
Attn: Terry McKee
Denver Regulatory Office
9307 S. Wadsworth Blvd.
Littleton, CO 80128-6901

_____ **US Dept of Commerce**
National Telecommunications & Information Administration/Institute for Telecommunications Sciences
Attn: A. W. Vincent
325 Broadway
Boulder, CO 80305

1/13/17, 20 **US Fish & Wildlife Service/Ecological Services/Colorado Field Office**
Attn: Susan Linner, Field Supervisor
PO Box 25486
DFC (MS 65412)
Denver, CO 80225-0486
Phone: 303-236-4773
Fax: 303-236-4005

_____ **U.S. Forest Service**
Attn: Land Staff
2140 Yarmouth
Boulder, CO 80301

_____ **US Post Offices in Boulder County**
- ❑ Allenspark 80510
- ❑ Berthoud 80513
- ❑ Boulder 80302
- ❑ Broomfield 80020
- ❑ Eldorado Springs 80025
- ❑ Hygiene 80533
- ❑ Jamestown 80455
- ❑ Lafayette 80026
- ❑ Longmont 80501
- ❑ Louisville 80027
- ❑ Lyons 80540
- ❑ Nederland 80466
- ❑ Niwot 80544
- ❑ Ward 80481

_____ **Western Area Power Administration (WAPA)**
Rocky Mountain Region
Attn: Carrie Ashto
PO Box 3700
Loveland, CO 80539

1/13/17, 20 **Xcel Energy (PSCo)**
Contract ROW Processor
550 15th Street, Ste. 700
Denver, CO 80202
Phone: 303-571-7029
Fax: 303-571-7877

1/13/17, 20 **Other Affected Water Suppliers** ?

1/13/17, 20 **Other Affected Utilities** ?

1/13/17, 18, 20 → where approp. **Affected Ditch Companies**

_____ **Affected Fire Districts** 1/13/17, 20

✓ **Cities/Towns Within 3 Miles**

✓ **City/Town Community Service Areas (CSAs) Within 3 Miles**

✓ **Other Counties Within 3 Miles**

_____ **Other State Agencies**

_____ **Other Federal Agencies**

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1, 13/17, 20

Additional Referral Agencies

Utilities

Estes Park Power & Light
211 E. Elkhorn Ave.
Estes Park, CO 80517

Poudre Valley REA
PO Box 272550
Fort Collins, CO 80527-2550

Xcel Energy (PSCo) Contract ROW Processor
550 15th Street, Suite 700
Denver, CO 80202
Phone: 303-571-7029
Fax: 303-571-7877

For Properties in the Plains:

United Powers, Inc.
18551 East 160th Avenue
Brighton, CO 80601

For Properties in the Mountains:

United Power, Inc.
Attn: Randy Christianson
95 Gross Dam Road
Golden, CO 80403

Western Gas Supply Co.
500 Prudential Plaza
1050 17th St.
Denver, CO 80265-0501

District 6 Water Users Assn.
Attn: Robert Brand
9595 Nelson Road, Box C
Longmont, CO 80501

Northern Colorado Water Conservancy District
P.O. Box 679
Loveland, CO 80537

St. Vrain & Left Hand Water Conservancy District
9595 Nelson Rd.
Box C, Suite. 203
Longmont, CO 80501

Urban Drainage & Flood Control District
2480 W. 26th Ave.
Denver, CO 80211

Cities/Counties

Adams County Planning Department
12200 N. Pecos Street,
3rd Floor
Westminster, CO 80234
Planning & Development:
Phone: (303) 453-8800;
Fax: (303) 453-8829
Public Works/Building:
Phone: (303) 453-8700;
Fax: (303) 453-8711
Public Works/Engineering:
Phone: (303) 453-8787;
Fax: (303) 453-8775

City of Boulder Planning & Development Services
Attn: Susan Richstone
Park Central Building
1739 Broadway, 3rd Floor
Boulder, CO 80302
Phone: (303) 441-1880
Mailing Address:
PO Box 791
Boulder, CO 80306-0791

City of Boulder Open Space/Real Estate Department
Attn: Ann Goodhart
66 South Cherryvale Road
Boulder, CO 80303
cc: Mike Patton
PO Box 791
Boulder, CO 80306

City and County of Broomfield Planning Department
1 Des Combes Drive
Broomfield, CO 80020
Phone: (303) 438-6284;
Fax: (303) 438-6297

Erie Planning Department
Attn: Hallie Sawyer
PO Box 750
Erie, CO 80516
Phone: (303) 926-2770;
Fax: (303) 926-2706

Gilpin County Planning Department
The Old Courthouse
203 Eureka St.
2nd & 3rd Floors
Mailing Address:
P.O. Box 661
Central City, CO 80427
Phone: (303) 582-5831
or 582-5214;
Fax: (303) 565-1796

Grand County Planning Department
308 Byers Ave.
Hot Sulphur Springs, CO 80451
Phone: 970-725-3347
ext. 129
Fax: (970) 725-3303
Mailing Address:
PO Box 239
Hot Sulphur Springs, CO 80451

Jamestown Planning Department
Attn: Mary Ellen Birch
PO Box 298
Jamestown, CO 80455

Jefferson County Planning Department
100 Jefferson Pkwy.,
Suite 3550
Golden, CO 80419
Phone: (303) 271-8700

City of Lafayette
Attn: Phillip Patterson, AICP
Director of Planning & Building
1290 S. Public Road
Lafayette, CO 80026
Phone: 303-665-5506
ext. 3330
Fax: 303-665-2153

Larimer County Planning Department
200 W. Oak St., 3rd Floor
Fort Collins CO 80521
Phone: (970) 498-7683;
Fax: (970) 498-7711
Mailing Address:
P.O. Box 1190
Ft. Collins, CO 80522

Longmont Planning & Development Services Division
Attn: Froda Greenberg
Civic Center Complex
350 Kimbark St.
Longmont, CO 80501

Louisville Planning Department
749 Main St.
Louisville, CO 80027
Phone: (303) 666-6565;
Fax: (303) 335-4550

Town of Lyons
Attn: Terri Andrews
PO Box 49
Lyons, CO 80540

Lyons Planning Consultant
Attn: Don Kock
621 Monroe St.
Denver, CO 80206

Nederland Planning Department
P.O. Box 396
Nederland, CO 8046

Town of Superior Planning Department
Attn: Scott Randall
124 E. Coal Creek Drive
Superior, CO 80027
Phone: (303) 499-3675;
Fax: (303) 499-3677

Ward Planning Department
PO Box 99
Ward, CO 80481-0099

Weld County Planning Department
915 10th St.
Greeley, CO 80631
Phone: (970) 353-6100
ext. 3540;
Fax: (970) 304-6498

1, 13/17, 20

Fire Protection Districts

Allenspark FPD
Attn: Mike Osmum
PO Box 153
Allenspark, CO 80510
Phone: 303-747-2586

Berthoud FPD
Attn: Stephen Charles, Fire Marshall
275 Mountain Ave
PO Box 570
Berthoud, CO 80513
Phone: 970-532 2264

Big Elk Meadows FPD
Attn: Gerry Guthrie
PO Box 474
Lyons, CO 80540
Phone: 303-823-6369

(BCFFA) Boulder County Fire Fighters' Association
Attn: Brett Gibson
91 Four Mile Canyon Rd.
Boulder, CO 80302

Boulder Mountain Fire Authority
(f.k.a. Boulder Heights FPD & Pine Brook Hills FPD)
Attn: John Benson, Chief
1905 Linden Drive
Boulder, CO 80304
Phone: 303-440-0235

X **Boulder Rural FPD**
Attn: Jeff Webb
5075 Jay Road
Boulder, CO 80301
Phone: 303-530-9575 ext. 105
Email: jeff.webb@BRFD.org

X **City of Boulder FPD**
Attn: Larry Donner, Chief
PO Box 791
Boulder, CO 80306
Phone: 303-441-3357

City of Boulder Mountain Parks
Attn: J. Scholl, Ranger Supervisor
PO Box 791
Boulder, CO 80306

Coal Creek Canyon FPD
Attn: Janice Miklovic
PO Box 7187
Golden, CO 80403
Phone: 303-647-3121

Four Mile FPD
Attn: Bret Gibson, Chief
87 Four Mile Canyon
Boulder, CO 80302
Phone: 303-444-0882

Gold Hill FPD
Attn: Chris Finn, Chief
1011 Main Gold Hill
Boulder, CO 80302
Phone: 303-444-5549

High Country FPD
Attn: Roger Durham, Chief
448 Pine Drive
Rollinsville, CO 80474
Phone: 303-642-3655

X **Hygiene FPD** ?
Attn: A.J. Hoffman
PO Box 83
Hygiene, CO 80533
Phone: 303-776-2950
Email: xbar7@msn.com

Indian Peaks FPD
Attn: Norman Bowers, Chief
PO Box 173
Ward, CO 80481
Phone: 303-459-3452

Jamestown Volunteer Fire District
Attn: Chris O'Brien, Chief
PO Box 315
Jamestown, CO 80455
Phone: 303-587-2709

Lafayette FPD
Attn: John Mansfield, Fire Marshall
PO Box 68
Lafayette, CO 80026
Phone: 303-665-9661

Lefthand FPD
Attn: Dave Nyquist, Chief
900 Lefthand Canyon Drive
Boulder, CO 80302-9341
Phone: 303-447-9661

X **Longmont City Fire Bureau**
Attn: Steve Trunck, Chief
225 Kimbark St.
Longmont, CO 80501
Phone: 303-651-8474

Louisville FPD
Attn: Tim Parker, Chief
895 West Via Appia
Louisville, CO 80027
Phone: 303-656-6595

Lyons FPD
Attn: Dennis Moe, Chief
PO Box 695
Lyons, CO 80540
Phone: 303-823-6611

X **Mountain View FPD**
(Longmont Rural FPD)
Attn: Luanne Penfold, Fire Marshall
9119 East County Line Road
Longmont, CO 80501-8955
Phone: 303-772-0710
Email: LPenfold@mountainviewfire.org

Nederland FPD
Attn: Rick Dirr, Chief
PO Box 155
Nederland, CO 80466
Phone: 303-258-9161

North Metro Fire Rescue Headquarters
10550 Huron Street
Northglenn, CO 80234
Phone: 303-452-9910
Fax: 303-451-0289

Pinewood Springs FPD
61 Kiowa
Lyons, CO 80540
Phone: 303-823-5086

Rocky Mountain Fire Authority Eldorado Springs/Marshall FPD & Cherryvale FPD
Attn: Ray Proulx
Cherryvale Station 1
7700 Baseline Road
Boulder, CO 80303
Phone: 303-494-3735
Email: rproulx@rockymountainfire.org

Poorman Volunteer Fire Department
Sunshine Star Route
Boulder, CO 80302

Sugarloaf FPD
Attn: Sally Stoffel, Chief
1360 Sugarloaf Road
Boulder, CO 80302
Phone: 303-442-1050

Sunshine FPD
Attn: Steve Stratton, Chief
311 County Road 83
Boulder, CO 80302
Phone: 303-786-7731

Sunshine FPD
Attn: Bruce D. Honeyman
Assistant Chief & Fire Marshall
6101 Sunshine Canyon
Boulder, CO 80302
Phone: 303-273-3420

West Metro FPD
447 South Allison Pkwy
Lakewood, CO 80226

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1, 13/17, 20 where affected

Community & Homeowner Associations

¤ = HOA's are in Unincorporated Boulder County.

¤ **Bar K Ranch HOA**
1180 Rock Lake Rd.
Ward, CO 80481

¤ **Benchmark HOA**
#12 Benchmark Drive
Boulder, CO 80301

Blue Heron HOA Association
525 Canyon Blvd
Boulder, CO 8032-5029

Boulder County Bar Association
1942 Broadway
Boulder, CO 80301
303-440-4758

Boulder County Home Builders Association
7960 Niwot Rd.
Longmont, CO 8050
Phone: 303-530-0332

¤ **Boulder Hills HOA**
Attn: Tim Black
8498 Stirrup Ct.
Longmont, CO 80503

¤ **Boulder Tech Center**
Owners Association
2729 S. Lakeridge Trail
Boulder, CO 80302-9312

¤ **Brittany Place HOA**
Attn: Gene Hemmerle
8440 Brittany Place
Longmont, CO 80503

¤ **Burgundy Park HOA**
a.k.a. Johnson Farm Replat G
PO Box 323
Niwot, CO 80544

¤ **Canyonside HOA**
PO Box 1698
Boulder, CO 80306

Centennial Meadows HOA
2503 Norwood Ave
Boulder, CO 80304

Chicken Hill Road HOA
Attn: Ed Dawson
450 Rim Road
Boulder, CO 80302

Clover Creek Owners Assn.
1938 Pearl Street, Suite 200
Boulder, CO 80302

Cobblestone Court HOA
1437 Lodge Lake
Boulder, CO 80303

Continental View HOA
PO Box 185
Louisville, CO 80027

¤ **Cottonwood Park West HOA**
6935 Conifer Ct.
Longmont, CO 80544
or,
PO Box 421
Niwot, CO 80544

¤ **Country Creek HOA**
P.O. Box 85
Niwot, CO 80544-0085
Phone: 303-652-3840

Country Fields HOA
77 Risse Court
Erie, CO 80516

¤ **Cove (The) HOA**
PO Box 1052
Niwot, CO 80544-1052

¤ **Crescent Lake Estates HOA**
584 Crescent Lake
Golden, CO 80403

¤ **Crystal Views HOA**
Attn: Nan Stuart
11732 Crystal Views Lane
Longmont, CO 80501

¤ **Darvey's Farm NUPUD Architectural Committee**
Attn: Bruce M. Davis & Mary Davis Burkhart
10142 Oxford Road
Longmont, CO 80501

Eagle Canyon Subdivision
P O Box 11
Lyons, CO 80540

East Meadowdale Association
PO Box 398
Niwot, CO 80544

Eldora Civic Association
Attn: Deb Evans
PO Box 988
Nederland, CO 80466

¤ **ERTL Farm HOA**
Attn: Ned Flannigan
9499 W Phillips Rd.
Boulder, CO 80301
Phone: 303-664-5994

¤ **Farm in Boulder Valley (The) HOA**
7490 Clubhouse Rd Ste 201
Boulder, CO 80301

¤ **Fountaintree HOA**
70 Fountaintree Lan
Boulder, CO 80304

Fourmile Creek HOA
1200 28th Street, Suite 103
Boulder, CO 80303

¤ **Gaynor Lake HOA**
10505 Oxford Rd
Longmont, CO 80501

¤ **Githens Acres**
Neighborhood Assn.
Attn: Jim Snow
2305 Topaz Drive
Boulder, CO 80304

Gold Hill Zoning District
661 Pine Street {Gold Hill}
Boulder, CO 80302

Gold Hill Historic District
661 Pine Street {Gold Hill}
Boulder, CO 80302

¤ **Goose Haven HOA**
Attn: Lynn & Nancy Ellins
10483 Goose Haven Drive
Lafayette, CO 80026

Grape Cluster HOA
710 Grape Avenue
Boulder, CO 80304

¤ **Gunbarrel Greens HOA**
Attn: Gina Hyatt
PO Box 11217
Boulder, CO 80301

¤ **Gunbarrel Estates Architectural Committee**
Attn: Joe Markham
7217 Mount Meeker Road
Longmont, CO 80503
Phone: 303-530-3676

¤ **Hardt Estates Subdivision**
Attn.: James Cayton
9302 Tollgate Drive
Longmont, CO 80503

Hawthorne Court HOA
1245 Kalmia Avenue
Boulder, CO 80304

Hawthorne Hollow HOA
3281 Hawthorne Hollow
Boulder, CO 80304

¤ **Heatherwood HOA**
P.O. Box 11102
Boulder, CO 80302

Community & Homeowner Associations (Continued)

¤ = HOA's are in Unincorporated Boulder County.

Heron Lake Meadows HOA
2527 Lake Meadows Drive
Lafayette, CO 80026

¤ **Hidden Lake HOA**
Attn: Joe Williams
139 Pine Cone
Ward, CO 80481

¤ **Hillcrest Heights Replat B**
See Wildview HOA

Hoover Hill HOA
Attn: Ricard Boscardin
993 Crestmoor Dr
Boulder, CO 80303
and,
Attn: Verle E Hansen
1146 Westview Drive
Boulder, CO 80303

¤ **Hygiene HOA**
Attn: Sam Clark
P.O. Box 171
Hygiene, CO 80533

¤ **Indian Peaks Gray Hawk HOA**
75 Manhattan Drive, Suite 1
Boulder, CO 80303

¤ **Johnson Farm Replat G**
See Burgundy Park HOA

¤ **Johnson Valley HOA**
Bruce Landreth, Secretary
PO Box 931
Niwot, CO 80544
Phone: 303-581-5062

¤ **Knollwood HOA**
Attn: Alan A. Teran
2126 Knollwood Drive
Boulder, CO 80302-4706
Phone: 303-444-6877

¤ **Lagerman Farm HOA**
3281 61st Street
Boulder, CO 80301

¤ **Lake of the Pines HOA**
Walter Katz, Chairman
2901 N. Lakeridge Trail
Boulder, CO 80302

¤ **Lakeshore Estates ARC**
Attn: Julianne M. Anderson
6397 Glenmoor Rd.
Boulder, CO 80303
Phone: 303-499-7150

¤ **Lake Valley Estates HOA**
3950 Bogey Ct.
Longmont, CO 80503
Phone: 303-545-6651

¤ **Lazy Z Estates HOA**
Attn: Ric Turley, Treasurer
PO Box 374
Pinecliffe, CO 80471-0374

¤ **Legend Ridge HOA**
5440 Ward Rd. #230
Arvada, CO 80002

Lomar HOA
380 Spruce Street
Boulder, CO 80302

¤ **Longs Peak Estates HOA**
PO Box 1141
Lyons, CO 80540-1141

¤ **Lykins Gulch HOA**
3743 Nelson Road
Longmont, CO 80503

¤ **Meadow Green Farm HOA**
14707 N. 95th Street
Longmont, CO 80501

¤ **Monarch Park HOA**
Attn: Jennifer Sleek
7376 Monarch Road
Longmont, CO 80503-8630

¤ **Monarch Ponds HOA**
7698 Estate Circle
Longmont, CO 80503

¤ **Mountain Ridge HOA**
Attn: Levin Hemming
2289 Park Lake Dr
Boulder, CO 80301-5124

¤ **Niwot Meadow Farm LLC**
Attn: Michael Markel
5723 Arapahoe Ave. Ste. 2A
Boulder, CO 80303

¤ **North Rim HOA**
4400 Hogan Ct.
Niwot, CO 80503

Nyland Community Association
3525 Nyland Way
Lafayette, CO 80026

¤ **Orange Orchard HOA**
Attn: Bullen Development Co.
PO Box 17241
Boulder, CO 80301

¤ **Oxford Farm HOA**
7600 Rodeo Drive
Longmont, CO 80501

¤ **Panorama Park Subdivision**
Architectural Review
Attn: H.O. Winters, Chair
7587 Panorama Drive
Boulder, CO 80303
Phone: 303-494-7297
or,
Frank Hawke
7331 Spring Drive
Boulder, CO 80303
Phone: 303-499-6704

¤ **Park Lake HOA**
PO Box 682
Louisville, CO 80027

¤ **Pine Brook Hills Architectural Committee**
Attn: Ken Larkin
90 Hawk Lane
Boulder, CO 80304
Email: KenLarkin@comcast.net

¤ **Pine Valley Estates HOA**
PO Box 643
Pinecliffe, CO 80471

Portico HOA Inc.
PO Box 81
Mead, CO 80542

Quail Ridge HOA Inc
2 North Cascade Ave., Suite 128
Colorado Spring, CO 80903

¤ **Quiet Retreat HOA**
2807 Jay Road
Boulder, CO 80301-1605
or,
PO Box 143
Niwot, CO 80503

Ranch at Clover Basin
Replat B TDR/PUD 2nd Filing
(a.k.a. Portico)
Attn: Stan Meade
Portico Development Companies, LLC
Design Review Committee
Phone: 720-652-9191

¤ **Silver Springs HOA**
11 Nightshade HOA
Boulder, CO 80302

¤ **Smith Meadow Lane HOA**
7376 Elm St.
Longmont, CO 80503

¤ **Sombrero Ranch HOA**
Attn: Brian Rickel
1247 Mallard Ct.
Boulder, CO 80303

Community & Homeowner Associations (Continued)

¤ = HOA's are in Unincorporated Boulder County.

¤ **Somerset Estates HOA**
Attn: Kiran Chopra, President
PO Box 105
Niwot, CO 80544
Phone: 303-506-5429

South Boulder Canyon HOA
Attn: Neil D. Blank, President
PO Box 235
Eldorado Springs, CO 80025
Phone: 303-786-9100

South Creek HOA
PO Box 3421
Boulder, CO 80307

¤ **South Meadow HOA**
PO Box 11294
Boulder, CO 80301

¤ **South Meadow Gunbarrel Green Acres**
PO Box 11294
Boulder, CO 80301

¤ **Southern Exposure HOA**
Attn: Skip Holland, President
10427 Sunlight Drive
Lafayette, CO 80026
Phone: 303-661-0095

¤ **Spanish Hills HOA**
Attn: Leo H. Jr. & Kathryn McGinnis
85 Barcelona Drive
Boulder, CO 80303

Sundance HOA
1630 30th Street, #218
Boulder, CO 80301

¤ **Sunrise Ranch NUPUD HOA**
6106 Sunrise Ranch Drive
Longmont, CO 80501

¤ **Table Mountain Association**
Attn: James S. Mays
3286 Plateau Rd.
Longmont 80503

Town & Country HOA
PO Box 2015
Longmont, CO 80502

¤ **Triple Creek Maintenance**
PO Box 35
Allenspark, CO 80510

¤ **Valle Del Rio Subdivision**
Attn: Lori Dempsey
4567 Prado Drive
Boulder, CO 80303
Phone: 303-499-7777
Mobile: 303-472-0811
Email: dempsey4567@yahooc.com

¤ **Waterford HOA**
PO Box 6632
Longmont, CO 80501

¤ **Waterstone HOA**
4875 Pearl East Circle, #300
Boulder, CO 80301
or,
CTB Services
Attn: Tom Jones
2888 Bluff, Suite 422
Boulder, CO 80303
Phone: 303-447-1336

West Meadowdale HOA
PO BOX 831
Niwot, CO 80544

¤ **Western Meadows Park HOA**
8201 Baseline Road
Boulder, CO 80303

¤ **White Hawk Ranch HOA**
5723 Arapahoe Avenue, #2A
Boulder, CO 80303

¤ **Wildview HOA**
a.k.a. Hillcrest Heights Rplt
PO Box 19439
Boulder, CO 80308-2439

Willow Creek HOA
PO Box 6714
Longmont, CO 80501

¤ **Willow Glen HOA**
8015 Brook Hollow Ct.
Boulder, CO 80301

Willow Springs HOA
2888 Bluff #422
Boulder, CO 80301

III. Submittal Requirements

A. Overview of the Proposed SWSP II Project

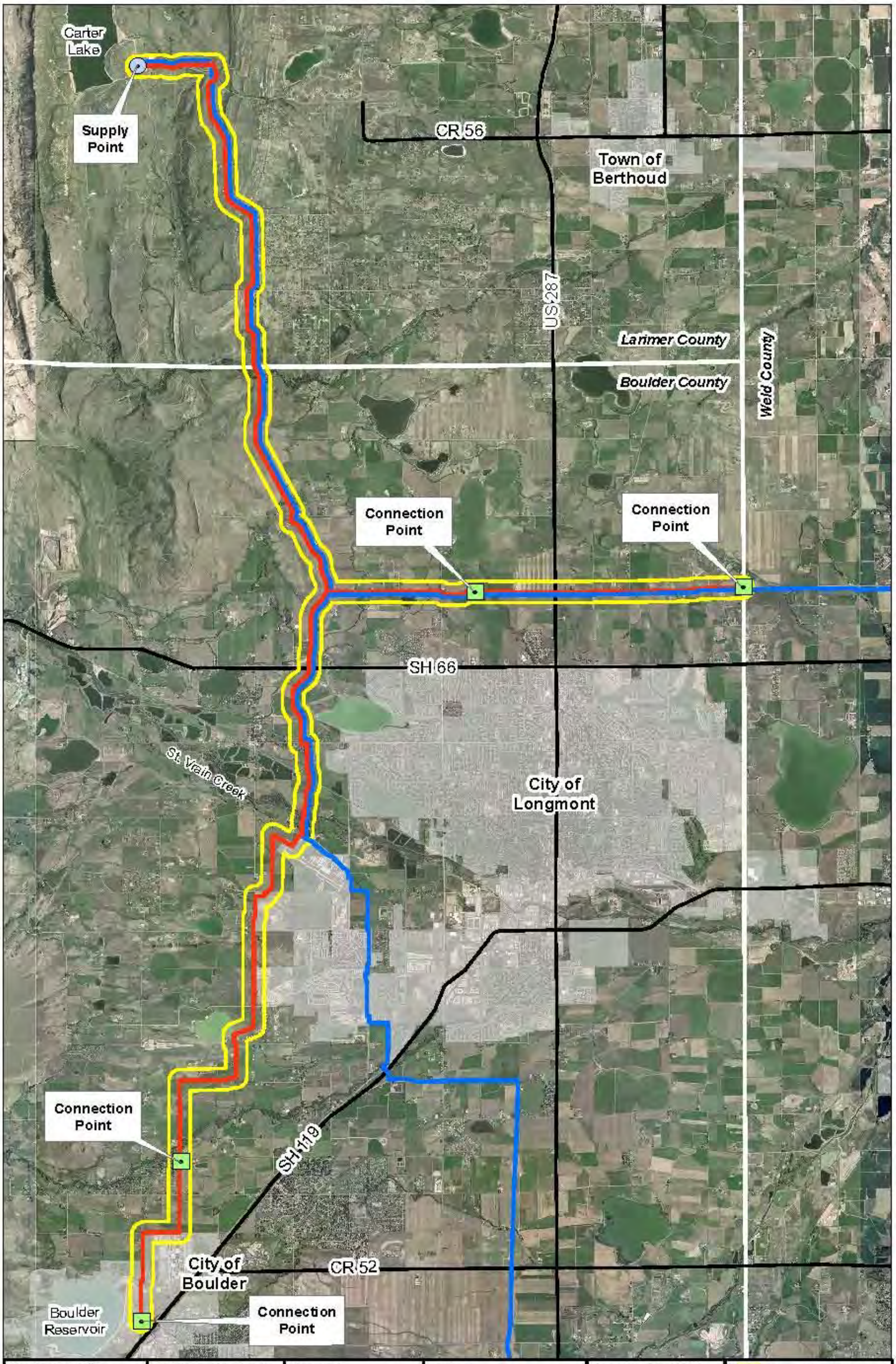
The SWSP II project will deliver Windy Gap and Colorado-Big Thompson (C-BT) Project water from the existing diversion structure on the St. Vrain Supply Canal near Carter Lake, to delivery locations that include the City of Boulder's Boulder Reservoir Water Treatment Plant (WTP) and Left Hand Water District Dodd Treatment Plant (LHWD Dodd WTP). Water will be delivered to the LPWD at its Kugel Treatment Plant on Vermillion Road. Future extensions of the eastern turnout into Weld County are expected to deliver water to a future planned delivery point for the Town of Fredrick. The project will provide improved water quality and greater reliability to the participants served in addition to meeting capacity needs of the participating water providers.

The SWSP II alignment will parallel the existing SWSP easement (further described in Section B) for the northern portion of the project, extending from Carter Lake through Larimer County to where the alignments diverge at St. Vrain Road near the Longmont Vance Brand Municipal Airport (Map 1). In 2006, Integra Engineering studied the initial feasibility of potential alternative routes for the second SWSP pipeline. The route evaluation considered 55 route alternatives and concluded that an alignment parallel to the existing pipeline, North of St. Vrain Road, is the best option. Benefits of a parallel alignment include limited new, permanent easement acquisition, limited environmental and land use impacts, limited constructability issues, and potentially lower project costs.

A more focused siting study was performed in 2010 by AECOM, which identified and evaluated four alternatives in greater detail through the City of Longmont. The four alternatives evaluated in the 2010 siting study included a route following the existing SWSP easement to the east; a route following 63rd Street to the west; a route along N. 75th Street; and a route along N. 73rd Street.

Another element of the project is the eastern turnout extending east from the main SWSP pipeline, from a point 0.5 mile west of the intersection of 87th Street and Vermillion Road. The 24-26 inch diameter pipeline will deliver water to the LPWD Treatment Plant on Vermillion Road and provide a future connection to the Town of Frederick in Weld County. The eastern turnout will utilize the existing SWSP pipeline easement that extends into Weld County.

Following a review by Larimer and Boulder counties, Northern Water will begin easement acquisitions and final design activities. The final design process will take into account property-specific factors that result from a detailed corridor survey and coordination with individual property owners. During the design process, specific utility locations will be identified to finalize the pipeline's location. Northern Water will continue to work with County departments and other service providers to avoid conflicts with existing and future utilities, including buried irrigation and tile drains.



Map Number & Title:	Project Title & Applicant	Consultant	Engineer	Preparation Date: 1/20/11
Map: 1 **Overall Selected Alignment**	Southern Water Supply Project II NCWCD 220 Water Ave. Berthoud, CO 80513 (970) 532-7700	AECOM 240 East Mountain Ave. Fort Collins, CO 80524 (970) 484-6073	Dewberry-Integra Engineering 1095 South Monaco Parkway Denver, Colorado 80224 (303) 825-1802	Revision Date 1: Revision Date 2: Revision Date 3:

Study Area (250 Ft Buffer)
Selected Pipeline Alignment
Existing SWSP Pipeline
0 0.5 1 Miles
N

Construction of the project will likely begin between 2014 and 2015. The typical pace for constructing the pipeline will most likely range between 200 to 400 feet per day, depending on the specific complexity of the alignment corridor. Tunneling and reduced easements would slow that rate of construction. Limited short-term road closures may be necessary and typically do not last more than a few days. A traffic control plan will be developed to provide an alternative traffic route.

All lands will be returned to pre-existing conditions that are consistent with a restoration plan prepared prior to construction, consistent with Boulder County requirements, and approved by each property owner. Full restoration of the surface, including fencing, drain tiles, irrigation systems, landscaping, private roads and other improvements will take additional time, but will be completed as soon as seasonal requirements allow. Irrigation grades will be restored and adjusted if settling occurs, post construction. Once the pipeline is buried and the ground surface is restored, the pipeline will be unnoticeable. Northern Water's easement agreements allow approved landscaping, crops, driveways, and parking lots to be placed over the pipeline. The placement of trees and permanent building and structures will not be allowed within the permanent easement. The previous SWSP provides a good demonstration of how little impact to the land and natural resources this project will have when proper construction zone restoration and revegetation techniques are employed (Photographs 1 through 3). In most areas, the SWSP construction disturbance is difficult to locate.

Photograph 1. Example of pre-construction conditions of the original SWSP, near Woodland Road.

Photograph 2. Example of construction of the original SWSP in 1995, near Woodland Road.

Photograph 3. Example of post-construction restoration of the original SWSP, near Woodland Road. No trees were removed during the original SWSP construction. Windrow of trees were removed in 2003 during the construction of a local irrigation ditch.

B. Project Background

In 1995, the original SWSP pipeline (Carter Lake to Broomfield Pipeline) was constructed from the St. Vrain Supply Canal diversion structure at Carter Lake south to its terminus at the City of Broomfield's then new water treatment plant and storage reservoir located northeast of the intersection of Sheridan Boulevard and 144th Avenue, a length of approximately 33.5 miles. The original project was collaboration between 12 project participants and Northern Water to convey Windy Gap and C-BT Project water from Carter Lake to each participant's delivery point. Since construction of the original pipeline, Northern Water has constructed two booster pumping stations along the existing pipeline to increase flow rates in order to meet additional water demands of the original project participants. The capacity of the original pipeline is now fully utilized.

In 1998, the eastern phase of SWSP was constructed from a point 0.5 mile west of the Intersection of North 87th Street and Vermillion Road, east to a treatment plant in Weld County located northeast of the City of Fort Lupton, a length of approximately 29 miles. The eastern phase was constructed to serve the City of Fort Lupton, Town of Hudson, City of Fort Morgan and Morgan County Quality Water District.

Due to interest from water provider participants (consisting of new participants) to improve water quality, provide a year-round water supply, and meet new demands, Northern Water has proposed to construct SWSP II.

C. Applicant and Consultants

Project Applicant

Northern Colorado Water Conservancy District (Northern Water), acting by and through the Southern Water Supply Project Water Activity Enterprise
220 Water Avenue
Berthoud, CO 80513
(970) 532-7700
Jim L. Struble, Real Estate Manager

Project Consultant

AECOM
240 East Mountain Avenue
Fort Collins, CO 80524
(970) 484-6073
John Ko, Project Manager

Strategic Planning Inc.
3665 Smuggler Place
Boulder, CO 80305
(303) 499-0619
Rosi Dennett, Project Manager

Engineering

Dewberry - Integra
1095 South Monaco Parkway
Denver, CO 80224
(303) 825-1802
Randy Parks, Project Manager

D. Purpose and Need for the Proposed Project

SWSP II is a collaborative project between five water providers (participants) and Northern Water to provide a mechanism to convey Windy Gap and C-BT Project water from Carter Lake to each of the individual participants. Each of the five project participants is located in the northern Colorado Front Range within Northern Water and Municipal Subdistrict boundaries.

There are two principal objectives that would be accomplished by the project. First, the existing open canal delivery systems serving the City of Boulder and Left Hand Water District (the primary project participants), as well as other participants, have had a number of water quality problems that have not been specifically identified or resolved. There have been a number of isolated spikes in fecal coliform bacterial contamination measurements in the Boulder Feeder Canal; however, a point source could not be located. Drinking water standards are becoming more stringent and the open canal delivery system is susceptible to tampering along the 23 miles of open canal starting at Carter Lake, with numerous publicly accessible road crossings. Transmission of water using a piped system would improve water quality and eliminate the potential risk of water quality degradation during delivery.

After September 11, 2001, the U.S. government recognized vulnerability in the country's drinking water supplies and developed the Bioterrorism Act (BTA) to help keep the nation's water supply safe. Prior to September 11, the Safe Drinking Water Act (SDWA) made sure that all tap water was free of contaminants and safe to drink. Title IV of the Bioterrorism Act of 2002 adds several provisions to the SDWA; these are known as the Drinking Water Security and Safety Amendments. One of these provisions states that any Community Water System (CWS) that serves more than 3,300 people must complete a one-time assessment of its vulnerability to attack by June 2004. These assessments are held by the EPA administrator to safeguard the information. The second provision requires the EPA administrator to focus on prevention, detection and response. An enclosed pipe would leave only one potential contamination source at the inlet at Carter Lake, which is managed by the U.S. Bureau of Reclamation (BOR). BOR has its own security plan to reduce the risk of intentional contamination threats. In addition, it would be more difficult to contaminate the intake at Carter Lake due to the large volume dilution factor.

Secondly, SWSP II would offer the ability to deliver year-round water supplies from Windy Gap and C-BT Project facilities. Presently, participants can only receive water deliveries between April 1 and October 31 through the St. Vrain Supply Canal and the Boulder Feeder Canal. The open canal systems are unable to deliver water during the winter months due to icing and associated consequences.

In addition, SWSP II would maintain the current water supply needs as well as accommodate a small increment of planned future water supply needs. SWSP II will tie into water treatment plants in the future and is intended for municipal use (residential and commercial) only. The St. Vrain Supply Canal and Boulder Feeder Canal would continue to serve agricultural needs. There are no plans to increase SWSP II capacity beyond 45 cfs due to engineered design limitations of the pipeline. Table 1 lists the needed pipeline capacity for each participant, with a summary of their purpose and need.

Table 1. Project participants and required demand

Participants	Capacity (cubic feet per second)	Purpose and Need
City of Boulder	25	Year-round delivery, improved security and water quality
Left Hand Water District	11	Year-round delivery, improved security and water quality
Longs Peak Water District	3	Year-round delivery, improved security and water quality
Town of Frederick	6	Year-round delivery, improved security and water quality, and increased supply
Total	**45**	

E. Activities Requiring 1041 Permits

This project requires Boulder County approval and meets the criteria in Section 8-401 of the Boulder County, Article 8, Location & Extent Areas & Activities of State Interest as shown below.

Section 8-401 Specific Water and Sewage Treatment Activities Requiring Permits

A permit shall be required for any new major domestic water or sewage treatment system, major extension to existing major domestic water or sewage treatment system, or municipal and industrial water project, which is proposed to be located in whole or in part in the unincorporated portions of Boulder County and which meets any of the following criteria:

Extensions to water supply and wastewater systems that:

1. Use 12-inch or larger distribution or transmission lines; or
2. Are not located entirely within an approved service area.

F. Permits Required after Designation; Receipt of Application Form

Section 8-501 requires that the entire development contemplated or reasonably foreseeable for at least a five-year period be submitted to ensure that the project is not considered piecemeal. SWSP II responds to the water demands previously documented in approved master plans and Intergovernmental Agreements (IGAs). The following master plans and IGAs are applicable to the five participants and their applicable service areas. All master plans and IGAs will be provided to Boulder County as part of this submittal, if requested.

City of Boulder
Boulder Valley Comprehensive Plan, 2005

Left Hand Water District
Left Hand Water District, 2006-2007 Treated Water Master Plan, 2007

Longs Peak Water District
City of Longmont IGA, 2003
Boulder County Service Plan Amendment, 2003

Town of Frederick
Frederick Boulder Creek Planning Area Comprehensive Development Plan
Intergovernmental Agreement, 2007

Other permits and reviews required to complete this project include a Section 404 permit of the Clean Water Act from the U.S. Army Corps of Engineers, City of Boulder Community and Environmental Assessment Process (CEAP), City of Boulder Open Space Advisory Committee (OSAC), City of Boulder Wetland Permit, and a Boulder County Utility Construction Permit. The City and County of Boulder approval processes will be performed during the easement acquisition.

G. Application Fee

The application fee for this project is not applicable since the City of Boulder and Left Hand Water District are political subdivisions located within Boulder County.

H. Pre-Application Conference

A pre-application meeting was held on April 15, 2008 and included representatives from Boulder County Land Use Department, Transportation, Health, and Open Space, as well as the applicant representatives from Northern Water, and Northern Water's permitting Consultant, EDAW, Inc., a company that now operates as AECOM. A follow-up meeting between the Boulder County Land Use Department staff planner and Rosi Dennett occurred on August 27, 2010 and served as the pre-application for this revised 1041 application.

I. Description of the Project Alternatives

One of the main objectives of the original feasibility study completed in January 2006 was to determine an optimum pipeline route to deliver the required flows to each participant's delivery point. This section documents the pipeline route alternatives evaluation process , which was initiated in 2006 (Dewberry-Integra) and further refined in 2010 (AECOM) The section begins with the development of preliminary proposed route alignment segments and continues through to selection of the proposed pipeline route.

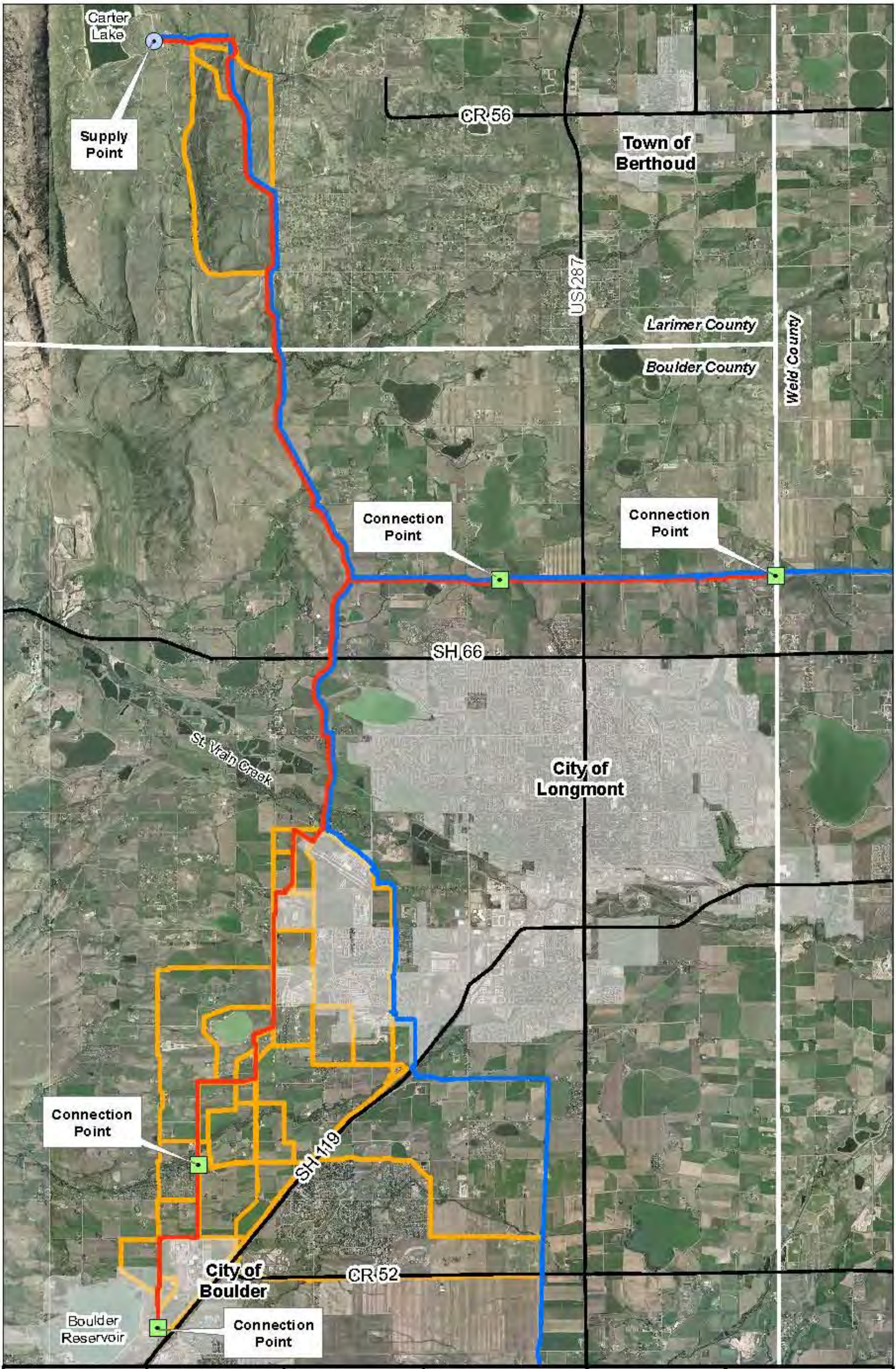
Development of Pipeline Route Alternatives

Alternatives were developed using each participant's specific delivery point, required hydraulic grade line at the delivery point, and the participant's required delivery flow rate. The selected alternative parallels the existing SWSP pipeline, which extends from the St. Vrain Supply Canal at Carter Lake south to its terminus at the City of Broomfield, for much of the route. Benefits of paralleling the existing alignment include limited new permanent easement acquisition, limited environmental and public impacts, limited constructability issues, and potential lower project costs. As a result, the existing SWSP pipeline route was considered as the primary route alternative for the majority of the new SWSP II pipeline, from Carter Lake to where it meets St. Vrain Road.

The initial network of pipeline route alternatives is shown in Map 2.

Beginning at St. Vrain Road on the north side of the Longmont Vance Brand Municipal Airport, more than 40 alternative route segments were generated to achieve water deliveries to the LHWD Dodd WTP and the City of Boulder's Boulder Reservoir WTP. Alternative routes were developed by examining existing corridors, such as roadways, railroads or railroad beds, canals, pipelines or existing utilities, and parcel boundaries. These alternatives were initially screened based upon qualitative criteria, including environmentally sensitive areas, future development, property boundaries, and existing rights-of-way (ROWs). The initial screening reduced the number of feasible route segments to approximately 35 individual segments.

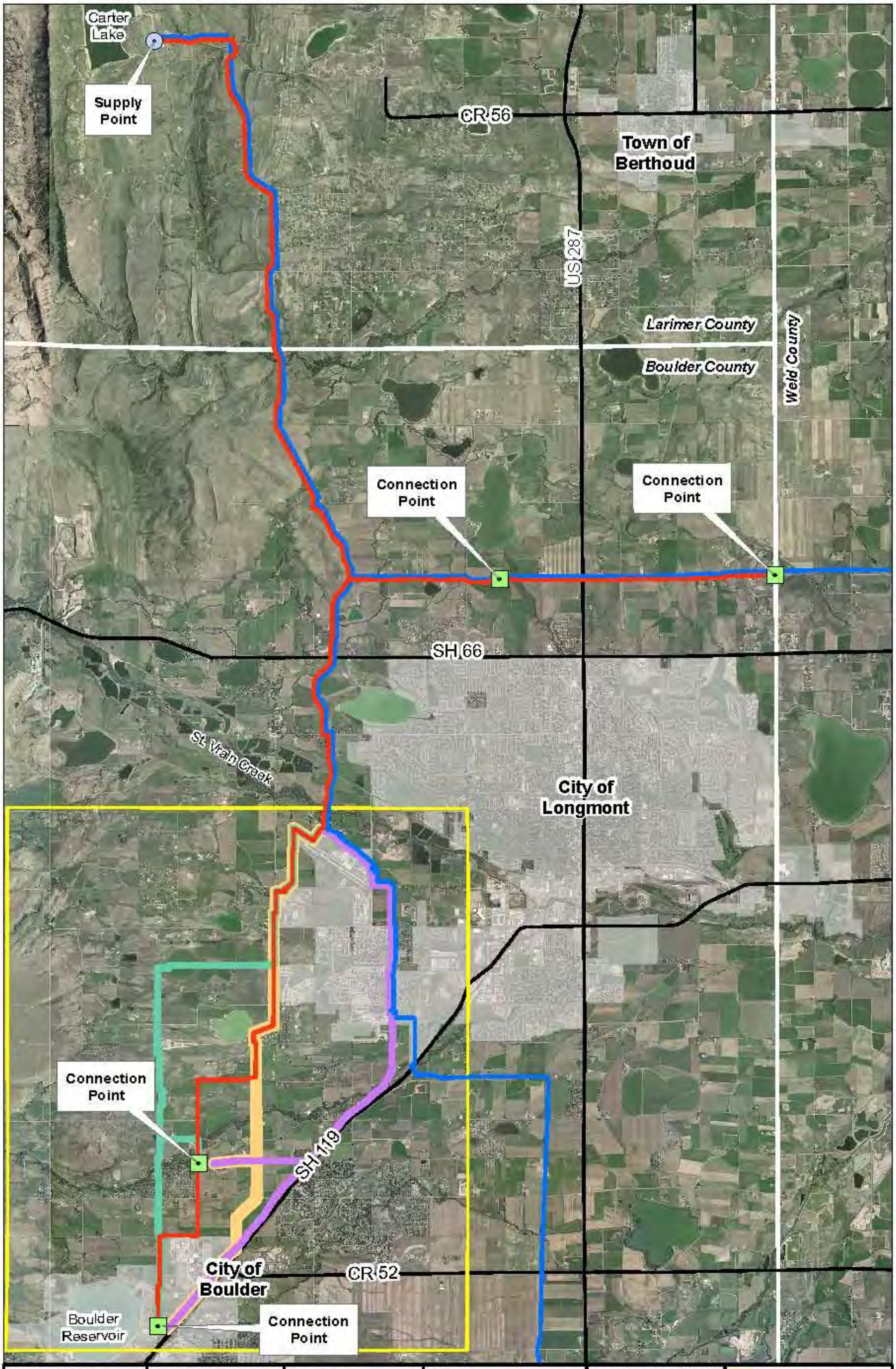
Following the 2006 alternatives evaluation, four alternative routes (Map 3) were selected to evaluate in greater detail in the area extending from St. Vrain Road to the delivery point near Boulder Reservoir. These alternatives included an eastern alternative along Airport Road and State Highway (SH) 119, a western route using N. 63rd Street, and two more direct routes using N. 73rd Street and N.75th Street.



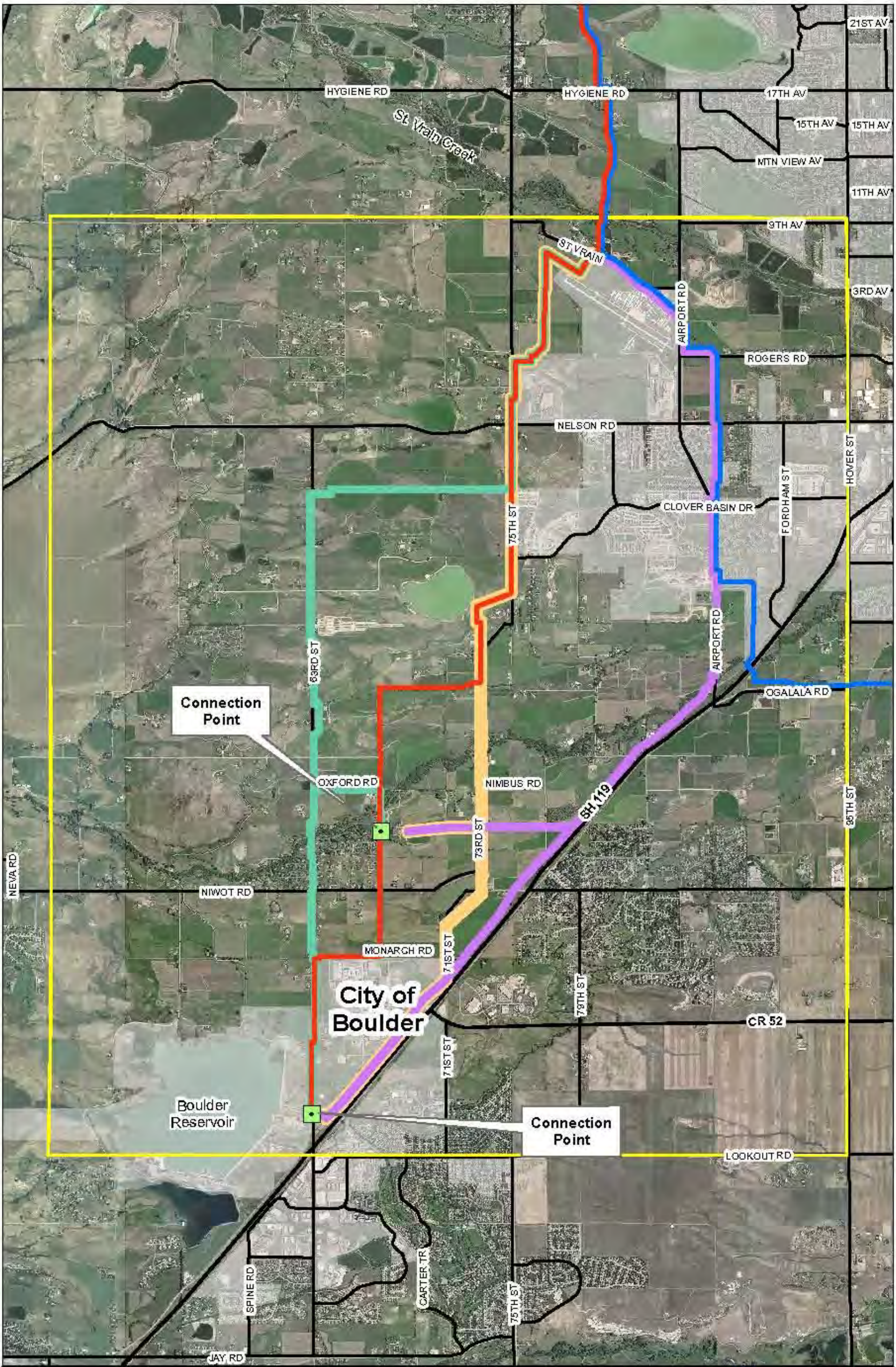
Map Number & Title:	Project Title & Applicant:	Consultant:	Engineer:	Preparation Date: 1/20/2011
Map: 2 **Overall Alternatives Considered**	Southern Water Supply Project II NCWCD 220 Water Ave. Berthoud, CO 80513 (970) 532-7700	AECOM 240 East Mountain Ave. Fort Collins, CO 80524 (970) 484-6073	Dewberry-Integra Engineering 1095 South Monaco Parkway Denver, Colorado 80224 (303) 825-1802	Revision Date 1: Revision Date 2: Revision Date 3:

Selected Pipeline Alignment
Alternative Alignments Evaluated
Existing SWSP Pipeline

0 0.5 1 Miles



Map Number & Title:	Project Title & Applicant:	Consultant:	Engineer:	Preparation Date: 1/20/2011
Map: 3 **Final Alternatives**	Southern Water Supply Project II NCWCD 220 Water Ave. Berthoud, CO 80513 (970) 532-7700	AECOM 240 East Mountain Ave. Fort Collins, CO 80524 (970) 484-6073	Dewberry-Integra Engineering 1095 South Monaco Parkway Denver, Colorado 80224 (303) 825-1802	Revision Date 1: Revision Date 2: Revision Date 3:



Map Number & Title:	Project Title & Applicant:	Consultant:	Engineer:	Preparation Date: 1/20/2011
Map: 4 **Final Alternatives**	Southern Water Supply Project II NCWCD 220 Water Ave. Berthoud, CO 80513 (970) 532-7700	AECOM 240 East Mountain Ave. Fort Collins, CO 80524 (970) 484-6073	Dewberry-Integra Engineering 1095 South Monaco Parkway Denver, Colorado 80224 (303) 825-1802	Revision Date 1: Revision Date 2: Revision Date 3:

Siting Report Study Area
Selected Alignment (Alt. 1)
Existing SWSP Pipeline
Alt. 2
Alt. 3
Alt. 4
0 0.5 1 Miles

Selection of Complete Pipeline Route Alternatives

A detailed quantitative analysis of the four alternatives can be reviewed in the Siting Report (AECOM 2010), which is attached as Appendix II. A summary of these results is provided below. Table 2 provides a tabulation of the occurrence of each of the evaluation criteria for each alternative, or a measurement using an appropriate metric, e.g., length, number of acres, etc.

Given the relatively similar length of each alternative (8.6-9.7 miles) and somewhat homogeneous nature of the project area, dramatic differences do not emerge in the ranking of alternatives. However, there are clear distinctions within certain evaluation categories. Based on a full analysis of these rankings and distinctions, Alternative 1 is the preferred alternative.

Alternative 1

This alternative has numerous advantages and few disadvantages, which include:

- Lower number of native trees removed, including lowest number of landscape trees
- Lowest number of parcels crossed
- Lower number of residences within 100 feet
- Lower level of disturbance to agricultural lands, including lands of national importance
- Lowest level of transportation effects
- A crossing of Left Hand Creek at a location that will minimize removal of cottonwoods and other riparian trees
- Lowest degree of conflict with existing utilities

Disadvantages of this alternative include:

- Greatest distance through open space.
- One of two alternatives with 3 raptor nests within 100 feet. This conflict will be mitigated by seasonal avoidance.

Alternative 2 (Western)

This alternative has relatively few advantages and several notable disadvantages. Advantages of this alternative include:

- Least disturbance to agricultural land of national importance

Disadvantages of this alternative include:

- Highest number of intermittent stream crossings
- Highest amount of wetland disturbance
- Two crossings of critical wildlife habitat
- Highest amount of crossing through riparian forest
- Highest amount of new easement required
- Highest overall level of disturbance to agricultural lands
- Highest level of transportation effects

Alternative 3 (Central)

This alternative falls in the mid-range for most criteria. Advantages of this alternative include:

- Lower distance through open space areas, including both areas with conservation easements and areas owned fee simple by local governments
- Least number of residences within 100 feet of the alignment
- Lowest amount of riparian vegetation disturbed

Disadvantages of this alternative include:

- Highest number of native riparian trees removed
- Some isolated construction difficulties, such as along 73rd Street at Left Hand Creek and adjacent residences
- Although mid-range in total agricultural land crossed, County staff report that these lands are some of the highest value lands in the project area

Alternative 4 (Eastern)

This alternative has several advantages as well as distinct disadvantages. Advantages of this alternative include:

- Lowest amount of wetland
- Lower amount of riparian vegetation disturbed
- Lowest amount of agricultural land disturbed

Disadvantages of this alternative include:

- Highest number of landscape trees removed
- Highest level of land use conflicts including number of residences within 100 feet, total number of parcels crossed, and number of commercial uses within 100 feet that would be disrupted by construction activities
- Highest level of transportation effects due to over 4 miles of construction adjacent to SH 119 and the highest number of crossings of major arterials and paved county roads
- Highest degree of conflict with existing utilities

Table 2. Route Evaluation Criteria

Category	Alternative 1 (Original Proposal)	Alternative 2 (Western Route)	Alternative 3 (Central Route)	Alternative 4 (Eastern/Hwy Route)
Impact Ranking				
Water Features				
Perennial Streams				
number of crossings	3	3	3	3
Intermittent Streams				
number of crossings	2	7	2	1
Vegetation				
Wetlands				
area (acres)	1.9	3.5	1.7	1.1
Significant Natural Communities (Great Plains Salt Meadow)	-	-	-	-
Trees Removed				
Native Trees (cottonwood and coyote willow and peachleaf willow)	17	21	43	23
Landscape Trees	40	81	80	286
Exotic (Russian olive, Siberian elm, etc.)	70	93	11	23
Wildlife				
Critical Wildlife Habitat (Boulder Co)				
(number of crossings)	1	2	1	-
State and Federal T & E Habitat (PCAs)				
area (acres)	-	-	-	-
Riparian Forest				
(acres)	0.7	1.3	0.5	0.3
Raptor Nests				
Number of Nests within 100 ft.	3	3	2	-
Open Space				
Open Space				
length (miles)	2.8	2.4	2.0	2.2
Conservation Easements				
length (miles)	1.2	0.4	0.7	1.3
Total Distance (miles)	4.0	2.8	2.7	3.5
Land Use				
Number of Parcels Crossed	32	44	36	60
Number of Residences within 100 ft.	13	27	9	82
Number of Commercial Buildings within 100 ft.	6	8	4	18
Total Area of new easement (ac)	75.0	79.0	69.0	43.5

Category	Alternative 1 (Original Proposal)	Alternative 2 (Western Route)	Alternative 3 (Central Route)	Alternative 4 (Eastern/Hwy Route)
Agriculture				
Significant Agricultural Lands In Cultivation (unless noted, all ag lands crossed are flood irrigated)				
National (acres)	**14.4**	**7.4**	**17.4**	**19.3**
State (acres)	**15.3**	**36.4**	**12.0**	**9.4**
Local (acres)	**-**	**-**	**0.5**	**-**
Overall (acres)	**29.7**	**43.8**	**29.9**	**28.7**
Transportation				
State Highway				
number of crossings	**-**	**-**	**-**	**-**
length of parallel (miles)	**-**	**-**	**1.4**	**4.2**
Major Arterials				
number of crossings	**7**	**8**	**8**	**10**
length of parallel (miles)	**4.4**	**6.2**	**3.1**	**1.6**
County Road (paved)				
number of crossings	**1**	**4**	**2**	**7**
length of parallel (miles)	**-**	**-**	**0.4**	**0.7**
County Road (unpaved)				
number of crossings	**3.0**	**5.0**	**2.0**	**4**
Utilities				
Conflict Rating (see Sec. 4)				
Constructibility	**Easy**	**Isolated Difficulties**	**Isolated Difficulties**	**Difficult**

Based on a thorough analysis of the alternatives, Alternative 1 is the least damaging. Alternative 1 has the lowest disturbance to trees, lowest level of transportation effects, and the least amount of conflict with existing utilities. It is also close to having the lowest amount of disturbance to agricultural lands. In addition, Alternative 1 has the lowest number of parcels crossed and close to the lowest number of residences within 100 feet. For other considerations such as stream crossings, wetlands, crossings of critical habitat, and riparian vegetation, Alternative 1 falls in the mid-range among the alternatives considered. Although other alternatives have an advantage on some individual evaluation criteria, none are consistently better or result in less environmental damage.

The environmental impacts associated with Alternative 1 can be mitigated to minimize both the short- and long-term effects. Impacts to riparian forest through Left Hand Creek are minimized by the Alternative 1 alignment, which routes the construction between the large trees, thereby avoiding impacts that are reflected in an overall acreage calculation. Timing of construction across the larger perennial and intermittent drainages will occur in winter to minimize impacts to active wildlife. Nearby raptor nests will be avoided during the nesting season. Open space and conservation land designations, as well as agricultural land uses, will be mitigated by fully revegetating the easement to pre-construction conditions. Construction on agricultural and irrigated lands will occur when soil conditions are dry (to the extent possible) to minimize the collapse of soil structure and increased compaction. Soil amendments and decompaction (through deep ripping) or subsoil will be used if compaction occurs. Flood irrigated fields will be restored and grade adjustments will be made if settling occurs. Any tile drains encountered will be repaired.

No alternatives were considered for the eastern segment of the project along Vermillion Road. This segment is located adjacent to the existing eastern phase of the SWSP pipeline and primarily utilizes existing SWSP permanent easements. It is anticipated that Northern Water will need to acquire an additional 20 feet of permanent easement for the SWSP II pipeline.

Selected Pipeline Route Description

The selected SWSP II pipeline begins at the existing diversion structure at the St. Vrain Supply Canal near Carter Lake and runs generally south to the Boulder County line, following the alignment of the existing SWSP pipeline. From the St. Vrain Supply Canal to the eastern turnout located west of the intersection of North 87th Street and Vermillion Road, the existing permanent easement is 90 feet in width.

After crossing the Little Thompson River at the Larimer-Boulder County line, the selected route continues nearly due south for just under 1 mile, where it intersects an existing overhead power transmission utility. From this point, the pipeline turns southeast, paralleling the overhead power line for approximately 1 mile until the pipeline intersects Woodland Road. After Woodland Road, the pipeline continues southeasterly a little over 1 mile to the existing eastern turnout, generally following the overhead power line, though not exactly parallel.

At this point, the pipeline turns southwesterly for approximately 2,000 feet until again turning south and continuing to SH 66, crossing the Highland Ditch, the Rough & Ready Ditch, and the Supply Ditch along the route. After crossing SH 66, the pipeline continues south around the west side of McIntosh Lake on Boulder County Open Space property, and then continues south a little over 1 mile to the intersection of Hygiene Road. After crossing Hygiene Road, the pipeline turns east for approximately 400 feet and then resumes a southerly alignment, crossing the Burlington Northern Santa Fe railroad and the St. Vrain River until reaching St. Vrain Road. From Hygiene Road south to St. Vrain Road, the City of Longmont's 36-inch diameter Clover Basin Pipeline is also proposed to parallel the existing SWSP pipeline within the existing permanent easement. From the eastern turnout located 0.5 mile west of the

intersection of North 87th Street and Vermillion Road to St. Vrain Road, the existing permanent easement is 80 feet in width. This length of pipeline traverses generally open agricultural property along with a few residential acreages.

The SWSP II route diverges from the original SWSP pipeline alignment on the south side of St. Vrain Road, skirting the Longmont Vance Brand Municipal Airport and heading west across the Clover Basin Ditch and then south paralleling the Clover Basin Ditch. The pipeline continues southwest and crosses the Downing and Davis Ditch through a gap in the trees, and heads west towards N. 75th Street. Before reaching N. 75th Street, the pipeline turns south and crosses to the west side of N. 75th Street south of Peck Ditch, and continues south. The pipeline route crosses Nelson Road and continues south across North Dry Creek, James Ditch, and Pike Road to a point just east of Lagerman Reservoir. At this location, the route continues southwest along the north side of Dry Creek for approximately 1,300 feet before crossing over Dry Creek and turning south. From this location, the alignment continues south across a wet meadow, crosses N. 73rd Street, and continues along the east side of N. 73rd Street for approximately 1,300 feet to the Holland Ditch. Here, the alignment turns west, crosses N. 73rd Street a second time, and continues west along the north side of the Holland Ditch for approximately 4,000 feet. The alignment would then turn due south for approximately 6,000 feet, crossing Nimbus Road and Left Hand Creek to the LHWD Dodd WTP. From the LHWD Dodd WTP, the alignment would continue due south approximately 4,500 feet to the north side of Monarch Road, crossing Niwot Road along the way. At Monarch Road, the alignment turns west along the north side of Monarch Road to N. 63rd Street. At N. 63rd Street, the alignment turns south to Boulder Reservoir WTP just north of SH 119.

The eastern segment of the project begins approximately 0.5 mile west of the intersection of N. 87th Street and Vermillion Road. This segment of the pipeline typically has an existing 50-foot-wide permanent easement and typically traverses open pasture lands with few improvements in this length. The eastern segment parallels Vermillion Road and jogs around (to the south) two separate residences near 95th Street. The pipeline crosses to the north side of Vermillion Road, approximately 1,000 feet west Vermillion Trail, and continues east to the Weld County line.

As a result of the analysis of the 2010 Siting Report (AECOM), the preferred route was refined at several locations. The purpose of these refinements was to reduce the environmental impacts associated with the route. The route refinements are provided below.

- West of the airport, the preferred route follows the Clover Basin Ditch south instead of N. 75th Street to avoid significant agricultural lands and a windrow of mature trees.
- South of Lagerman Reservoir, the preferred route jogs west to avoid impacts to the existing prairie dog colony fence and an adjacent wetland.
- North of Monarch Road, the preferred route heads due south instead of following the parcel boundary to avoid large mature cottonwoods.

Easement Requirements

Permanent Easement

The portions of the proposed SWSP II pipeline alignment alternatives, which parallel the existing SWSP Broomfield pipeline and will serve the City of Boulder and Lefthand Water District, are anticipated to be constructed within the existing permanent easement, requiring no new permanent easement acquisition. The existing permanent easement ranges between 80-90 feet in width and should provide adequate space to construct a parallel pipeline. The portions of the alignment that diverge from the existing SWSP pipeline alignment will require the acquisition of new permanent easement, typically 70-90 feet in width, depending when co-location with other existing ROW.

The eastern phase of SWSP II, which will serve LPWD and the Town of Frederick, will parallel the existing eastern phase of SWSP. SWSP II will utilize a portion of the existing 50-foot-wide permanent easement; however, an additional 20 feet of permanent easement will be required to safely construct, operate, and maintain the eastern section of SWSP II.

Temporary Construction Easement

The original SWSP pipeline project typically utilized an additional 20 feet of temporary construction easement. It is anticipated that 20 feet of temporary construction easement will also be obtained for the proposed SWSP II pipeline. The 20 feet of temporary construction easement will have to be acquired for the entire length of the proposed alignment, even in those portions where the proposed pipeline will parallel the existing SWSP pipeline.

The eastern phase of the SWSP project utilized an additional 40 feet of temporary construction easement. Since an additional 20 feet of permanent easement will be acquired, Northern Water will need to acquire an additional 20 feet of temporary construction easement for the entire length of the proposed eastern alignment.

Prior to construction, the limits of construction easement will be delineated to ensure material and activities remain with the easement.

Typical Pipeline Construction Corridors

As noted previously, for those locations of SWSP II to be constructed within the existing SWSP pipeline easement, the typical existing permanent easement width is 80-90 feet with 20 additional feet of temporary construction easement to be obtained for SWSP II. For those locations where the SWSP II pipeline diverges from the existing SWSP easement, the permanent easement width will typically be 70-90 feet in width, depending upon co-location with other existing ROW.

For the eastern phase of SWSP II, which will be constructed parallel to the eastern phase of the existing SWSP, Northern Water presently owns a 50-foot-wide permanent easement. Therefore, 20 additional feet of permanent easement and an additional 20 feet of temporary construction easement will be obtained for the eastern phase of SWSP II.

To achieve an efficient pipeline construction project, adequate space for the following construction components needs to be provided:

- Safe excavation of the pipeline trench (dependent upon soil types and conditions)
- Stockpiling and maintenance of topsoil (strippings)
- Stockpiling of excavated material (spoil)
- Delivery and stockpiling of pipe bedding material
- Delivery and layout (stringing) of pipe
- Delivery of pipeline appurtenances, concrete, other construction materials
- Execution of dewatering activities, welding, appurtenance construction
- Movement of construction equipment alongside excavation, backfill operations

Construction widths ranging from 90 to 110 feet total, available for construction of pipelines ranging from 28 to 60 inches in diameter, provide adequate space for the contractor to efficiently perform the above listed tasks and maintain a good production rate, resulting in faster construction and lower pipeline installation costs.

It should be noted that some variations will occur in the typical cross-section shown due to variations in width of the existing SWSP easement. Where the proposed SWSP II pipeline would be parallel to the existing SWSP pipeline, it will be located within the existing 50 to 90-foot-wide permanent easement. Figure 1 shows a typical construction corridor cross-section

where the proposed SWSP II pipeline is parallel to the existing SWSP pipeline and within the existing 90-foot easement. Figure 2 shows a typical construction corridor cross-section where the proposed SWSP II pipeline is parallel to the existing SWSP Pipeline and within the existing 80-foot easement. Figure 3 shows a typical cross-section of the eastern phase of the SWSP II pipeline, which will utilize a 70-foot permanent easement (Northern Water presently owns a 50-foot permanent easement and an additional 20-feet will need to be acquired) and an additional 20-foot temporary construction easement. The various construction corridor cross-sections for the locations shere SWSP II diverges from the existing SWSP easement are shown in the September 2010 Siting Study included in appendix II. With a gross estimation of 110-foot-wide (maximum) construction impact (permanent and temporary construction easements), a maximum of 352 acres would need to be restored to existing conditions.

As the project design is further refined, construction widths will be narrowed for short distances to reduce impacts to environmentally sensitive areas (including some of the stream or creek crossings), existing residences or surface improvements, or other constraints. At these locations, the zone of disturbance can be reduced to a width of approximately 50 feet. Creek crossings will be performed via open trench during low flow periods in the winter months. In addition to offering low flows, winter construction assures that the riparian corridors will be largely dormant and many species will be either hibernating (such as some mammals and amphibians), or will have migrated south (such as some birds). Most aquatic species, such as fish, will have moved to deeper pools. Construction is expected to be completed at stream crossings within 7-14 days, even with a confined work area in environmentally sensitive areas.

Stream crossings using boring versus open trench construction methods is a topic that frequently comes up on pipeline projects. The primary advantage of boring is a reduction in the amount of surface area disturbed within the stream channel. When compared to open trench construction, this advantage is partially offset by a longer construction period, i.e., an extended period during which construction activity occurs in or adjacent to riparian corridors, higher costs, and more complex construction. Boring requires excavation of an entry and exit pit at each end of the bore, dewatering, and increased risk of collapse with an associated safety hazard. Given the temporary nature of the disturbance, the ability to restore the site quickly and the benefits of a reduced construction period, Northern Water has proposed to use open trench construction techniques. Photograph 4, which shows the crossing of the St. Vrain River by the first SWSP project, illustrates how completely a stream crossing can be restored using open trench construction. Prior to entering major waterways, construction equipment will be treated and cleaned in accordance with CDOW guidelines to avoid the spread of invasive aquatic species.

Photograph 4. View of SWSP I at crossing of St. Vrain River.

Figure 4 shows a typical construction corridor cross-section narrowed to 50 feet in width. Narrowing the construction corridor to 50 feet is a significant constraint for pipeline installation and cannot be effectively maintained for long distances.

Environmental Commitments

Similar to the original SWSP, this project will be designed and constructed in a manner that minimizes both short-term and long-term effects on land use and environmental resources. A complete list of SWSP II environmental mitigating committments is provided in the Appendices. Maps showing Land Use and Environmental Resources are provided in Appendices II and IV; a table listing water, wetland, and sensitive habitat crossings are provided in Appendix V. As described in more detail in Appendix I, a comprehensive set of environmental mitigation measures were developed to minimize project impacts on land use, natural and cultural resources. A summary of these environmental commitments is provided in the remainder of this section.

1. **Special Construction Measures:** Special construction measures will be utilized in sensitive areas such as wetlands to minimize the width of the zone of the disturbance associated with construction activities.

2. **Seasonal Restrictions:** Construction will not take place near raptor nests and other sensitive habitats during the most sensitive seasons. Also, construction will occur at major drainage crossings during periods of low flow.

3. **Sedimentation Control:** In areas of high water table, the water that accumulates in the trench will be diverted to specially constructed settling basins prior to discharge into the nearest natural water body or drainage channel.

4. **Reclamation/Revegetation of Disturbed Areas:** Plant cover of a density equal to or greater than that of the original cover will be achieved in disturbed areas within two growing seasons. This will be done in consultation with appropriate governmental agencies and interested private landowners.
    a. ***Landscaped Areas:*** NCWCD will pay just compensation for or, at the landowner's option, replace landscape plantings (trees, shrubs, ground covers, lawns), and built features (terraces, paved areas, parking lots, fences, gates, minor structures, etc.) removed or damaged by pipeline construction.
    b. **Cultivated Land:** NCWCD will pay compensation for crops destroyed, damaged, or foregone because of construction. The land and facilities will be restored as nearly as practicable to original condition.

5. **Right-of-Way:** Landowners will be paid just compensation for the rights acquired.

6. **Additional Specialized Mitigation Measures:** Special mitigation measures will be used as needed in sensitive locations:
    a. Perform geologic investigations to identify potential landslides/subsidence area.
    b. Stabilize areas of potential mass movement.
    c. Resurvey for sensitive species if determined necessary by USFWS and CDOW.
    d. Relocate any rare plant populations identified.
    e. Perform burrowing owl surveys to ensure owls are not present at prairie dog towns if construction will be performed between March 1 and November 1.

7. **Cultural:** Prior to easement acquisition and final engineering, NCWCD will hire a professional archaeologist to survey and identify cultural resources that could be affected by the project. The project will be designed in so far as technically, economically, and evnironmentally feasible to avoid the placement of development and construction activities in a manner that may affect historical or archeological resource areas of statewide importance.

8. **Specific Siting of Project Elements:** The 1041 Submittal and Feasibility Study were based on available published, mapped information, and supplemented by field checking. Prior to construction of the selected route, specific site conditions at environmentally sensitive areas will be examined to identify opportunities for reducing impacts by minor route adjustments within the defined corridor.

9. **Wildlife:** Prior to any construction that may occur during the breeding seasons, segments will be surveyed for any nesting birds that may be covered under the Migratory Bird Treaty Act. All active nests will be avoided and CDOW and USFWS will be consulted to minimize impacts to adjacent nesting activity.

10. **Environmental Monitor:** Northern Water will fund an environmental monitor to monitor the construction of the project to ensure that all of the environmental commitments are being met.

Figure 1. Existing 90-foot permanent easement and 20-foot temporary construction easement

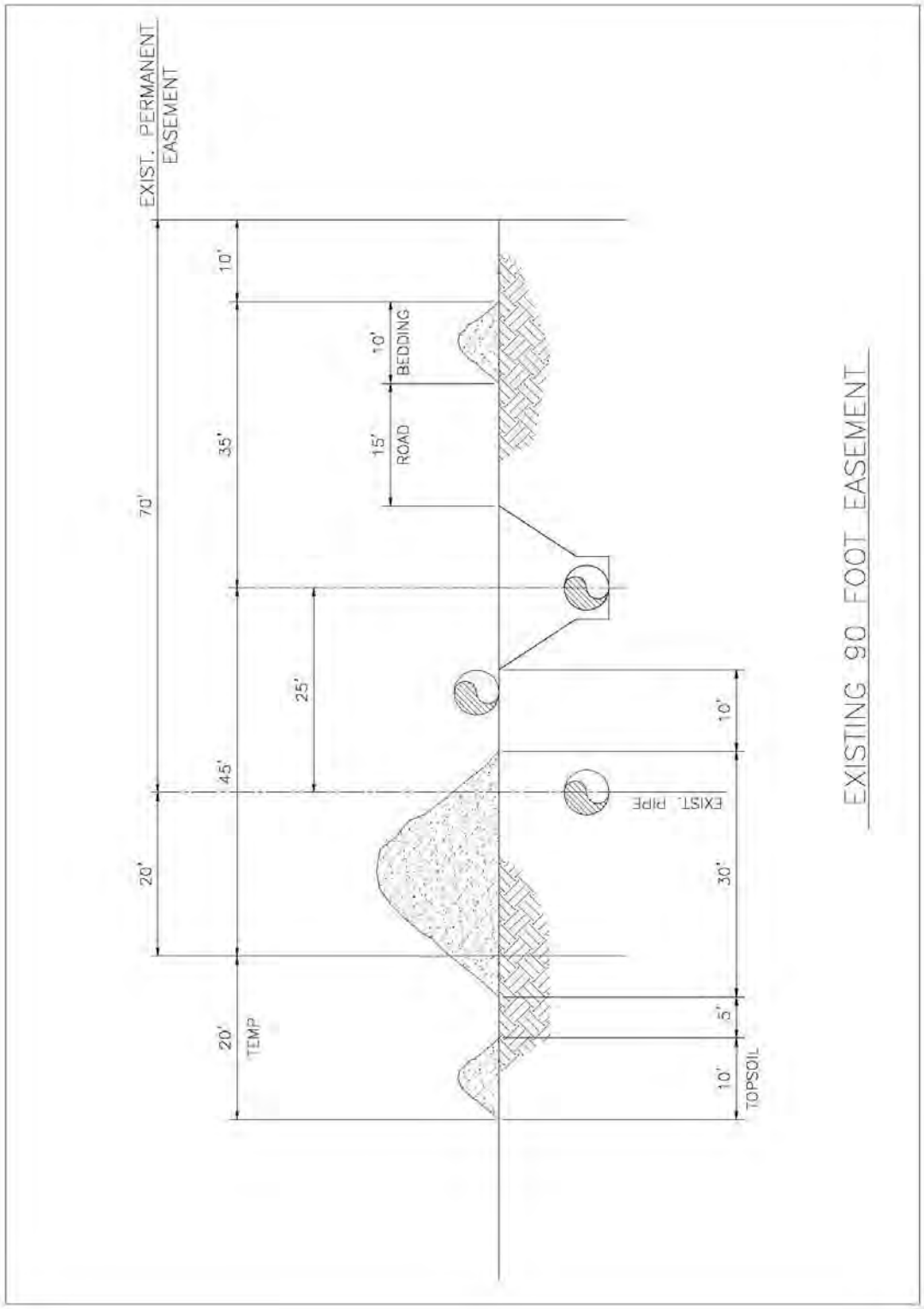


Figure 2. Existing 80-foot permanent easement and 20-foot temporary construction easement

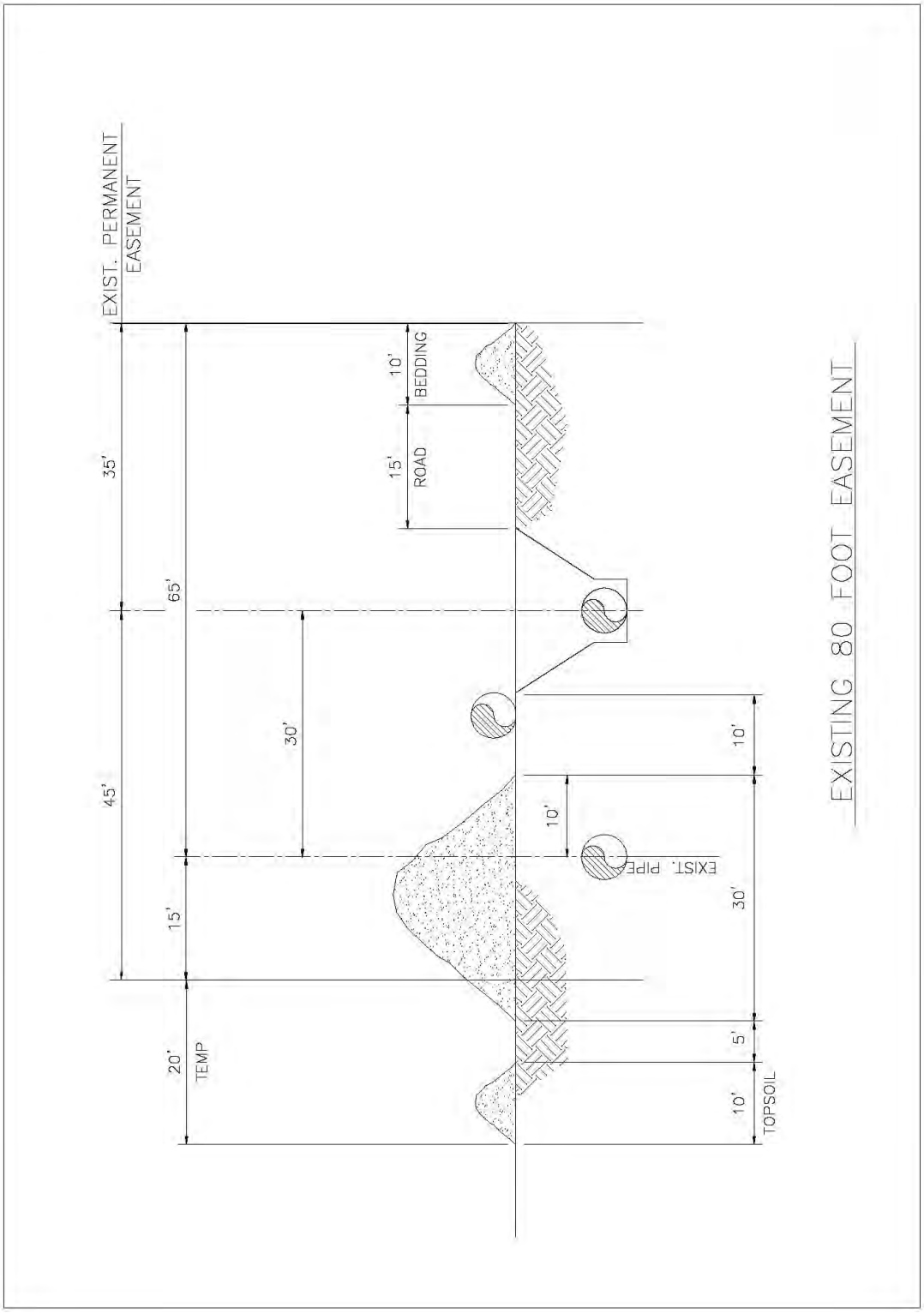


Figure 3. Eastern phase 70-foot permanent easement and 20-foot temporary construction easement

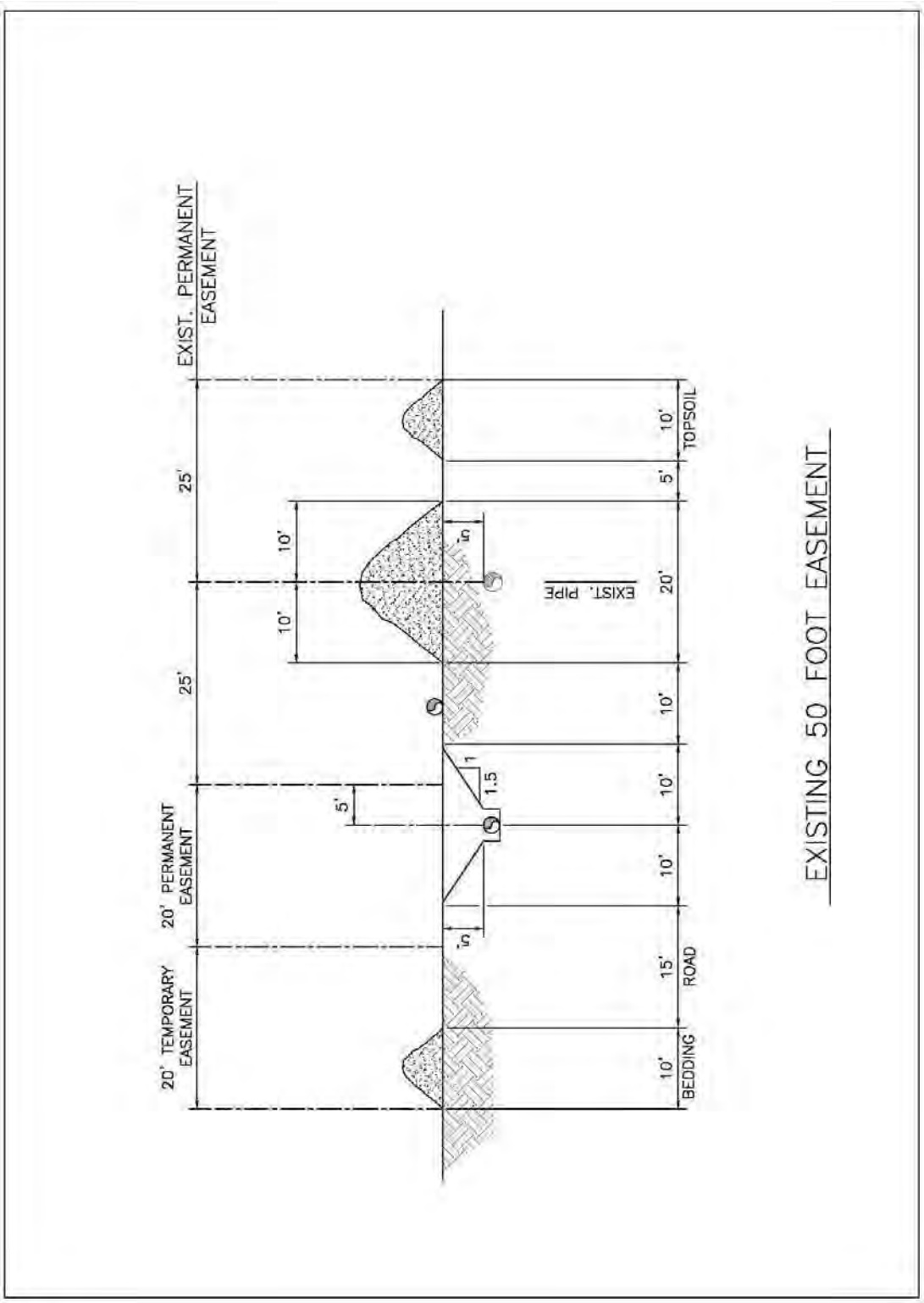
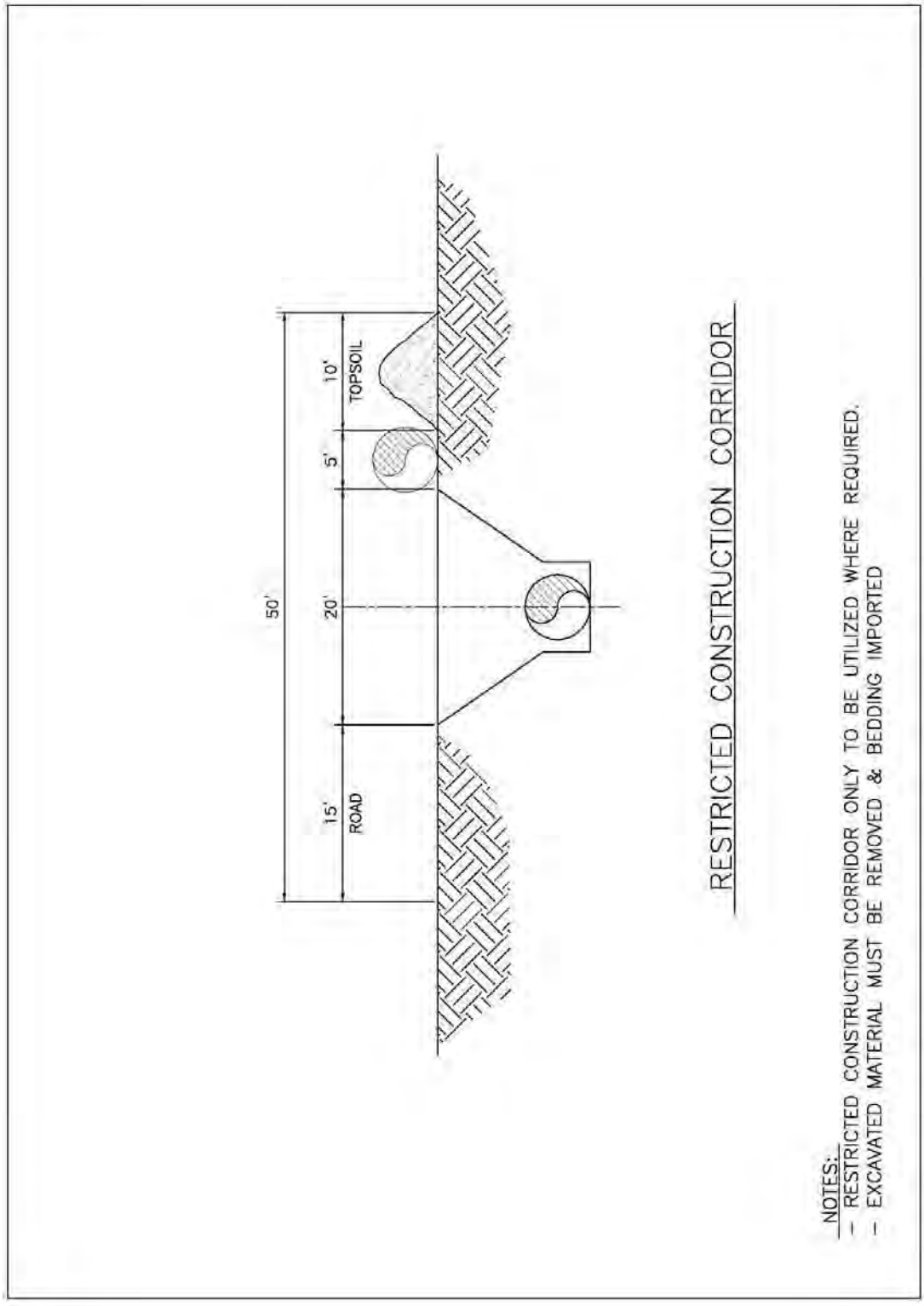


Figure 4. Restricted 50-foot construction corridor



J. Service Area and System Capacity

The existing source water system being replaced is the St. Vrain Supply Canal and the Boulder Feeder Canal, which does not provide year-round flow or secure water quality conveyance due to the open canal delivery system. SWSP II will replace a portion of the City of Boulder and LHWD's open canal diversions with an enclosed pipeline. The St. Vrain Supply Canal and the Boulder Feeder Canal will continue to exist and provide deliveries to both agricultural and municipal users.

SWSP II is primarily intended to serve existing demands. The capacity designed into the project is 45 cfs, including 25 cfs for the City of Boulder, 11 cfs for LHWD, 3 cfs for LPWD, and 6 cfs for Town of Frederick; no excess capacity has been included in the design.

The service area for each of the five participants is discussed below and is shown on Map 5. Table 3 summarizes capacity and growth for each participant, and Table 4 describes how this project ties into each of the participant's master plans.

Table 3. Summary of participants use and expected growth

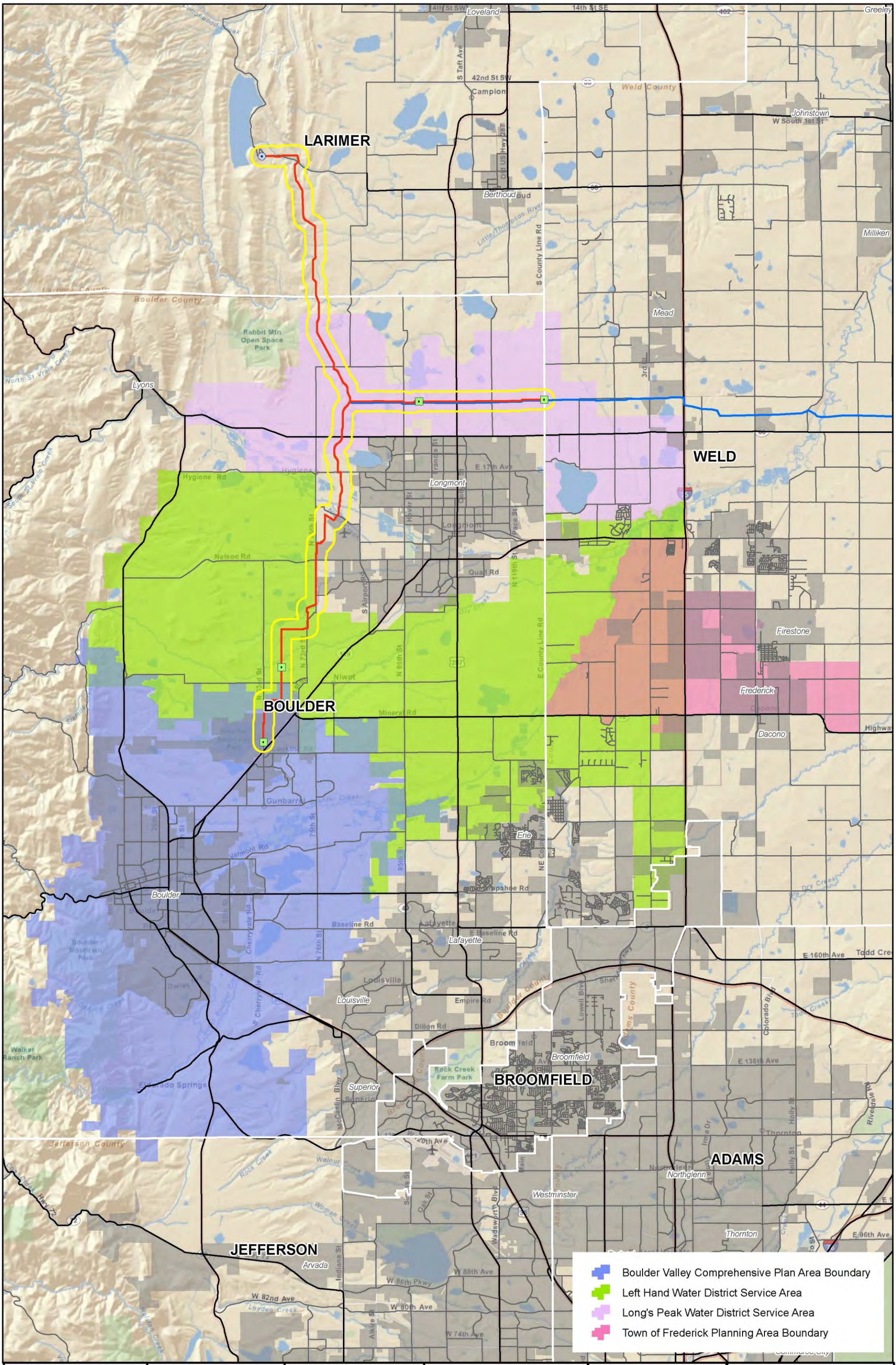
Participants	2008 Use Type	2008 Current Use (AF)	2008 System Capacity (cfs)	SWSP II Capacity (cfs)	Projected System Capacity with SWSP II (cfs)	Projected 2020 Use Following SWSP II (AF)	Population	Water from NCWCD	Projected 2020 Population (extrapolated estimates)
City of Boulder	Residential (62%), commercial/industrial/institutional (26%), municipal (3%), unaccounted (9%)	20,311	95	25	95	Expected to be similar to 2008 use	112,000	21,015 units C-BT; 37 units Windy Gap	118,000
Left Hand Water District	Residential (6,020 accounts), commercial (299 accounts)	4,639.9	24	11	24	7,344	18,781	6,753 (CBT)	25,157
Longs Peak Water District	Residential, some commercial	1,018	4.35	3	5.65	Not Available, but not expected to change as a result of SWSP II	2,800	1,726.8 units C-BT; 2 shares Highland Ditch Co.; 4 shares Supply Ditch Co.; 2/3 share Rough & Ready Ditch Co.; 1/2 share Pleasant Valley Reservoir; 6 shares Oligarchy Ditch Co.	3,640
Town of Frederick	Residential	N/A	N/A	6	N/A	N/A	7,997	N/A	46,000

N/A – Not applicable

Table 4. Summary of how SWSP II will achieve participant's master plan goals

Participant	Document Title	How SWSP II will tie into plan
City of Boulder	Boulder Valley Comprehensive Plan (BVCP) Source Water Management Plan 2009-2014 Capital Improvement Program Integrated Evaluation of Boulder Reservoir Water Treatment Plant (BRWTP) Source Water Protection and Treatment Improvements Study Public Health Security and Bioterrorism Preparedness and Response Act of 2002 (Public Law 107-188)	Year-round delivery, improve security and water quality.
Left Hand Water District	Boulder County Resolution 96-83 [LHWD's] Strategic Plan and Capital Improvement Program Public Health Security and Bioterrorism Preparedness and Response Act of 2002 (Public Law 107-188) New approved 1041 Permit for Dodd WTP, BOCO Resolution 2009-126[1]	Year-round delivery, improve security and water quality.
	additional city land use and master plans	
Longs Peak Water District	No Master Plan available	LPWD plans to be involved in SWSP II to use either LPWD supply from LTWD, treat water using LPWD, or a combination of both to ensure tap holders the best and most economical water supply possible. Further, it provides a secondary source that will ensure uninterrupted service should the other source fail - either long-term or short-term.
Town of Frederick	Town of Frederick Comprehensive Plan [Town of Frederick and Boulder County] Inter-governmental Agreement	SWSP II water will help the Town of Frederick support its expected growth.

[1] BOCO Resolution 2009-126 includes permit for “construction of a supplemental raw water pipeline from the proposed Northern Colorado Water Conservancy District’s Southern Water Supply Project II line..”



Map Number & Title:	Project Title & Applicant	Consultant	Engineer	Preparation Date: 1/20/2011
Map: 5 Water District Service Area Boundaries and Planning Areas	Southern Water Supply Project II NCWCD 220 Water Ave. Berthoud, CO 80513 (970) 532-7700	AECOM 240 East Mountain Ave. Fort Collins, CO 80524 (970) 484-6073	Dewberry-Integra Engineering 1095 South Monaco Parkway Denver, Colorado 80224 (303) 825-1802	Revision Date 1: Revision Date 2: Revision Date 3:

Selected Pipeline Alignment
Study Area (3000 ft wide)
Existing SWSP Pipeline
0 1 2 Miles

City of Boulder

The Boulder Valley Comprehensive Plan (BVCP) defines the limits for urban development in the Boulder Valley. Map 6 shows the established framework for annexation and service provision as described below:

- Area I is the area within the city.
- Area II is the area planned for annexation and service provision within the 15-year planning period.
- Areas I and II form the city's service area.
- Area III - Rural Preservation Area includes lands designated to remain rural in character.
- Area III - Planning Reserve is an area where the city and county intend to maintain the option of expanded urban development beyond the planning period.

The City of Boulder provides water for these areas consistent with the BVCP. Future needs are evaluated in accordance with service criteria and standards set forth in the BVCP, and comprise approximately 58 square miles.

The City of Boulder supplies water to Area I, and will supply water to Area II within the planning period pursuant to the city's annexation policies and capital improvements program.

The St. Vrain Supply Canal and the Boulder Feeder Canal provide enough capacity to the City of Boulder for planned build-out in 2035. SWSP II is not intended to increase capacity for the city, but instead is designed to address safety and reliability needs. The additional requirements of the Public Health Security and Bioterrorism Preparedness and Response Act of 2002 (Public Law 107-188) and the need for a year-round water supply are satisfied with SWSP II. There are no other municipal providers within the Boulder service area. The City of Boulder's total water treatment capacity is 61 million gallons/day, or 95 cfs (45 MGD from Betasso WTP and 16 MGD from the Boulder Reservoir WTP), and there are no additional plans to expand this capacity.

The City of Boulder currently owns 21,015 units of the 310,000 units in the C-BT Project. In addition, the City of Boulder owns 37 units of the Windy Gap Project. SWSP II will deliver only a portion of this water. The remainder of the water will continue to be transported via the St. Vrain Supply Canal and the Boulder Feeder Canal. Boulder plans to deliver all water intended for potable use via pipeline. The Boulder Reservoir WTP capacity is 16 MGD, so up to 16 MGD (about 49 acre feet/day) that is now carried in the canal would not be delivered by the canal with the pipeline in operation. While it's not possible to make a statement like "X% of the city's total CB-T and Windy Gap water will be transported via the pipeline" because flows will vary based upon demand, the city reviewed historical canal flows and deliveries to the WTP. Estimated changes in canal flows are described below (from a 6/15/09 informational update to the city's Water Resources Advisory Board):

Boulder Feeder Canal/Boulder Reservoir Water Quantity and Quality

> Questions have been raised concerning reduction in water quantity and associated potential degradation in water quality in the Boulder Feeder Canal if the pipeline were to be constructed. In terms of water quantity, future canal flows would not include up to 25 cfs of water that the canal would otherwise convey for treatment to meet municipal demand in the City of Boulder. The pipeline would not carry water that the city uses for exchange purposes, irrigation or city-owned Boulder Reservoir storage. Such flows would continue to be conveyed through the feeder canal. Estimates of average Boulder Feeder Canal flows if the pipeline were to be constructed are summarized In Table 5.

Table 5. Seasonal Boulder Feeder Canal Flow

Percent of Historical Canal Flow				
	April	May-August	September	October
Dry Year	80%	80%	47%	24%
Average Year	35%	85%	57%	9%
Wet Year	70%	70%	55%	20%

On an annual basis, BFC flows with the Carter Lake Pipeline in operation would be approximately 71.4%, 73.4% and 64.0% of historical canal flows for dry, average and wet years, respectively. The BFC will continue to be shut down in the winter and therefore, there will be no flow during the months of November through March.

Contamination levels in BFC water could rise due to less dilution as a result of reduced flows, but these future effects will be somewhat counteracted by ongoing efforts by Northern Water and the city to isolate existing outfalls to the BFC. The only two water utilities using the BFC for drinking water are Boulder and Left Hand Water District, and both are currently parties to the pipeline project, which, if constructed, would improve source water quality over current conditions. Dilution in the canal is of greater importance if the water is a direct drinking water supply, but it is not as great a concern if the water is used for irrigation or for reservoir storage.

The City of Boulder would still monitor water quality in the BFC and Boulder Reservoir as needed. However, there would not be an urgent need to track and predict contaminant events in the BFC and reservoir if water destined for treatment is transported via a pipeline.

With regard to the ongoing efforts to isolate existing outfalls, during 2008, the following activities to mitigate run-off to the Boulder Feeder Canal took place:

- Outfalls 79 and 90 located within the Cemex cement plant property were graded to an existing underpass.
- Outfalls 370 and 357 north of Prospect Road were graded to existing Crossings.
- Outfall 364 north of Prospect Road was crossed.
- Crossings of outfalls 379 and 372 were planned, but have not progressed due to down gradient landowner requests.

SWSP II is included in Boulder's Source Water Management Plan (in preparation) and in the 2009-2014 Capital Improvements Program. This project is an alternative included in the Integrated Evaluation of Boulder Reservoir Water Treatment Plant Source Water Protection and Treatment Improvements Study (Black & Veatch 2007). The study develops and evaluates alternatives for source water protection and long-term improvements to treatment processes.

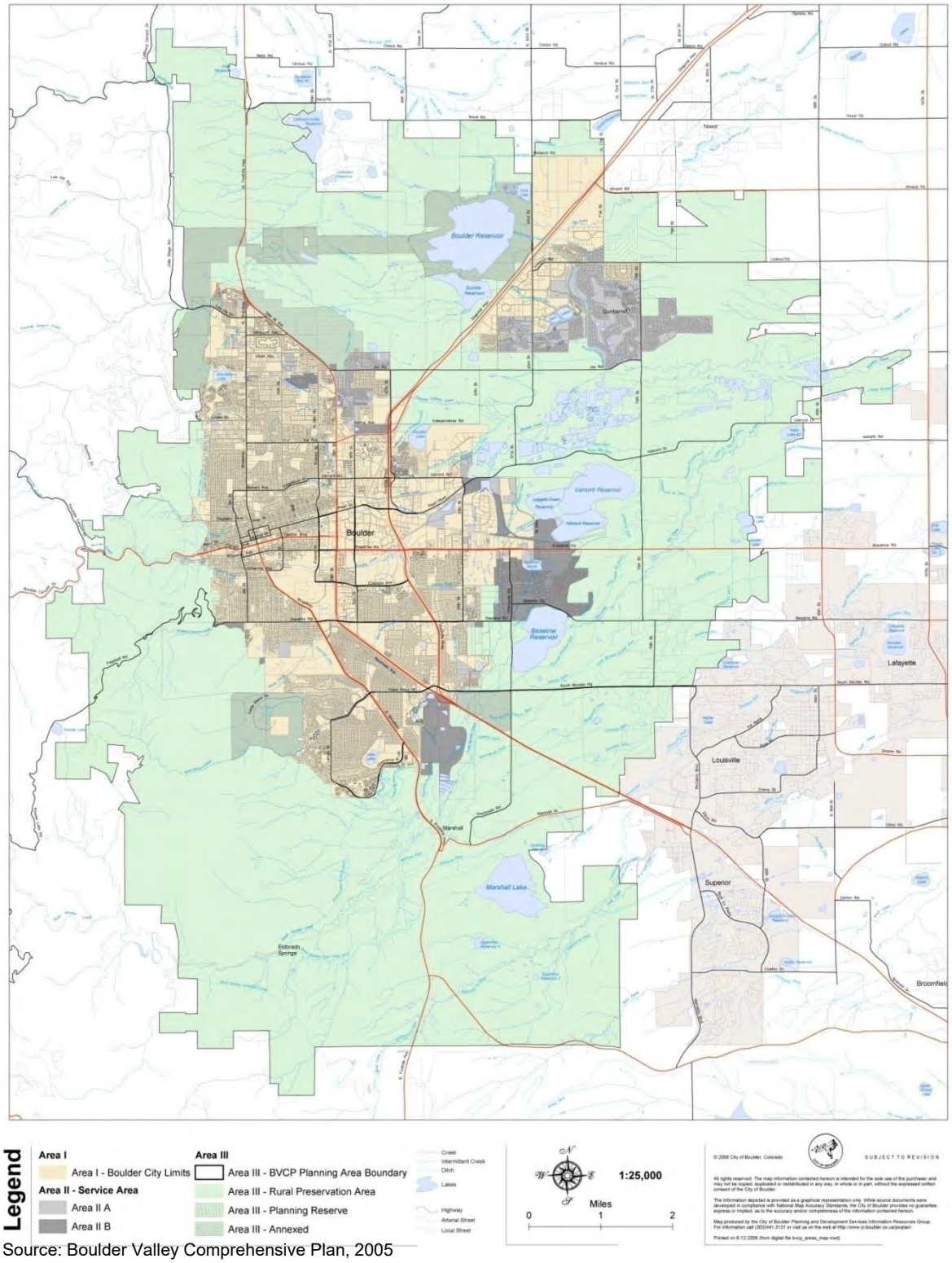
Since 1970, the City of Boulder and Boulder County have jointly adopted a comprehensive plan that guides land use decisions in the Boulder Valley. The core components of the BVCP are:

The BVCP policies guide decisions about growth, development, preservation, environmental protection, economic development, affordable housing, culture and the arts, neighborhood character, and transportation. The policies also help inform decision

makers about the manner in which services are provided, such as police, fire, emergency medical services, water utilities, flood control, and human services.

The BVCP Future Land Use and Area I, II, and III Maps defined the desired future land use pattern for the Boulder Valley regarding location, type, and intensity of development.

Map 6. Boulder Valley Comprehensive Plan Areas I, II, III



Source: Boulder Valley Comprehensive Plan, 2005

The City of Boulder provides a number of water conservation programs for residential users and homeowners' associations. These programs include rebates, education, outreach, and landscape and irrigation audits. The City's water conservation programs can be found at http://www.bouldercolorado.gov/index.php?option=com_content&view=article&id=12698&Itemid=360

Left Hand Water District

Left Hand Water District's (LHWD) service area includes land historically irrigated by the Left Hand Ditch Company, land historically irrigated by other ditches or with C-BT Project water, and a small area that had no historic irrigation through the Left Hand Ditch Company or C-BT Project. LHWD's service area primarily consists of the unincorporated areas between the City of Boulder, City of Longmont, Town of Firestone, Town of Frederick, Town of Dacono, and Town of Erie (Map 7). It also provides water to the Town of Frederick west of I-25.

Boulder County Resolution 96-83 previously approved a pipeline and pump station conveying summertime deliveries from the Boulder Feeder Canal to the Left Hand Valley Reservoir (LHVR) and Dodd WTP. The portion of the pipeline from the Boulder Feeder Canal to LHVR was never constructed. The Public Health Security and Bioterrorism Preparedness and Response Act of 2002 (Public Law 107-188) requirements, coupled with Boulder County's desire to utilize portions of the Boulder Feeder Canal ROW as a public trail, made an alternative to the 11-mile open channel Boulder Feeder Canal necessary. SWSP II provides an alternative solution that fulfills the need for this previously approved project. The project also provides a year-round water supply, secures water quality, and allows cost sharing for construction and maintenance.

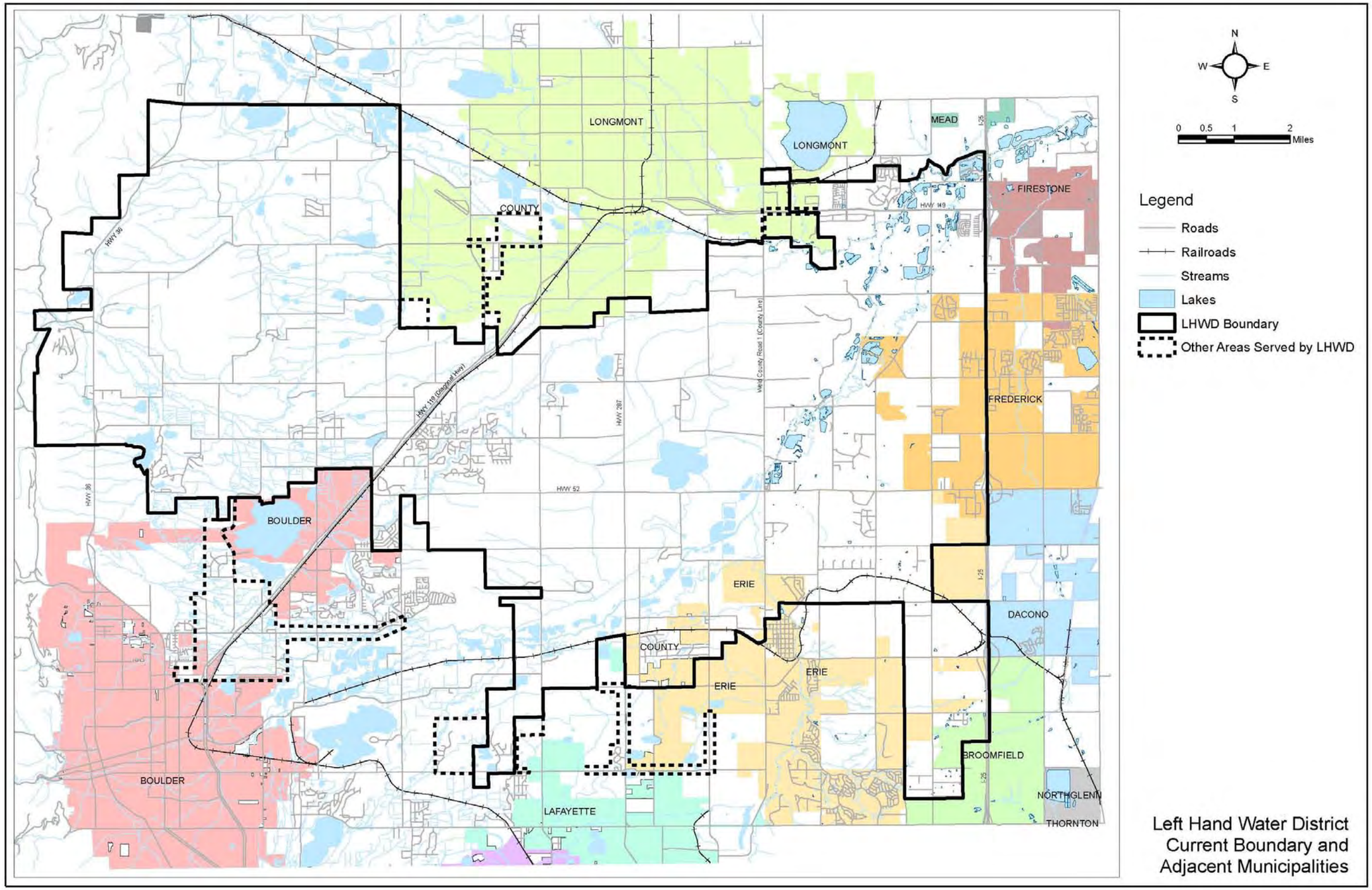
SWSP II is included in LHWD's Strategic Plan and Capital Improvement Program. LHWD's participation in SWSP does not increase the treatment capacity of LHWD's WTP. LHWD has an approved BOCO Resolution 2009-126, which includes connection to this proposed project. There are no other municipalities within the LHWD service area.

The total rated treatment capacity of LHWD is currently 15.5 MGD. Operational constraints common to water treatment facilities reduce the actual combined capacity to 13.5 MGD. With a historic maximum day demand of approximately 10 MGD, LHWD is operating at 74% of treatment capacity.

This project is a fundamental component in LHWD's Capital Improvements Program and long range strategic planning efforts. The concept of an additional pipeline to the Dodd WTP for the reasons stated in this application has been accepted in the approval of LHWD's 1996 1041 Application through Boulder County Resolution 96-83 as well as LHWD's Dodd WTP expansion and upgrade 1041 permit approval, BOCO Resolution 2009-126.

In an effort to promote water conservation, LHWD provides its indoor and outdoor residential users access to conservation rebates. In addition, LHWD provides a free irrigation inspection program called Slow the Flow Colorado. LHWD's water conservation programs can be found at http://lefthandwater.org/Water_Conservation.html

Map 7. Left Hand Water District Service Area



Source: Left Hand Water District 2006-2007 Treated Water Master Plan, March 9, 2007

Longs Peak Water District

The Longs Peak Water District (LPWD) service area was defined in 1991 when the company changed from an Association to a Title 32 Special District. All land previously served by the Longs Peak Water Association was incorporated into the service area of the newly formed LPWD. The service area consists of the unincorporated areas between the City of Longmont and LHWD on the south, I-25 on the east, the Town of Lyons on the west, and LTWD on the north. Additionally, those areas within the Town of Mead located west of I-25 and south of LTWD are within the LPWD service area.

LPWD provides domestic water to approximately 1,200 tap holders in an approximate 42-square mile area in western Weld and eastern Boulder counties (Map 8). Untreated irrigation water is also provided to approximately 100 tap holders in eastern Weld County. Currently, LTWD treats and delivers most of LPWD water. The LPWD Kugel Plant is now used as a "peaking plant" during the summer months. The LPWD Kugel Plant was originally designed to operate on a year-round basis; however, it has only been used seasonally over the past 20 years due to poor water quality available during fall/winter/spring from Pleasant Valley Reservoir (Terry Lake). The total rated capacity of the LPWD Kugel Plant is 0.75 MGD. The plant operates at about 75% capacity from time-to-time during peak periods in the summer.

Participation in SWSP II at 3 cfs will afford LPWD the opportunity to receive much higher quality water at its LPWD Kugel Plant located at 9875 Vermillion Road in Longmont, Colorado 80504. That treatment plant is currently fed via the Rough & Ready Ditch, which provides seasonal water of a far inferior quality than that to be received from SWSP II. Additionally, SWSP II will provide water on a year-round basis, which will allow LPWD to treat and deliver much more of its own water rather than relying on the purchased water capacity from LTWD.

Participation will also provide LPWD with some flexibility in delivering untreated irrigation water to those developments so designed during the "shoulder months", i.e., those months during which some irrigation water is needed before and after the local ditch companies deliver water. It is LPWD's goal to have all developments of size to incorporate untreated irrigation systems into their design, thereby reducing the need for treated water used for outdoor irrigation.

Currently LPWD water rights portfolio consists of the following:

1,726.8 Units C-BT Project Water
2 Shares Highland Ditch Company
4 Shares Supply Ditch Company
2/3 Share Rough & Ready Ditch Company
½ Share Pleasant Valley Reservoir
6 Shares Oligarchy Ditch Company

No additional acquisition of water rights is anticipated in conjunction with this project. No change in use of any currently owned water right is anticipated.

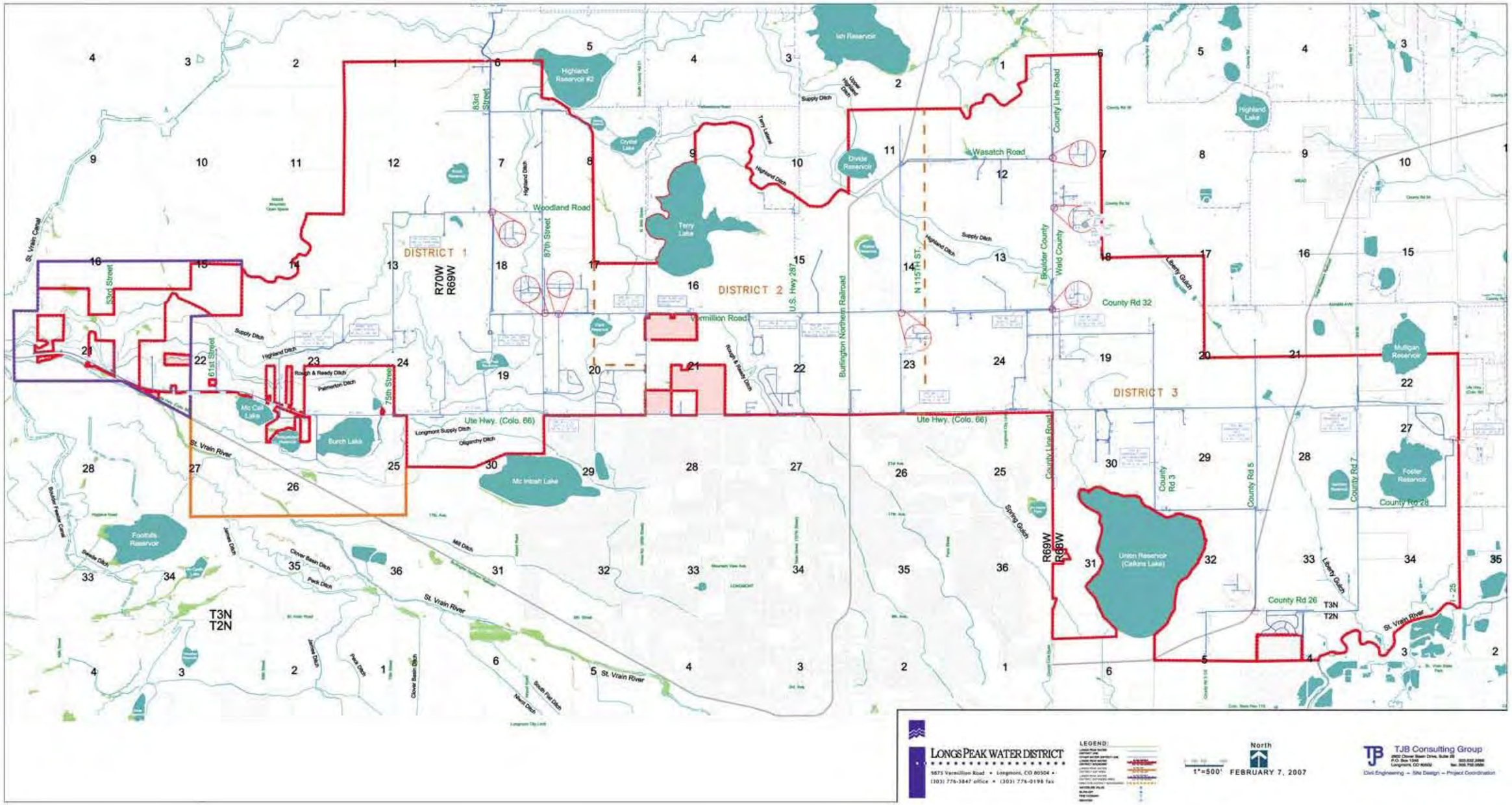
Town of Frederick

The Town of Frederick (Frederick) has adopted a comprehensive plan, including a Land Use Map, which was last revised on July 19, 2007. Frederick's service area is limited to Frederick (Map 9). As indicated on the Land Use Map, Frederick has no plans to develop land in Boulder County. Frederick and Boulder County recently adopted an IGA that stipulates how the two parties will cooperate on the development of land along the western edge of

Frederick. Frederick's participation in the SWSP II project would not result in any more water being available for future growth, but could provide an option for the location of future water treatment facilities. The major reason Frederick is participating in the SWSP II project is the fact that local water supplies are of such poor quality that they are not economically feasible to treat for potable water supplies.

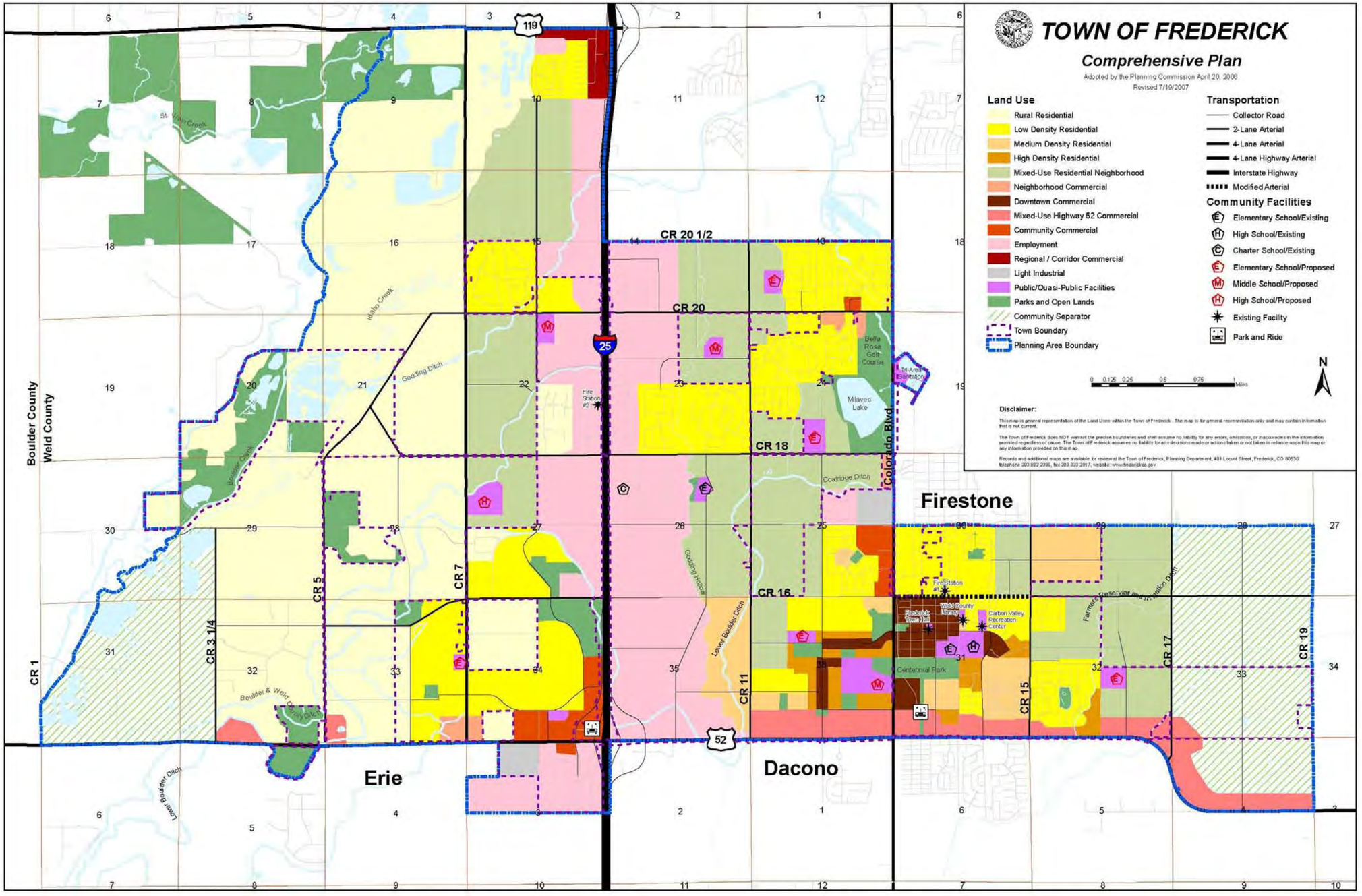
In August 2010, the Town of Frederick was awarded a grant to prepare the Town's water conservation plan. The conservation plan is expected to be completed in 2011.

Map 8. Longs Peak Water District Service Area



Source: Long's Peak Water District Map 2007

Map 9. Town of Frederick Service Area



Source: Town of Frederick Comprehensive Plan July 19, 2007

K. Population and Characterization of Users

City of Boulder

The City of Boulder (Boulder) currently provides treated water service to approximately 112,000 people residing inside and outside the city limits (BVCP). In addition, Boulder provides water to industries with about 100,000 employees. Approximately two-thirds of the water is used for indoor purposes and about one-third is for outdoor use. The residential sector (both single and multifamily) consumes 62% of the water, and 26% is used by commercial, industrial, and institutional sectors. About 3% of the water use is for the municipal sector with 9% for unaccounted uses, such as fire protection, leaks, or main breaks. This distribution is similar to other municipalities in the region. In 2006, a total of 20,311 acre-feet of water was delivered. This is a reduction from 2001, when drought restrictions began to limit use.

Left Hand Water District

It is estimated that the population currently served (using persons/household from the 2000 census for both Weld and Boulder Counties) is 19,088. This consists of 5,957 residential accounts and 296 commercial accounts. In addition, LHWD has committed to an additional 585 taps – the majority of which are located within Weld County. LHWD's participation in this project is not associated with any increase in capacity above that which has been previously reviewed by Boulder County. LHWD will apply for approval of additional capacity at the Dodd WTP separately in a future application.

LHWD's service area includes land historically irrigated by the Left Hand Ditch Company (LHDC), land historically irrigated by other ditches and C-BT Project water, and a small area that has no historic irrigation by LHDC or C-BT Project. LHWD's treatment facilities are situated such that the only sources of water that can be utilized are Left Hand Creek and C-BT Project water through the Boulder Feeder Canal.

The LHWD maintains a water bank, which is made up of shares of Left Hand Ditch Company stock and C-BT Project units. As shown in the list below, some of these rights are assigned to tap holders and some are held in reserve.

Colorado-Big Thompson Project
Owned: 6,750
Assigned: 5,312

Left Hand Ditch Company
Owned: 2,854
Assigned: 2,014

This project involves only the delivery of C-BT Project water from Carter Lake, which is currently delivered through the Boulder Feeder Canal.

Long's Peak Water District

In 2008, the Longs Peak Water District (LPWD) provided service to approximately 1,200 taps, with an estimated population of 2,800. Approximately 97% of LPWD taps are residential in nature, with the remaining 3% being dairy and commercial use. LPWD is currently committed to provide service to an additional 400 taps – approximately 50 of which are in Boulder County with the remaining committed services located in Weld County. With incorporation of untreated water irrigation systems in new development, and more efficient use of Longs Peak Water District Kugel Plant due to supply from SWSP II, little if any additional treatment capacity will be needed in the foreseeable future.

Currently approved development plans in the Weld County area will result in a population increase of about 720. Approved developments in the Boulder County area will result in an increase in population of about 120. LPWD previously committed to provide service to these developments, and the SWSP II is/was not a factor in those commitments.

Town of Frederick

In 2007, the Town of Frederick (Frederick) had an estimated population of 7,997, and is expected to be built out in the year 2030 at a population of 80,000. With 6 cfs, the SWSP II is anticipated to fulfill a small portion of Frederick's projected water supply demand. The SWSP II will serve only a small portion of Frederick's future water supply needs.

L. Environmental Impact

Land Use

The project is located in undeveloped rural Boulder County, an area primarily consisting of rolling hills with pasture/hay fields and rural estates. The SWSP II route crosses through a number of land use types, including rangeland/agriculture, conservation land, other public land, rural estate, rural residential, and industrial. Existing land use is shown on Reference Maps A-E in Appendix III for the SWSP II connection to the City of Boulder's 63rd Street water treatment plant. A similar pattern of land use occurs along the eastern segment of the project. Land use along this segment is depicted in Reference Maps F-H in Appendix III.

In addition, the project crosses through incorporated areas in the City of Longmont and City of Boulder. These areas have a variety of zoning classes, including Industrial-Manufacturing, Public, Business/Light Industrial, General Industrial, Residential Planned Unit Development, Agriculture, Estate Residential, and Rural Residential (Map 10).

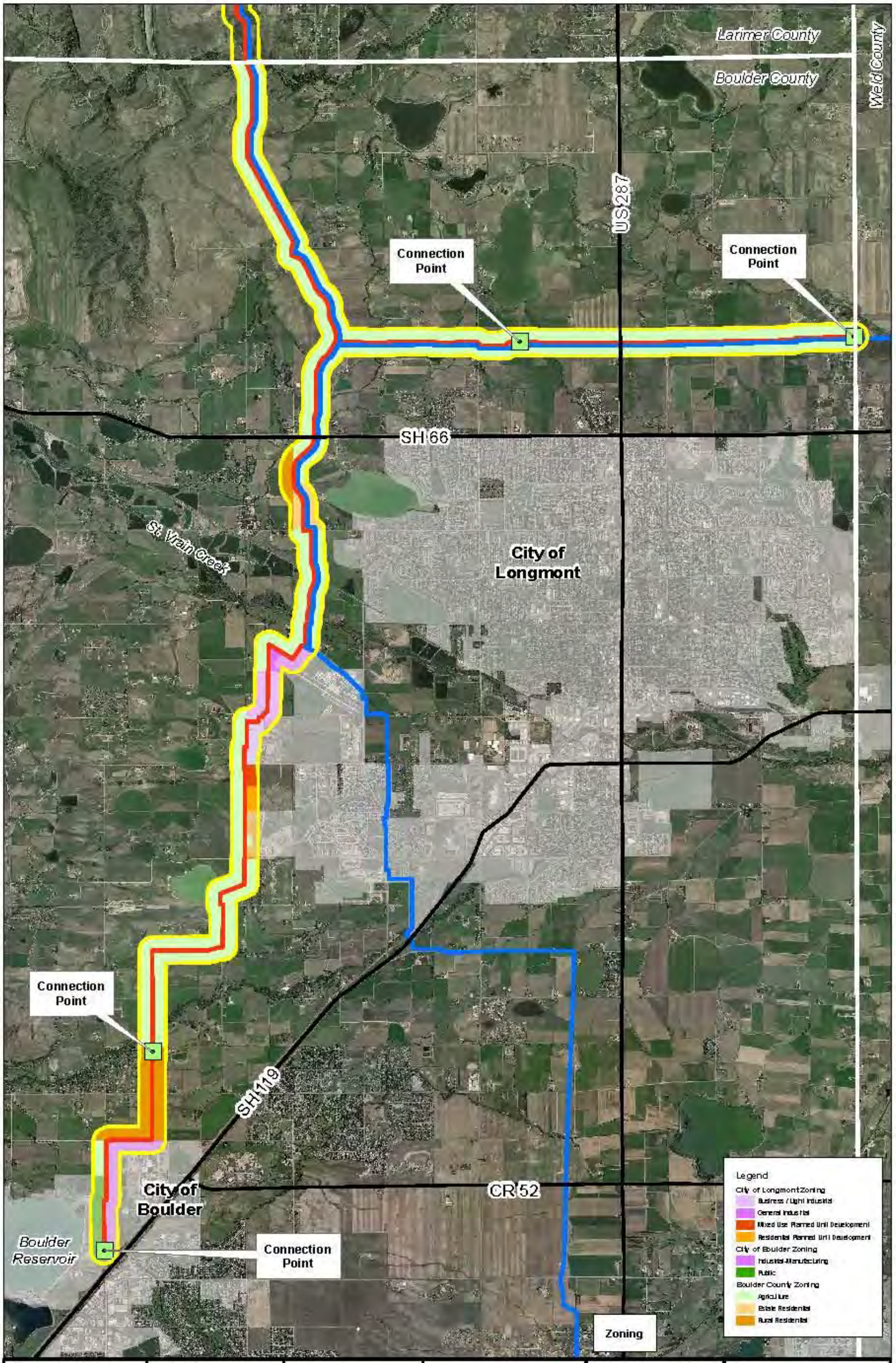
The project will have both short and long-term effects on land use. In areas where the pipeline will be located within the existing SWSP pipeline easement, impacts will be limited to short-term disruptions associated with construction activities, including increased noise, equipment operation and storage, and temporary disruptions of traffic flow. At an anticipated construction rate of 200-400 feet per day, the disruption at any one location will be relatively short in duration. Approximately half of the construction within Boulder County will be limited to short-term disturbances with no additional easement acquisition required and, therefore, no long-term effect on future land use. The construction zone would be restored to preconstruction conditions as agreed to by each property owner, including fences, drain tile, irrigation systems, landscaping, private roads, and other improvements.

At locations south of the Vance Brand Municipal Airport in Longmont, both short and long-term effects to land use will occur. Short-term effects will be similar to those described above. Long-term effects will result from the acquisition of a new permanent easement, which prohibits certain types of uses within the easement. Agricultural uses can continue within the easement, but construction of permanent buildings or structures would be prohibited. Planting of trees and shrubs will not be permitted unless granted by Northern Water in advance. As noted previously, the pipeline was routed at most locations requiring new permanent and temporary construction easements adjacent to existing road rights-of-way, land lines, and other edges where the disruption of existing and future uses is minimized.

The project would not require the removal of any existing residences or other permanent buildings.

The pipeline alignment crosses through a total distance of approximately 17.5 miles of cultivated lands. Of this, approximately 0.3 mile is designated by the Natural Resources Conservation Service as farmland of statewide importance and 1.3 miles through land designated as prime farmland if irrigated. The Boulder Comprehensive Plan shows approximately 17.5 miles of pipeline crossing Significant Agricultural Land, including 1.9 miles of land of statewide importance, 7.5 miles of land of local importance, and 8.1 miles of lands of national importance. For nearly all of this distance, the alignment is located at field edges along roads or other features.

Agricultural uses will not be permanently affected by this project. Some pastures and cultivated areas will be temporarily disturbed by construction activities. The area temporarily disturbed by pipeline construction will be restored to pre-construction conditions. Prior to construction, agricultural improvements such as drain tiles and irrigation will be identified and either avoided to the extent practical or restored following construction. Topsoil will be segregated from lower horizon soils and sub-soils, stockpiled, and replaced in its natural order to ensure that unsuitable subsoil does not mix with the fertile topsoil. The ground contours will be restored and uncultivated areas will be revegetated with desirable species. If undesirable soil settling occurs, such as in areas that may disrupt flood irrigation, Northern Water will return to fix the grade.



Map Number & Title:	Project Title & Applicant	Consultant	Engineer	Preparation Date: 1/20/2011
Map: 10 **Land Use Zoning**	Southern Water Supply Project II NCWCD 220 Water Ave. Berthoud, CO 80513 (970) 532-7700	AECOM 240 East Mountain Ave. Fort Collins, CO 80524 (970) 484-6073	Dewberry-Integra Engineering 1095 South Monaco Parkway Denver, Colorado 80224 (303) 825-1802	Revision Date 1: Revision Date 2: Revision Date 3:

There is some interest by the City of Boulder to co-locate a trail and fire-fighting access within the pipeline easement at the City of Boulder Open Space near Boulder Reservoir. In addition, the City of Longmont has shown interest to co-locate and co-construct a water line north of the Longmont Vance Brand Municipal Airport. Northern Water will coordinate with both cities to consider the potential for cooperative agreements.

Approximately 7 of the 21 miles of SWSP II pipeline in Boulder County will be constructed within the existing SWSP easement. Tables 6 through 12 list other utility easements that parallel the selected SWSP II route. For the most part, SWSP II is located outside of existing road rights-of-way and parallels a number of roads. Where SWSP II crosses an existing road right-of-way, the crossing will be bored and jacked under the road if required. The SWSP II will potentially enter into existing Boulder County road right-of-way at four locations, including:

- St. Vrain Road west of the airport – Existing road right-of-way for 200 – 500 feet.
- Two or three structures south of Clover Basin drainage could push the pipeline into the right-of-way for a short distance.
- Along 75th Street – One or two structures north of Nelson Road could push the pipeline into the right-of-way for a short distance.
- Monarch Road at 63rd Street – There is a short section (200 feet±) where the pipeline may need to jump to the south of Monarch Road to avoid a residence, and it may need to push into the right-of-way for a few hundred feet.

Map 11 shows the locations of each of the road crossings as well as the four potential encroachments into the existing road rights-of-way. The temporary construction into Boulder County road rights-of-way will result in limited closures of roads. Construction will comply with all of the conditions set forth in an approved Boulder County Traffic Control Plan and Traffic Management Plan.

Any future development within Boulder County that might be served by the project will be subject to Boulder County review and will be required to comply with the policies and guidance contained within the Boulder County Comprehensive Plan. Similarly, future development within the City of Boulder will be done in a manner that is consistent with the BVCP, a joint plan between the City of Boulder and Boulder County.

Overall, the project complies with the Boulder County Comprehensive Plan, resulting in no long-term adverse effects to existing land uses and serving future development that is consistent with the land use framework defined in the plan. Four of the five project participants serve areas outside of Boulder County. Based on the amount of water to be received by each of the participants and how much is estimated for residential growth, the SWSP II is capable of supporting an increased population of approximately 18,100 in neighboring Weld County (Table 11). The majority of this new population would be located in the Town of Frederick along the I-25 corridor. Frederick's comprehensive plan provides for the development of major employment centers along the I-25 corridor as well as parks, trails, and other services. Based on these plans and the community's easy access to the Denver metropolitan area, it is anticipated that potential future impacts on Boulder County facilities and services will be minimal.

Larimer County
Boulder County
Weld County
US 287
Woodland Rd.
Connection Point
Connection Point
N. 87th St.
US 287
N. 115th St.
C and S Railroad
Vermillion Rd./CR 6
CO 66
SH 66
Hygiene Rd.
St. Vrain Creek
City of Longmont
BN Railroad
N. 75th St.
St. Vrain Rd.
75th St.
Nelson Rd.
Pike Rd.
N. 73rd St.
Connection Point
Nimbus Rd.
Niwot Rd.
SH 119
Monarch Rd.
City of Boulder
CR 52
Boulder Reservoir
Connection Point
Boring Location
Right-of-Way Encroachment

Map Number & Title:	Project Title & Applicant:	Consultant:	Engineer:	Preparation Date: 1/20/2011	Selected Pipeline Alignment Existing SWSP Pipeline Study Area (250 Ft Buffer)
Map: 11 **Road and Railroad Crossings**	Southern Water Supply Project II NCWCD 220 Water Ave. Berthoud, CO 80513 (970) 532-7700	AECOM 240 East Mountain Ave. Fort Collins, CO 80524 (970) 484-6073	Dewberry-Integra Engineering 1095 South Monaco Parkway Denver, Colorado 80224 (303) 825-1802	Revision Date 1: Revision Date 2: Revision Date 3:	0 0.5 1 Miles 1:50,000

Table 6. Utilities on North 75th Street - St. Vrain Road to Nelson Road

No.	Existing Utility	Utility Owner	Approximate Location	Above or Below Grade	Anticipated Typical Depth
1	Electric	City of Longmont Power	West ROW line	Above (overhead)	N/A
2	Potable water	City of Longmont	East side of ROW	Below (buried)	4-8 ft.
3	Potable water	Left Hand Water District	East and west sides of ROW	Below (buried)	4-8 ft.
4	Gas	Xcel	Within ROW	Below (buried)	3-8 ft.
5	Telephone/fiber-optic	Qwest	Within ROW	Below (buried)	2-10 ft.
6	Cable TV	Comcast	Within ROW	Above and/or below	2-4 ft.

*No research was completed for the highlighted utilities, but they are anticipated to also be within the right-of-way.

Table 7. Utilities on North 75th Street - Nelson Road to Plateau Road

No.	Existing Utility	Utility Owner	Approximate Location	Above or Below Grade	Anticipated Typical Depth
1	Electric	Poudre Valley REA	West ROW line	Above (overhead) and below (buried)	N/A and **3-8 ft.**
2	Potable water - 8" dia.	Left Hand Water District	East and west sides of ROW	Below (buried)	4-8 ft.
3	Gas	Xcel	Within ROW	Below (buried)	3-8 ft.
4	Telephone/fiber-optic	Qwest	Within ROW	Below (buried)	2-10 ft.
5	Cable TV	Comcast	Within ROW	Above and/or below	2-4 ft.

*No research was completed for the highlighted utilities, but they are anticipated to also be within the right-of-way.

Table 8. Utilities on North 73rd Street - Plateau Road to Holland Ditch

No.	Existing Utility	Utility Owner	Approximate Location	Above or Below Grade	Anticipated Typical Depth
1	Electric	Poudre Valley REA	West ROW line	Above (overhead)	N/A
2	Potable water - 4" dia. Asbestos cement	Left Hand Water District	West ROW	Below (buried)	4-8 ft.
3	Gas	Xcel	Within ROW	Below (buried)	3-8 ft.
4	Telephone/fiber-optic	Qwest	Within ROW	Below (buried)	2-10 ft.
5	Cable TV	Comcast	Within ROW	Above and/or below	2-4 ft.

*No research was completed for the highlighted utilities, but they are anticipated to also be within the right-of-way.

Table 9. Utilities on North 67th Street - Oxford Road to Nimbus Road

No.	Existing Utility	Utility Owner	Approximate Location	Above or Below Grade	Anticipated Typical Depth
1	Potable water - 16 " dia.	Left Hand Water District	West ROW	Below (buried)	4-8 ft.
2	Telephone/fiber-optic	Qwest	Within ROW	Below (buried)	2-10 ft.
3	Cable TV	Comcast	Within ROW	Above and/or below	2-4 ft.

*No research was completed for the highlighted utilities, but they are anticipated to also be within the right-of-way.

Table 10. Utilities on Monarch Road - North 63rd Street to ¼ Mile East

No.	Existing Utility	Utility Owner	Approximate Location	Above or Below Grade	Anticipated Typical Depth
1	Electric	Xcel	South ROW line	Above (overhead)	N/A
2	Potable water	Left Hand Water District	North ROW	Below (buried)	4-8 ft.
3	Gas	Xcel	Within ROW	Below (buried)	3-8 ft.
4	Telephone/fiber-optic	Qwest	Within ROW	Below (buried)	2-10 ft.
5	Cable TV	Comcast	Within ROW	Above and/or below	2-4 ft.

*No research was completed for the highlighted utilities, but they are anticipated to also be within the right-of-way.

Table 11. Utilities on North 63rd Street - Monarch Road to Boulder Reservoir WTP

No.	Existing Utility	Utility Owner	Approximate Location	Above or Below Grade	Anticipated Typical Depth
1	Electric	Xcel	East ROW line	Above (overhead)	N/A
2	Electric	Poudre Valley REA	West ROW line	Above (overhead)	N/A
3	Potable water - 1 1/2" dia.	Left Hand Water District	East ROW	Below (buried)	4-8 ft.
4	Potable water - 12" dia.	City of Boulder	East ROW	Below (buried)	4-8 ft.
5	Gas	Xcel	West ROW	Below (buried)	3-8 ft.
6	Telephone/fiber-optic	Qwest	Within ROW	Below (buried)	2-10 ft.
7	Cable TV	Comcast	Within ROW	Above and/or below	2-4 ft.

*No research was completed for the highlighted utilities, but they are anticipated to also be within the right-of-way.

Table 12. Summary of Potential Growth Outside of Boulder County

Participant	SWSP II Capacity	AF/Year @ 724 AF/cfs	% intended to serve new residential growth	Future Households Served @ (.5 AF/HH)	Population Served @ 2.78/HH	% of Water District outside of Boulder County	Estimated population growth outside of Boulder County supported by SWSP II
City of Boulder	25 cfs	18,100 AF	0%	36,200 HH	100,636	0%	0
Left Hand Water District	11 cfs	7,964 AF	0%	15,928	44,280	30%	0
Longs Peak Water District	3 cfs	2,172 AF	0%	4,344 HH	12,076	NA	0
Town of Frederick	3 cfs	2,172 AF	100 %	4,344 HH	12,076	100%	12,076

Water Resources

Floodplain

The only identified hazard areas crossed by the pipeline are stream crossings and their associated floodplains. As previously described, the pipeline route crosses through a number of floodplain hazards that are identified from the Boulder County GIS data. The floodplains identified from the data include Little Thompson River, St. Vrain River, Dry Creek No. 1, Left Hand Creek, and Dry Creek No. 2. Although these hazards are present, the pipeline will not adversely affect the floodplain, nor will it be affected by flood events. The pipeline will be completely buried and will not change the ground topography or floodplain capacity. The pipeline will be constructed at river crossings to withstand any potential scouring. All structures, such as air release vents (ARV) and blow off assemblies, will be installed below grade and accessed through flush level manholes. All grades will be returned to preconstruction conditions.

Flood Hazard

The Boulder County Comprehensive Plan Geologic Hazards and Constraints Map indicates that Little Thompson River, St. Vrain River, and Left Hand Creek all have a moderate geologic hazard with regard to flash-flooding. In addition, the Little Thompson River, St. Vrain River, Dry Creek No. 1, Left Hand Creek, and Dry Creek No. 2 all have defined 100-year floodplains (see Reference Maps I-P in Appendix IV.). The majority of the project is located outside of these areas. The project will be designed to mitigate any potential risks associated with flash-flooding and scouring. The pipeline will be buried and there will not be any above ground structures in these areas. All necessary ARV's and blow off assemblies will be located below ground and accessed through a flush mounted manhole. The pipeline itself will be buried to a minimum of 4 feet. As a result of these measures, the project will not have any effect on the pattern or intensity of flooding.

Surface Water

The selected pipeline route crosses a number of natural surface waters and irrigation ditches, including the Little Thompson River, St. Vrain River, Dry Creek No. 1, Left Hand Creek, Dry Creek No. 2, Supply Ditch, Highland Ditch, Rough & Ready Ditch, Longmont Supply Ditch, etc. (Maps I through P). These reaches of surface water are not listed on the Colorado Department of Public Health and Environment, Water Quality Control Commission, classifications and numeric standards.

Water Quality

The project will have no adverse effects on water quality. Best management practices (BMPs) will be used during construction; and following construction, the disturbed area will be restored with native vegetation, where applicable. A storm water discharge and construction dewatering permit will be obtained from the Colorado Department of Public Health and Environment for construction at drainage crossings. These permits will include the preparation of a Storm Water Management Plan (SWMP) and BMPs to prevent storm water runoff and sediment in disturbed areas from reaching nearby waterways. BMPs will be consistent with the Urban Drainage and Flood Control District's Urban Storm Drainage Criteria Manual, Volume 3. Typical measures employed may include detention basins, silt fences, hay bales, wattles, and hydro mulch. These measures will deflect runoff, collect sediment, and allow infiltration. Storm water and erosion control measures will be carefully monitored during construction to ensure their effectiveness.

Ground Water

Where construction activities intercept high ground water, the trench will be dewatered and routed to settling basins in upland areas to allow infiltration and collection of sediment. No

discharge to the creeks will be allowed. Effects to ground water will be minor, short term, and limited to the construction phase of the project. No long-term effects to ground water or surface water are anticipated. Trench plugs will be placed around the pipeline to prevent water from flowing down the porous material in the trench, thus eliminating potential effects on the ground water movement.

All water that will be delivered by the SWSP II pipeline consists of existing Windy Gap and C-BT Project water rights. No additional water rights are needed to implement the project.

Wetland and Riparian Areas

The project crosses riparian vegetation and wetlands at multiple locations, including perennial streams, intermittent and ephemeral drainages, irrigation ditches, isolated wetlands, and associated riparian areas (Reference Maps I-P in Appendix IV.). The table in Appendix V shows the dominant vegetation present at each crossing. The vegetation within the riparian and wetland areas consists of three primary vegetation types, including riparian woodland, riparian shrubland, and emergent wetland. These plant communities are often intertwined and transition from one to the other along a hydrological gradient.

The riparian woodland plant community primarily consists of mature trees such as plains cottonwoods (*Populus deltoids*), narrow leaf cottonwood (*Populus angustifolia*), and crack willow, (*Salix fragilis*). These species occur where suitable hydrology occurs, primarily along natural drainages or irrigation ditches. Some of these species were planted as individual trees or as windbreaks along irrigation ditches. These woodlands and some individual trees provide nesting and roosting habitat for raptors and other bird species. The riparian shrubland community primarily consists of wood rose (*Rosa woodsii*), coyote willow (*Salix exigua*), golden current (*Ribes aureum*), skunkbush (*Rhus trilobata*), virgin's bower (*Clematis ligusticifolia*), and chokecherry (*Prunus virginiana*).

The emergent wetland plant community is often dominated by species such as narrowleaved cattail (*Typha latifolia*), Nebraska sedge (*Carex nebrascensis*) or four squares, common threesquare (*Schoenoplectus pungens*), Emory's sedge (*Carex emoryi*), and reed canarygrass (*Phalaris arundinacea*). Other species present include smooth brome (*Bromus inermis*), Canada wild rye (*Elymus canadensis*), foxtail barley (*Critesion jubatum*), western wheatgrass (*Pascopyrum smithii*), and Russian olive (*Elaeagnus angustifolia*).

The project will temporarily disturb areas within these wetland and riparian corridors. Many of these crossings have already been disturbed by previous projects, including the original SWSP that has been subsequently restored. A restoration plan will be developed for new disturbances at each crossing.

Jurisdictional waters of the United States (U.S.) and wetlands occur at several locations where the pipeline crosses a drainage. Impacts to these jurisdictional waters will require a Section 404 permit under the Clean Water Act. A Pre-Construction Notification for the pipeline impacts has been sent to the U.S. Army Corps of Engineers (Corps) and is expected to be permitted under Nationwide Permit (NWP) 12 for utility lines. NWP 12 permits up to half an acre of permanent impact to waters of the U.S. at each crossing. All impacts to waters of the U.S. will be temporary in nature and no permanent impacts will result. The ground contours will be restored, topsoil will be salvaged and replaced, and the disturbance will be revegetated with native species.

The City of Boulder also regulates disturbance of stream margins or buffers under its wetland ordinance. This ordinance applies to all wetlands within its incorporated boundary or on land owned wholly or in part by the City of Boulder. Some wetlands and jurisdictional crossings also meet the City of Boulder wetland criteria, which require the presence of two of the three Corps wetland criteria (vegetation, hydrology, and soils).

All of the wetlands and jurisdictional crossings are shown on Reference Maps I-P in Appendix I. and are listed in Appendix II. These wetlands and associated riparian buffers were avoided where possible; however, there is no way to avoid the crossing of all drainages (many of which have a generally west to east orientation) with a linear pipeline that generally runs north to south. Impacts were minimized where possible. For example, the crossing point of Left Hand Creek was selected to avoid most of the cottonwoods present.

During the routing feasibility study, Colorado Natural Heritage Program (CNHP) performed a search through its Biodiversity Tracking and Conservation System database (BIOTICS) for natural heritage elements (occurrences of significant natural communities and rare, threatened, or endangered plants and animals) documented in the vicinity of the project alignments. CNHP species identified within the selected route easement are shown in Table 13 and CNHP sensitive vegetation communities are shown in Table 14.

In addition, CNHP has identified several areas as Network of Conservation Areas[2] (NCA) or Potential Conservation Areas[3] (PCAs), including the Little Thompson River and St. Vrain Creek corridors (Reference Map I and K in Appendix IV). NCAs and PCAs have been identified because of their biological values, ecological processes, and habitat integrity.[4] These areas provide large, well developed habitats that are used by a variety of wildlife and contain occurrences of rare species elements. Both of the PCA stream crossings were previously crossed by the original SWSP, and the SWSP II would be constructed in the existing easement. Photographs of the crossings at the two riverine PCAs are shown below in photographs 5 and 6.

[2] **Network of Conservation Areas (NCA) will fit one of the following definitions:**
A. A landscape area that encompasses Potential Conservation Areas (PCAs) that share similar species or natural communities and ecological processes. NCAs include unoccupied or unsurveyed areas that are within the same ecological system that the species or natural communities require. NCAs contain PCAs with an obvious repeating pattern (that is, the same species or natural communities are in each associated PCA).
B. A mostly intact, lightly fragmented landscape that supports wide-ranging species and large scale disturbances. NCAs include unoccupied or unsurveyed areas that demonstrate the connectivity of the landscape. NCAs contain PCAs that may occur at a variety of ecological scales.

[3] **Potential Conservation Areas**
PCAs identify lands that capture the ecological processes that are necessary to support the continued existence of a particular element or suite of elementsof natural heritage significance.
The proposed boundary does not automatically exclude all activity. Activities within PCAs should be carefully considered to ensure that ecological processes are not disrupted.

Photograph 5. Proposed crossing of the Little Thompson River (existing SWSP easement)

Photograph 6. Proposed crossing of the St. Vrain River (existing SWSP easement)

Table 13. Colorado Natural Heritage Program Sensitive Species February 12, 2009 within selected route easement in Boulder County

Scientific Name	Common Name	G Rank/ S Rank	F/S Status	Habitat	Occurrence
Melanerpes lewis	Lewis's woodpecker	G4/S4	FC	Open forest and woodland, (primarily coniferous)	Potential habitat occurs at riparian crossings with riparian woodland; none observed.
Zapus hudsonius preblei	Preble's meadow jumping mouse	G5-T2/S1	FT/ ST	Riparian shrubland	Potential habitat occurs; none found during focused surveys.
Cynomys ludovicianus	black-tailed prairie dog	G4/S3	FC/SC	Grassy plains and prairies	Potential habitat occurs; specimens found in several selected alignment areas.
Anodontoides ferussacianus	cylindrical papershell	G5/S2	SC	Shallow creeks, springs, or lakes with muddy or sandy bottoms	Potential habitat occurs; none observed.
Hybognathus hankinsoni	brassy minnow	G5/S3	ST	Cool gravelly streams with a sediment overlay and aquatic vegetation	Potential habitat occurs; none observed.
Notropis cornutus	common shiner	G5/S2	ST	Cool gravelly streams that are not covered with sediment but are shaded by overhanging vegetation	Potential habitat occurs; specimens found at selected alignment crossings of Little Thompson River.
Rana pipiens	Northern leopard frog	G5/S3	SC	Wet meadows; banks and shallows of lakes, ponds, and rivers	Potential habitat occurs; none observed.

FT – Federally threatened
FC – Federal species of concern (This is the term used in the data provided by CNHP. We assume this is the former C2 category that is no longer recognized by USFWS.)
ST – State threatened
SC – State Species of Special Concern
G4 - Apparently secure globally, though it might be quite rare in parts of its range, especially at the periphery.
G5 - Demonstrably secure globally, though it may be quite rare in parts of its range, especially at the periphery.
TRINOMIAL RANK (T): used for subspecies or varieties. These taxa are ranked on the same criteria as G1-G5:
T2 - Imperiled globally because of rarity (6 to 20 occurrences) or because of other factors demonstrably making it very vulnerable to extinction throughout its range. (Endangered throughout its range).
S1 - Critically imperiled in state because of extreme rarity (5 or fewer occurrences, or very few remaining individuals, or because of some factor of its biology making it especially vulnerable to extirpation from the state. (Critically endangered in state).
S2 - Imperiled in state because of rarity (6 to 20 occurrences) or because of other factors demonstrably making it very vulnerable to extirpation from the state. (Endangered or threatened in state).
S3 - Vulnerable in state (21 to 100 occurrences).
S4 – Apparently, secure in state; (usually > 100 occurrences)

Table 14. Colorado Natural Heritage Program Sensitive Vegetation Communities February 12, 2009 within selected route easement in Boulder County.

Scientific Name	Common Name	G Rank/S Rank	Occurrence
Populus deltoids – (*Salix amygdaloides*) / *Salix* (*exigua,* interior) Woodland	Plains Cottonwood Riparian Woodland	G3G4/S3	One potential occurrence
Distichlis spicata - Herbaceous Vegetation	Salt Meadows	G5/S3	One potential occurrence
Suaeda moquinii - Shrubland	Salt Meadows	G5/S2	One potential occurrence

G3 – Globally vulnerable; typically 21 to 100 occurrences
G4 - Apparently secure globally, though it might be quite rare in parts of its range, especially at the periphery.
G5 - Demonstrably secure globally, though it may be quite rare in parts of its range, especially at the periphery.
S2 - Imperiled in state because of rarity (6 to 20 occurrences) or because of other factors demonstrably making it very vulnerable to extirpation from the state. (Endangered or threatened in state).
S3 - Vulnerable in state (21 to 100 occurrences).

Terrestrial and Aquatic Animals and Habitat

Project biologists completed an inventory of the natural resources within the project alignment. A summary of the sensitive environmental issues is provided in Table 15 and are discussed in subsequent sections of this report. The project avoids all areas identified in the Boulder County Comprehensive Plan as critical wildlife habitat areas. However, the SWSP II does cross the St. Vrain River riparian corridor near an area designated as a significant riparian corridor in the comprehensive plan. This crossing is within the existing SWSP easement, which is being used as a drivable stream crossing. The selected route also crosses near a Great Plains Salt Meadow, and the Left Hand Creek Critical Wildlife Habitat; however, these specific areas are avoided.

Table 15. Summary of sensitive environmental issues

Status	Criteria	Determination
Federally Threatened and Endangered (T&E) Species	Critical or potential habitat for federally designated threatened or endangered species.	Potential habitat present. None found within study area in focused surveys.
State T & E Species and Species of Special Concern	Potential habitat for, or known locations of, state T&E species or species of special concern.	Potential habitat present. Two of six species observed within selected alignment.
Colorado Natural Heritage Program (CNHP) Tracked Species	Potential habitat present for CNHP tracked species	Potential habitat present. Focused surveys performed for some species, but none found within selected alignment
Migratory Bird Treaty Act Protected Species	Potential habitat and nesting sites present for raptors or other protected passerine and waterfowl species.	Several raptor nests present. Potential passerine and waterfowl breeding habitats present.

Threatened and Endangered Species

Preble's Meadow Jumping Mouse

The Preble's meadow jumping mouse (PMJM) (*Zapus hudsonius preblei*) is listed as threatened under the federal Endangered Species Act. PMJM inhabit areas containing riparian vegetation with extensive tree and shrub cover that provide good potential habitat. Previous studies indicate that a number of riparian corridors crossed by the selected route may contain suitable habitat. Based on additional targeted surveys performed by a PMJM specialist, potential high quality habitat exists at the Little Thompson River, St. Vrain River, and Left Hand Creek. Poor habitat was observed at several ditch, drainage, and creek crossings, but the PMJM specialist did not recommend trapping in these locations. Potential habitat areas not previously trapped were trapped by the specialist in accordance with U.S. Fish and Wildlife Service (USFWS) protocol. All other areas were disqualified for trapping due to the lack of habitat or lack of connectivity. The analysis of each crossing for PMJM habitat is shown in the table in Appendix II. No PMJM were found and the project is not expected to have any effect on this species. The USFWS has been consulted on this trapping effort, and they concur with the recommendations for PMJM trapping and accept the survey findings.

Ute Ladies'-Tresses Orchid

The Ute ladies'-tresses orchid (*Spiranthes diluvialis*) is a federally threatened plant species under the Endangered Species Act. The Ute ladies'-tresses orchid occurs in seasonally moist alluvial soils and wet meadows near springs, lakes and streams, and associated floodplains below 6,500 feet elevation. A number of wetland crossings fit this description along the selected route. An analysis of potential habitat at each crossing is summarized in the table in Appendix II. All of the crossing locations were surveyed for Ute ladies'-tresses orchids during the orchid's blooming period (conducted on August 9 and 17). A reference site was visited near Cherryvale Road in Boulder for comparison before each site survey. No orchids were found, a CNHP search does not list occurrences of this species within the selected alignment easement, and the project is not expected to have any effect on this plant species.

Brassy Minnow

The brassy minnow (*Hybognathus hankinsoni*) is a small, state-threatened species of fish that prefers cool, gravelly streams with a sediment overlay and aquatic vegetation. It has been found in the lower St. Vrain River and is predicted to occur at river crossings within the selected alignment. BMPs such as those found in the Urban Drainage and Flood Control District's Urban Storm Drainage Criteria Manual, Volume 3 will be applied to river and stream crossings to minimize any potential impacts to this fish or its habitat and minimize the duration of temporary impact. Streams will be crossed using the open trench method during the winter months when stream flows are at their lowest levels. Sediment control measures, such as berms, silt fence, or filter fabrics will be used to minimize the downstream migration of sediments and the inadvertent trapping of aquatic species.

Common Shiner

The common shiner (*Notropis cornutus*) is a small, state-threatened species of fish that prefers cool gravelly streams, which are not covered with sediment but are shaded by overhanging vegetation. Shiners are only found in tributary streams to the South Platte River, including the St. Vrain River, and this species is predicted to occur at river crossings within the selected alignment. Dead common shiners were observed by field personnel in a side pool of the Little Thompson River. BMPs will be applied to river and stream crossings to minimize any potential impacts to this fish or its habitat. Minimization measures discussed for the brassy minnow will also be used

Colorado State Species of Special Concern

Black-tailed Prairie Dog

Black-tailed prairie dogs (*Cynomys ludovicianus*) are undergoing review by USFWS for possible listing, and are currently listed as a Colorado species of special concern due to loss of habitat in the state, their function as prairie and grassland ecosystem cornerstone species, and widespread plague outbreaks that have dramatically reduced populations in some locations. Prairie dog colonies are located within the study area and edges of their colonies cross into the selected alignment in several locations. Permits from the Colorado Division of Wildlife (CDOW) are required to relocate or eradicate prairie dogs. Boulder County makes efforts to relocate prairie dogs when practical; Northern Water will follow Boulder County guidelines in its management of prairie dogs where they exist within the selected easement.

Cylindrical Papershell

The cylindrical papershell (*Anodontoides ferussacianus*) is a medium sized freshwater mussel found in muddy or sandy bottoms of lakes and quiet streams. The papershell is a species of special concern in Colorado. It has been observed in freshwater sources in the Hygene, Niwot, and Longmont quads in Boulder County, and is predicted to occur in the St. Vrain River outside of the selected alignment. However, the last recorded observations of this species occurred in 1977. BMPs will be applied to river and stream crossings to minimize any potential impacts to this mollusk or its habitat in case it is still present.

Minimization measures described for the brassy minnow will be used to minimize impacts to the cylindrical papershell. Additionally, surface alluvium and sediments excavated from within the stream will be replaced in the same order in which they are removed, preserving sediment horizons. If cylindrical papershell are found during construction, excavated alluvium will be kept moist while stockpiled, until material is placed back to post construction elevations.

Northern Leopard Frog

The Northern leopard frog, a state species of special concern, is found in both mountains and plains habitats throughout central and western Colorado. They can be locally common, but are rare or extirpated from a majority of the state, particularly in the mountains. They live and breed in and near shallow permanent water, wet meadows, and quiet streams and ditches, and are predicted to occur within the selected alignment in two locations. BMPs will be applied to river and stream crossings and adjacent habitats to minimize any potential impacts to this frog or its habitat. Minimization of the extent of disturbed area will be used when crossing aquatic habitats in order to minimize impacts to the Northern leopard frog.

Additional Sensitive Species

Bell's Twinpod

The Bell's twinpod (*Physaria bellii*) is a former Category 2 candidate plant species. This classification no longer exists; however, surveys were specifically performed for this species in all areas with suitable habitat, including shaley outcrops. One population of Bell's twinpod was located close to the selected route in Larimer County. This population is located near the end of Larimer County Road 6 and is outside of the proposed easement. No Bell's twinpod were found within the selected route easement in Boulder County.

Migratory Birds

All migratory birds, including raptors, are protected under the Migratory Bird Treaty Act (MBTA) of 1918, which prohibits the taking of migratory birds, eggs, and nests. The Act states:

> *Establishment of a Federal prohibition, unless permitted by regulations, to "pursue, hunt, take, capture, kill, attempt to take, capture or kill, possess,offer for sale, sell, offer to purchase, purchase, deliver for shipment, ship,cause to be shipped, deliver for transportation, transport, cause to be transported, carry, or cause to be carried by any means whatever, receive for shipment, transportation or carriage, or export, at any time, or in any manner, any migratory bird, included in the terms of this Convention . . . for the protection of migratory birds . . . or any part, nest, or egg of any such bird."* (16 U.S.C. 703)

A number of raptor nests are located in proximity to the selected alignment. Nesting raptors can be sensitive to nearby activity or disturbances. The CDOW has developed guidelines for seasonal buffers to prevent the disruption of nesting activities. These seasonal avoidance buffers will be used to schedule construction activities. For example, red-tailed hawk nests should be avoided within a 1/3-mile radius of the nest site between February 15 and July 15. Prior to construction, all raptor nests and roost locations will be reviewed with CDOW to discuss their recommendation for each specific situation. Raptor nests identified near the proposed pipeline alignment are identified on Reference Maps I-P in Appendix IV. Pre-construction surveys will be performed for all spring through fall construction activities to identify locally breeding migratory passerines and waterfowl within and immediately adjacent to the selected route. Locations where active breeding is observed (nest-building, mating behavior, incubation, presence of fledglings), will not be disturbed by construction activities. In compliance with MBTA, no active nests will be directly disturbed by the project. Most bird

species are protected under this act with the exception of nonnative species such as European starlings and house sparrows. A full list of species protected by this Act can be found at http://www.fws.gov/migratorybirds/RegulationsPolicies/mbta/mbtandx.html .

In addition, prairie dog colonies, which provide nesting habitat for the burrowing owl, have been identified along the proposed route and are identified on Reference Maps I-P in Appendix IV. Burrowing owls are sensitive to human encroachment and should be avoided within 75 yards of the colony site from April 1 through August 15. Construction through prairie dog colonies will be performed between November 1 and March 1, unless focused surveys for burrowing owls can demonstrate that this species is not present. Prior to construction, affected prairie dog colonies will be relocated consistent with County and City of Boulder requirements.

Wildlife and Fisheries

The primary riparian corridors that are crossed by the selected route, such as the Little Thompson River, St. Vrain River, and Left Hand Creek, provide essential habitat for fish and wildlife. These riparian corridors provide cover and feeding opportunities for many terrestrial species, breeding habitat for birds, and aquatic habitat for fish. In addition, riparian corridors provide important migration corridors for larger mammals such as muledeer (*Odocoileus hemionius*), black bear (*Ursus americanus*), and mountain lion (*Felis concolor*). These migration corridors are especially important in areas where the foothills transition to the eastern plains. No long-term disruption to these important habitats is anticipated.

The Boulder County data indicates there are critical wildlife habitats along these drainages. The CDOW data identifies specific wildlife habitat, including bald eagle roost and winter concentration areas, Potential and occupied PMJM habitat, and snow goose production area (Reference Maps I-P in Appendix IV.). Although these identified areas are seasonally sensitive, temporary disturbance associated with construction can be scheduled during non-sensitive periods. In addition, snow geese nest only in the arctic; this designated production area is likely a winter concentration area and may be the result of a map labeling error. The bald eagle roost identified at St. Vrain River is within the vicinity of the SWSP II alignment and seasonal buffers recommended by the CDOW will be followed for construction activities. These recommendations include avoiding activities within ¼ mile of roost areas between November 15 and March 15. Once the pipeline is constructed and restored, there is not expected to be any long-term effect on wildlife.

Terrestrial and Aquatic Plant Life

The USGS GIS data set indicates three plant communities within the study area, including forested, grassland, and natural herbaceous. The CDOW riparian habitat data set shows five vegetation types, including forested, riparian shrub, willow, riparian herbaceous, and open water. The Boulder County GIS data set identifies one area as Great Plains Salt Meadow. In addition to the wetland and riparian plant communities described above, mixed grassland and shrubland are also prevalent throughout the selected route. The CNHP also tracks the occurrences of rare or potentially-imperiled vegetation communities (see Table 13).

Mixed Grassland

The upland grassland that exists along the selected route consists of a mixture of native and weed plant species. The plant community is dominated by western wheatgrass (*Pascopyrum smithii*), smooth brome (*Bromus inermis*), Kentucky bluegrass (*Poa secunda*), sideoats grama (*Bouteloua curtipendula*), crested wheatgrass (*Agropyrum cristatum*), and cheatgrass (*Bromus tectorum*). Some of the forbs include field horsetail (*Equisetum arvense*), chicory (*Cichorium intybus*), alfalfa (*Medicago sativa*), lambs quarters (*Chenopodium album*), showy milkweed (*Asclepias speciosa*), kochia (*Kochia scoparia*), scarlet globe mallow (*Sphaeralcea coccinea*), horseweed (*Conyza canadensis*), asparagus (*Asparagus officinalis*), wild licorice (*Glycyrrhiza lepidota*), salsify (*Tragopogon dubius*), mullein (*Verbascum thapsus*), smooth

groundcherry (*Physalis virginiana*), and western tansy mustard (*Descurainia pinnata*). Although mixed grassland will be temporarily affected, no long-term impacts are expected as a result of this project. Impacts to mixed grassland will be reclaimed with similar species composition.

Shrubland

Several areas of shrubland exist along the northern portion of the alignment. The shrubland is dominated by species such as rubber rabbitbrush (*Chysothamnus nauseosus*), fringed sagebrush (*Artemisia frigida*), winterfat (*Krascheninnikovia lanata*), yucca (*Yucca glauca*), and broom snakeweed (*Gutierrezia sarothrae*). Grasses include western wheatgrass (*Pascopyrum smithii*) and blue grama (*Bouteloua gracilis*). Shrubland will be temporarily affected during construction. Following reclamation of shrubland, no long-term impact to this community will result.

Great Plains Salt Meadow

Boulder County identifies a Great Plains Salt Meadow at a location near Lagerman Reservoir. Although the data shows a polygon of Great Plains salt meadow north of Pike Road (east side of North 75th Street, on opposite side of street as pipeline), there is an area along Dry Creek, downstream of Lagerman Reservoir, with similar characteristics. This area is a saline wet meadow that is saturated to the surface. The vegetation at this location is dominated by inland saltgrass (*Distichlis stricta*), common spikerush (*Eleocharis palustris*), and includes annual rabbitsfoot grass (*Polypogon monspeliensis*), alkali sacaton (*Sporobolus airoides*), arctic rush (*Juncus arcticus*), salt sandspurry (*Spergularia marina*), common threesquare (*Schoenoplectus pungens*), and jointleaf rush (*Juncus articulatus*). No long-term impacts to salt meadow will result from construction. Impacts will be temporary in nature and salt meadow habitat will be reclaimed following construction. Photograph 7 shows the Great Plains Salt Meadow.

Photograph 7. Great Plains Salt Meadow located along Dry Creek downstream of Lagerman Reservoir

Forested Riparian

Most of the mature trees will be avoided by the selected route. One area that is heavily congested with mature trees is Left Hand Creek. However, at the selected crossing, there is a small opening that can be used for pipeline construction, which will avoid the removal of trees. Some trees may need to be trimmed to avoid damage to the trees. Photograph 8 shows the alignment at Left Hand Creek.

Photograph 8. The pipeline route at Left Hand Creek

Noxious Weeds

Weeds listed in the Colorado Noxious Weeds Act are common along the pipeline alignment. There are several large patches of Russian olive found along the alignment, such as at IBM and near the Left Hand Creek crossing. No other large patches of noxious weeds were identified and no noxious weeds from the Colorado Noxious Weeds List A were observed during the field surveys. The following Colorado Noxious Weeds from Lists B and C, some of which are also listed as Boulder County noxious weeds (Appendix V), were observed sporadically within the selected route:

List B

- Canada thistle (*Cirsium arvense*)
- Common teasel (*Dipsacus fullonum*)
- Dalmatian toadflax, narrow-leaved (*Linaria genistifolia*)
- Diffuse knapweed (*Centaurea diffusa*)
- Leafy spurge (*Euphorbia esula*)
- Russian-olive (*Elaeagnus angustifolia*)

List C

- Chicory (*Cichorium intybus*)
- Common mullein (*Verbascum thapsus*)
- Downy brome (*Bromus tectorum*)

- Field bindweed (*Convolvulus arvensis*)
- Perennial sowthistle (*Sonchus arvensis*)

To avoid the spread of these noxious weeds, topsoil will be salvaged and stockpiled separately from subsoil and other materials to prevent the spread of noxious weed seed. To do this, areas containing noxious weeds will be identified and delineated at the start of construction and avoided. Noxious weeds will be controlled with herbicide, and weed infested soil will not be mixed with topsoil and other soils. If noxious weeds, such as Russian olive, are encountered within the construction right-of-way, they will be eradicated, pending property owner permission[5]. Following construction, restoration activities will occur and maintenance to treat any noxious weeds will occur until native vegetation is established. A full list of Boulder County noxious weeds can be found at http://www.bouldercounty.org/find/library/environment/weedlist.pdf .

Air Quality

The SWSP II will not result in any long-term changes to air quality. Construction of the project will result in short-term emission exhaust from construction traffic and traffic delays. The short-term effects will be minimized by using standard contract requirements concerning vehicle idling and by minimizing traffic delays.

The contractor will be responsible for developing and implementing a fugitive dust control plan. The plan will be submitted and approved by the Boulder County Health Department and Colorado Division of Public Health and Environment prior to construction[6].

The City of Boulder may install a hydroelectric generator on the end of the Boulder Reservoir WTP. This renewable source of electricity could potentially offset some emissions produced at a fossil fuel burning plant. At this time, the inclusion of a hydroelectric generator has not been determined. Further details will be available if hydroelectric generation is included during the final design.

Significant Environmentally-Sensitive Factors

Potential Natural Hazards

The 100-year floodplain crossed by the pipeline at the Little Thompson River, St. Vrain River, Dry Creek No. 1, Left Hand Creek, and Dry Creek No. 2 are the only potential natural hazards in the area. These natural hazards will not be affected by construction of the SWSP II because of the nature of the project. The buried pipeline will not change the floodplain and the pre-construction grades will be restored.

Public Outdoor Recreation and Open Space Areas

One property at the Boulder Reservoir is used for public outdoor recreation. There will be no recreation closures during construction.

Unique Areas of Geologic, Historic, and Archaeological Importance

Cultural and historic resources information was obtained from a file search of the State Historical Preservation Office (SHPO) and a review of known cultural resources by Peter Gleichman of Native Cultural Services. The file search for the entire project alignment

[5] With the property owner's permission, all Russian olive trees within the easement will be cut and stump treated with herbicide and will be monitored as part of the restoration monitoring.

[6] The Land Development APEN/Dust Control Plan can be found at: http://www.cdphe.state.co.us/ap/downpermitforms/ APENLandDevelopment.pdf
Regulations Numbers 1 & 3 can be found at: www.cdphe.state.co.us/regulations/airregs
Colorado Air Quality Control Commission's Regulation No. 3 will be complied with for non-attainment areas and appropriate controls will be used.

revealed one prehistoric resource (isolated artifact) within the study area; however, isolated artifacts are not eligible for listing on the National Register of Historic Places (NRHP). The file search also revealed 17 historic resources, including irrigation ditches, railroads, and standing buildings. The pipeline route does not adversely affect any known cultural resources. All of the eligible buildings will be avoided. The alignment will cross the Clover Basin Ditch; not enough data was available in the records search to determine if it is eligible. In order to comply with Section 106 of the Historical Preservation Act, a field determination of the status of this ditch is needed before a 404 permit can be obtained. If necessary, the pipeline can be engineered and constructed without impact to the ditch.

The SHPO files list the Boulder and Left Hand Railroad as occurring in the project vicinity and eligible for listing on the NRHP. However, Peter Gleichman, who performed the literature review, believes this information is erroneous and the Boulder and Left Hand Railroad may have been confused with the Middle Park and Pacific Railroad.

Given the potential for undocumented cultural resources to occur, a field survey of the alignment will be performed once the easement is acquired. Adverse effects to significant cultural properties from pipeline construction will be avoided or mitigated.

The SWSP II will follow the cultural mitigation measures identified in the Environmental Committments (Appendix I). A Class III resource inventory of the right-of-way will be conducted. Identified cultural resources within the right-of-way will be avoided to the extent practical. If avoidance is not possible, SHPO will be consulted regarding eligibility of the subject sites for inclusion in the NRHP. Cultural resources reporting will include site forms and the results of archaeological testing.

These mitigation measures include having a paleontologist present during trench excavation in geologic formations with a potential to contain significant fossils. If significant fossils are found, construction will be rescheduled to allow for resources recovery or the trench will be realigned. If fossils are noticed elsewhere, a paleontologist will be consulted.

Visual Aesthetics and Nuisance Factors

The selected SWSP II route is visible from a number of public roads. The construction will temporarily disturb the existing vegetation and associated land use. A restoration plan using native species will be developed for impacts to native habitats once the easement is acquired and final design is underway. Reclamation plans will also be developed for hay pastures. Grades will be restored to pre-construction conditions and any surficial irrigation will be graded to restore function. If post-construction soil settling occurs, additional correction will be made. Examples of the level of restoration can be seen at the original SWSP alignment, which is difficult to locate except for the pipeline markers (Photograph 9).

Photograph 5**. Habitat previously impacted by original SWSP and restored to native conditions. Pipeline marker located at the top of the hill, with little other evidence of the pipeline through this area.**

Potential temporary disturbances:

- Construction will result in temporary construction noise. Construction practices will comply with the following conditions to minimize noise disruptions.

- Construction shall not exceed 82 dB (average) from the nearest residence during the hours of 7:00 a.m. and 7:00 p.m. for work of any type, and shall not exceed 75 dB (average) all other times. Boulder County can monitor this noise standard and grant variances, if determined to be necessary.

- Sound from any moving vehicle source associated with the project shall not exceed 82 dB (A) at any time. Mufflers on equipment will be rated to fall below this level.

- In cultivated fields, construction will occur to minimize the amount of time the field is out of production. Agricultural lands will be avoided from March 1 to October 1 to the maximum extent practical. However, any loss of crop production or crop damages will be compensated by Northern Water.

- Construction can attract public curiosity and create a safety hazard for both workers and the public. Signing, fencing, and traffic control will be used to limit risk to the public and workers. A health and safety plan will be created and implemented during

construction to further enhance public and worker safety. Emergency responders will be notified of the project, and regular progress updates will be reported to ensure first responders know the current location of workers.

Transportation Impacts

During construction of the pipeline, temporary delays or detours may affect traffic patterns on roadways along, or crossed by the alignment. The majority of roads within the study area are under the jurisdiction of Boulder County, and are typically two-lane with asphalt surfacing. The county typically requires that existing paved roadways be crossed by bore and jack methods, perpendicular to the roadway, unless overriding circumstances render this method infeasible. Major highways within the study area include State Highways 66, 287, 119, and 52. The Colorado Department of Transportation also typically requires that state highways be crossed by bore and jack methods perpendicular to the roadway. This type of crossing roadways will create minor impacts. Routes that parallel roadways are assumed to be constructed in a separate pipeline easement unless constraints require construction in a road right-of-way or in the roadway. Construction in active travel lanes could create major impacts to transportation and will be avoided to the extent practical.

One lane of traffic will be maintained at all times and residential and emergency access will be provided at all times to adjacent properties. Traffic closures may require altering one-way traffic flow and the use of flagmen. Under normal traffic volume patterns, only several minutes of delay would be expected. During nonworking hours, steel plates will be installed to allow traffic to flow freely in both directions.

Road crossings will be completed during the spring and summer months so that any necessary road repaving can be completed as quickly as possible. Working hours may be altered to avoid peak traffic periods. Following the completion of the pipeline, street repaving will take approximately one day to complete at each location.

Prior to the commencement of construction activities, a pre-construction meeting will be held with the contractor and agency representatives to set forth the hours of work, access points, snow removal in the construction zone, traffic management and traffic control, and construction and inspection schedules.

Open Space

The SWSP II alignment crosses multiple open space properties. Given the success of the open space programs in Boulder County, avoiding any crossings of these areas was not possible. Open space properties are summarized in Table 16. From an overall distance perspective, the majority of these crossings occur through areas that are under active cultivation. Construction through these areas will be conducted in a manner that minimizes disruptions to agricultural activities, and all disturbed areas will be carefully restored to original condition in terms of soil profile and contours.

Natural features within open space properties, such as the St. Vrain River crossing at the Golden/Feldstrom property, are summarized in Appendix V. Disturbance in these areas will be minimized, and the area will be restored to similar conditions prior to the project. The SWSP II project team met with Boulder County Parks on April 20, 2007, and attended a field trip on May 17, 2007, to specific properties to obtain input on some of the concerns regarding the alignment and construction methods. In addition, the SWSP II project team also met with City of Boulder Open Space and Mountain Parks on November 22, 2007, to review project concerns.

Table 16. Open space properties crossed

Property Name	Property Type	Crossing Distance	Alignment	Comments
Tveten	CE	5,400 feet	Adjacent to SWSP	Cultivated/Dryland - Includes Little Thompson crossing (see Appendix V.)
Turner-Taylor Ranch	CE	4,300 feet	Adjacent to SWSP	Dryland
Cushman-Brooks-Toltz	CE	1,400 feet	Adjacent to SWSP	Dryland
Kubel	CE	4,500 feet	Adjacent to SWSP	Cultivated/Dryland
Rough & Ready	CE	1,100 feet	Adjacent to SWSP	Cultivated
Lohr	County-owned	3,000 feet	Adjacent to SWSP	Cultivated
Braggs-Spangler	County-owned	1,500 feet	Adjacent to SWSP	Cultivated
Golden/Feldstrom	County-owned	2,800 feet	Adjacent to SWSP	St. Vrain River crossing (see Appendix V) Cultivated
Suitts	Joint City and County-owned	1,300 feet	New alignment adjacent to North 75th Street	Dryland
Lagerman Reservoir	County-owned	3,500 feet	New alignment adjacent to North 75th Street plus new ROW	Dryland/Salt Meadow (see Appendix V.)
Heil	CE	500 feet	New alignment east of North 73rd Street	Dryland/Cultivated
Alpenglow Acres	CE	1,300 feet	New alignment north of Holland Ditch	Cultivated
Goose Point Ranch	CE	1,300 feet	New alignment north of Holland Ditch	Dryland
Imel	Joint City and County-owned	5,200 feet	New alignment	Cultivated
IBM	Joint City and County-owned	3,600 feet	New alignment	Cultivated
Lynch	CE	1,100 feet	New alignment adjacent to Monarch Road	Cultivated
Boulder Reservoir	City Park and Open Space	2,800 feet	New alignment adjacent to North 63rd Street	Natural
Turner-Taylor Ranch	CE	2,700 feet	Adjacent to SWSP, Fort Lupton/Hudson Phase, along Vermillion Road	Cultivated
Dirk	CE	100 feet	Adjacent to SWSP, Fort Lupton/Hudson Phase, along Vermillion Road	Cultivated

Property Name	Property Type	Crossing Distance	Alignment	Comments
Redrock	CE	2,400 feet	Adjacent to SWSP, Fort Lupton/Hudson Phase, along Vermillion Road	Cultivated
Pasqual	CE	2,600 feet	Adjacent to SWSP, Fort Lupton/Hudson Phase, along Vermillion Road	Cultivated
Puma 66	County-owned	2,600 feet	Adjacent to SWSP, Fort Lupton/Hudson Phase, along Vermillion Road	Cultivated
Wood Meadow	CE	2,500 feet		Cultivated
Barrett	County-owned	2,400 feet	Adjacent to SWSP, Fort Lupton/Hudson Phase, along Vermillion Road	Cultivated
Carlson	County-owned	2,500 feet	Adjacent to SWSP, Fort Lupton/Hudson Phase, along Vermillion Road	Cultivated
Rocky Mountain Fuel 3	County-owned	2,600 feet	Adjacent to SWSP, Fort Lupton/Hudson Phase, along Vermillion Road	Cultivated

Appendices

Appendix I. Environmental Commitments

Environmental Commitments

1. **Special Construction Measures:** In constricted areas, such as between a building and an existing right-of-way, or when crossing or passing particularly sensitive environmental conditions such as wetlands and treebelts, special construction methods will be used. Use of special construction methods narrows the zone of disturbance by using supported, near vertical trench walls and, if necessary, by storing bedding material and excavated material along the right-of-way from the sensitive condition. In wetlands, the U.S. Army Corps of Engineers' guidelines for construction in wetlands will be used. These guidelines require that the area to be disturbed be kept to a minimum, that topsoil be kept separate from subsoil during excavation and backfilled in the correct relationship (i.e., subsoil first, topsoil at the surface), that excess fill be disposed of away from the wetland, and that the wetland plant communities present before construction be reestablished.
2. **Seasonal Restrictions:** Certain potential affected wildlife areas, including heronries, designated critical wildlife habitat, and raptor nests, are more sensitive at certain times of the year, generally late spring/early summer. Construction will not take place in these areas during the most sensitive seasons. This measure effectively eliminates many of the potential impacts to these species at these locations. The only remaining potential impact would be the extremely remote chance of a pipeline failure in the sensitive area at the critical season, which would necessitate potentially disturbing construction activities.

   Construction will occur at major crossings during periods of low flow such as during the winter.

3. **Sedimentation Control:** When the pipeline trench is being excavated in areas of high water table (for example floodplains, wetlands, and riparian areas), the water that accumulates in the trench must be pumped out to allow construction to continue. Rather than discharging the sediment-laden water to an adjacent water body, it will be diverted to specially constructed settling basins and then, after most of the sediment has settled out, diverted to the nearest natural water body or drainage channel. The Corps of Engineers will be consulted prior to any proposed fill that might impact wetlands.
4. **Reclamation/Revegetation of Disturbed Areas:** In all cases, the primary objective in applying reclamation measures is the prevention of soil erosion and the stabilization of slopes and runoff channels. This will be achieved primarily by the establishment (within two growing seasons) of plant cover of a density equal to or greater than that of the original cover adjacent to the specific disturbed area (ultimately consisting, where feasible, of the communities present before disturbance). Where required, areas that were disturbed during project construction will be reclaimed during and soon after construction by site-specific application of the mitigation measures described below. This will be done, when appropriate, in consultation with appropriate governmental agencies and interested private landowners.

potable water lines and sewers. The pipeline will also be constructed to avoid conflicts, where possible, with gas, power, cable TV, telephone lines and related facilities. Any required relocation of existing utilities will be paid for by NCWCD.

7. **Additional Specialized Mitigation Measures:** The mitigation measures outlined above will be applicable along most segments of the pipeline. Various other mitigation measures will be used as necessary for special environmental conditions or circumstances. These additional measures are listed below.
    a. Perform geologic investigations to identify potential landslides/subsidence area.
    b. Stabilize areas of potential mass movement.
    c. Resurvey for sensitive species if determined necessary by USFWS and CDOW.
    d. Relocate any rare plant populations identified.
    e. Perform burrowing owl surveys to ensure owls are not present at prairie dog towns if construction will be performed between March 1 and November 1.

8. **Cultural:** NCWCD will determine if any portion of the route is located in historical or archeological resource areas of statewide importance. Where development will take place in such areas, NCWCD will submit to the Board:
    a. A state historical site survey form completed by a qualified professional acceptable to the State Historical Preservation Officer for all resources affected by the project; and
    b. Plans and procedures for notification to the State Historical Society and State Archaeologist upon discovery of historical or archaeological resources.

    In such areas, development will be:
    a. Designed to preserve the integrity of the resource; and
    b. Conducted in a manner which will be compatible with the preservation of the resource and minimize damage to the resource.

9. **Specific Siting of Project Elements:** The 1041 Submittal and Feasibility Study were based on available published, mapped information, and supplemented by field checking. Prior to construction of the selected route, specific site conditions at environmentally sensitive areas will be examined to identify opportunities for reducing impacts by minor route adjustments within the defined corridor.

10. **Wildlife:** Prior to any construction that may occur during the breeding seasons, segments will be surveyed for any nesting birds that may be covered under the Migratory Bird Treaty Act. All active nests will be avoided and CDOW and USFWS will be consulted to minimize impacts to adjacent nesting activity.

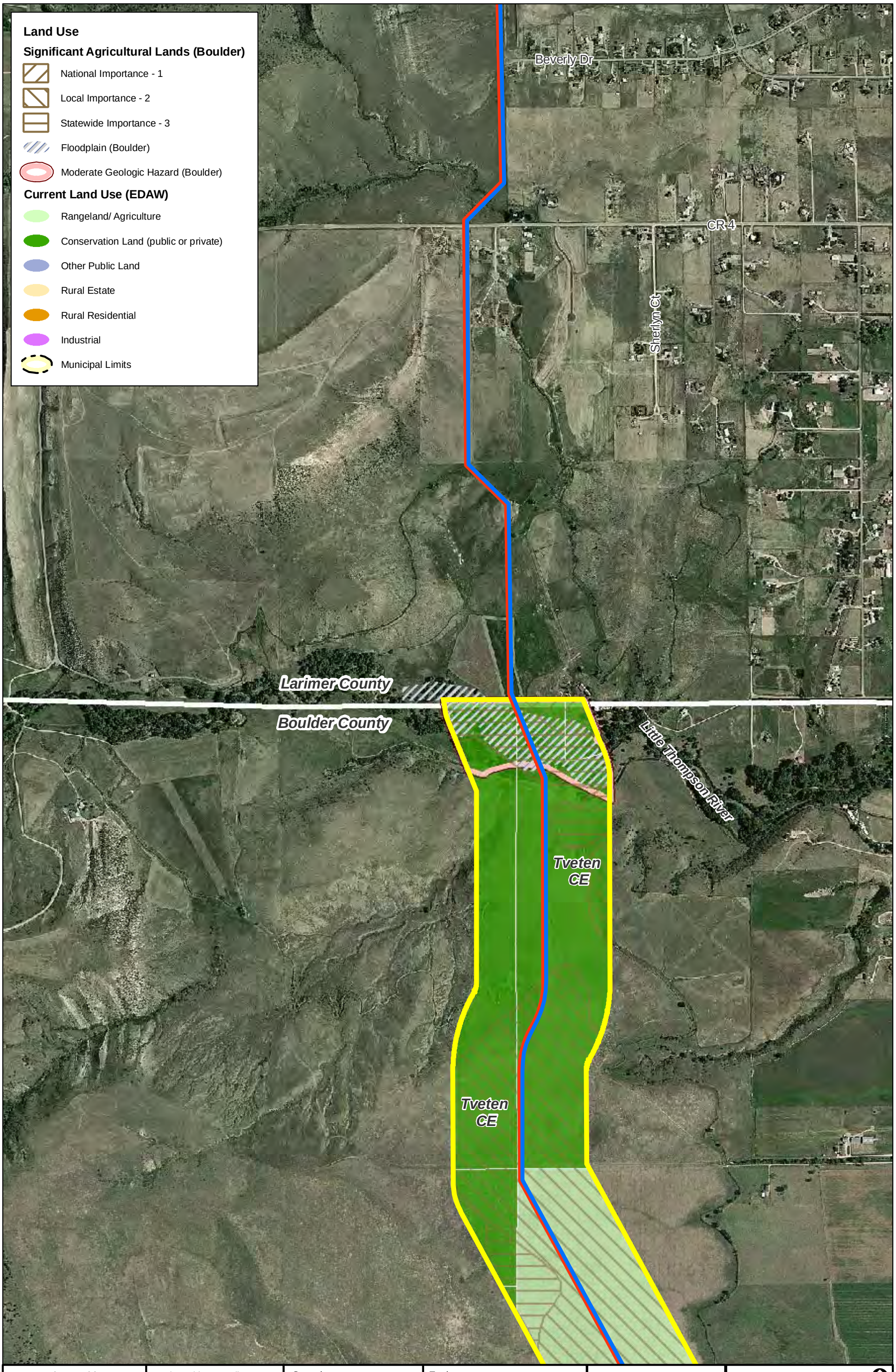
11. **Environmental Monitor:** Northern Water will fund an environmental monitor to monitor the construction of the project to ensure that all of the environmental commitments are being met.

a. ***Topsoil Removal and Storage:*** In appropriate areas (i.e., those areas with a significant topsoil horizon), topsoil will be stripped, stockpiled separate from other excavated material, and used for revegetation.
b. ***Replacemnt and disposal of Excavated Material:*** After installation of the pipeline and bedding material in the trench, excavated soil will be replaced in its original relationship to the surface, i.e., subsoil below, topsoil at the surface. All topsoil will be replaced, and any surplus subsoil will be removed and disposed of properly.
c. ***Regrading of Disturbed Areas:*** After construction, areas disturbed by construction operations will be graded, shaped, and smoothed to contours close to the original, or (if this is not feasible) to natural-appearing contours. In all cases, cut and fill slopes will be designed to be revegetated and stable when plant cover is established.
d. ***Stabilization of Slopes and Banks:*** Steep areas crossed by the pipeline, including the banks of streams and drainage channels will be stabilized after construction. If necessary, mulch, fabric, netting, or appropriate application of riprap will be used to achieve stability.
e. ***Seeding:*** All previously vegetated areas disturbed by project construction will be reseeded. Seeding will normally be with suitable and appropriate grass mixes. Where necessary, these will consist of native, pasture, or other species adapted to local soil and water conditions. Steep areas or other areas where soil erosion might be difficult to control will be fertilized and mulched if warranted. If necessary, in severe cases, fabrics or netting will be used.
f. ***Landscaped Areas:*** NCWCD will pay compensation for or will replace, landscape plantings (trees, shrubs, ground covers, lawns) and built features (terraces, paved areas, parking lots, fences, gates, minor structures, etc.) which required removal to allow pipeline construction.
g. **Cultivated Land:** NCWCD will pay compensation for crops destroyed, damaged, of foregone because of construction. On cultivated lands, deep ruts and scars caused during construction that might be hazardous to farming operations will be leveled, filled and graded, or otherwise eliminated. Areas of compacted or hard-packed soil will have the soil decompacted. Damage to ditches, terraces, tile drains, roads, or other features of agricultural land will be corrected. The land and facilities will be restored as nearly as practicable to original condition.
h. **Screening Planting:** Where necessary to screen surface facilities associated with SWSP II, or to help areas of disturbance blend into a surrounding natural environment, shrub plantings will be established.
i. **Cleanup of Construction Materials:** All waste construction materials and debris from all construction areas will be collected, hauled away and disposed of at approved sites.

5. **Right-of-Way:** Landowners will be paid just compensation for the rights acquired.
6. **Other Utilities:** Other underground utilities will often be encountered, particularly at highway/roadway crossings. Excavations will be designed to avoid, where possible,

Appendix II. Siting Report (electronic version)

Appendix III. Land Use Map A Through H



Map Number & Title:	Project Title & Applicant:	Consultant:	Engineer:	Preparation Date: 10/22/08
Map: A **Larimer County Line Segment**	Southern Water Supply Project II NCWCD 220 Water Ave. Berthoud, CO 80513 (970) 532-7700	EDAW|AECOM 240 East Mountain Ave. Fort Collins, CO 80524 (970) 484-6073	Integra Engineering 1095 South Monaco Parkway Denver, Colorado 80224 (303) 825-1802	Revision Date 1: Revision Date 2: Revision Date 3:

Land Use

Significant Agricultural Lands (Boulder)

- National Importance - 1
- Local Importance - 2
- Statewide Importance - 3
- Floodplain (Boulder)
- Moderate Geologic Hazard (Boulder)

Current Land Use (EDAW)

- Rangeland/ Agriculture
- Conservation Land (public or private)
- Other Public Land
- Rural Estate
- Rural Residential
- Industrial
- Municipal Limits

Woodland Rd

County CE
Turner-Taylor Ranch

County CE
Cushman

75th St

Table Top Mountain

Private

County CE
Cushman

County CE
Turner-Taylor Ranch

Journey Ln

County CE
Kugel

Private

County CE
Kugel

County CE
Rough &
Ready

SH 66

County
Lohr
Open Space

County
66 Investments
Open Space

Map Number & Title:	Project Title & Applicant:	Consultant:	Engineer:	Preparation Date: 1/20/2011
Map: B **Table Top Mountain Segment**	Southern Water Supply Project II NCWCD 220 Water Ave. Berthoud, CO 80513 (970) 532-7700	AECOM 240 East Mountain Ave. Fort Collins, CO 80524 (970) 484-6073	Dewberry-Integra Engineering 1095 South Monaco Parkway Denver, Colorado 80224 (303) 825-1802	Revision Date 1: Revision Date 2: Revision Date 3:

Selected Pipeline Alignment
Existing SWSP Pipeline
Study Area (750 ft Buffer)

0 250 500 1,000 Feet

1:12,000

Land Use

Significant Agricultural Lands (Boulder)

- National Importance - 1
- Local Importance - 2
- Statewide Importance - 3
- Floodplain (Boulder)
- Moderate Geologic Hazard (Boulder)

Current Land Use (EDAW)

- Rangeland/ Agriculture
- Conservation Land (public or private)
- Other Public Land
- Rural Estate
- Rural Residential
- Industrial
- Municipal Limits

County CE Lohr

County Braggs/Spangler Open Space

Mcintosh Lake

Hygiene

Hygiene Rd

County CE Treece

Longmont

N 75th St

County Golden/Fedstrom Open Space

County Zweck Open Space

St Vrain Creek

St. Vrain Creek PCA

St Vrain Rd

Longmont Municipal Airport

County CE Coyote Ridge

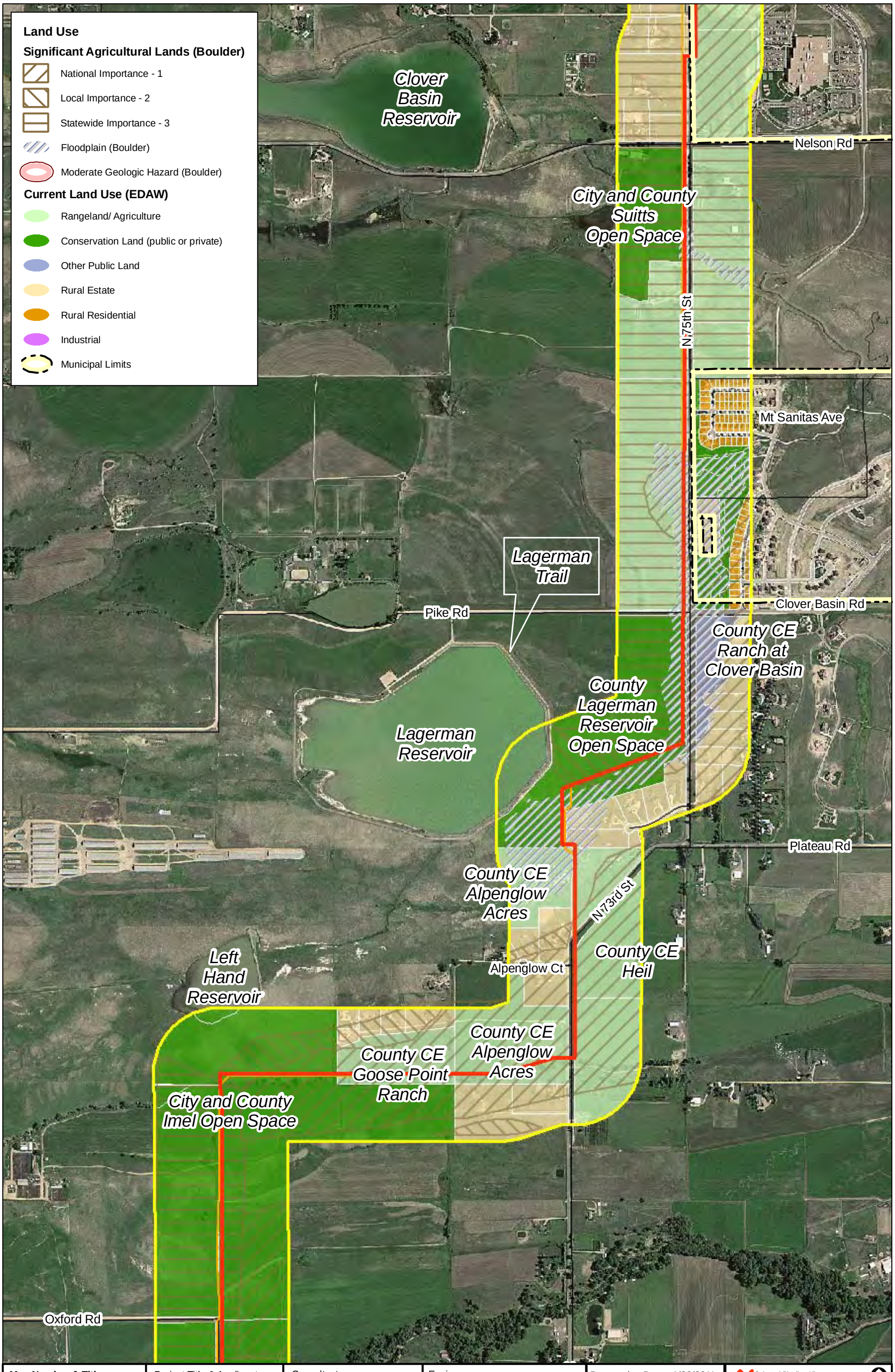
County CE Carpenter

Map Number & Title:	Project Title & Applicant:	Consultant:	Engineer:	Preparation Date: 1/20/2011
Map: C **West Side Longmont Segment**	Southern Water Supply Project II NCWCD 220 Water Ave. Berthoud, CO 80513 (970) 532-7700	AECOM 240 East Mountain Ave. Fort Collins, CO 80524 (970) 484-6073	Dewberry-Integra Engineering 1095 South Monaco Parkway Denver, Colorado 80224 (303) 825-1802	Revision Date 1: Revision Date 2: Revision Date 3:

Selected Pipeline Alignment
Existing SWSP Pipeline
Previous Pipeline Alignment
Study Area (750 ft Buffer)

0 250 500 1,000 Feet

1:12,000



Map Number & Title:	Project Title & Applicant:	Consultant:	Engineer:	Preparation Date: 1/20/2011	Selected Pipeline Alignment Existing SWSP Pipeline Previous Pipeline Alignment Study Area (750 ft Buffer) 0 250 500 1,000 Feet 1:12,000
Map: D **Lagerman Reservoir Segment**	Southern Water Supply Project II NCWCD 220 Water Ave. Berthoud, CO 80513 (970) 532-7700	AECOM 240 East Mountain Ave. Fort Collins, CO 80524 (970) 484-6073	Dewberry-Integra Engineering 1095 South Monaco Parkway Denver, Colorado 80224 (303) 825-1802	Revision Date 1: Revision Date 2: Revision Date 3:	

Land Use

Significant Agricultural Lands (Boulder)

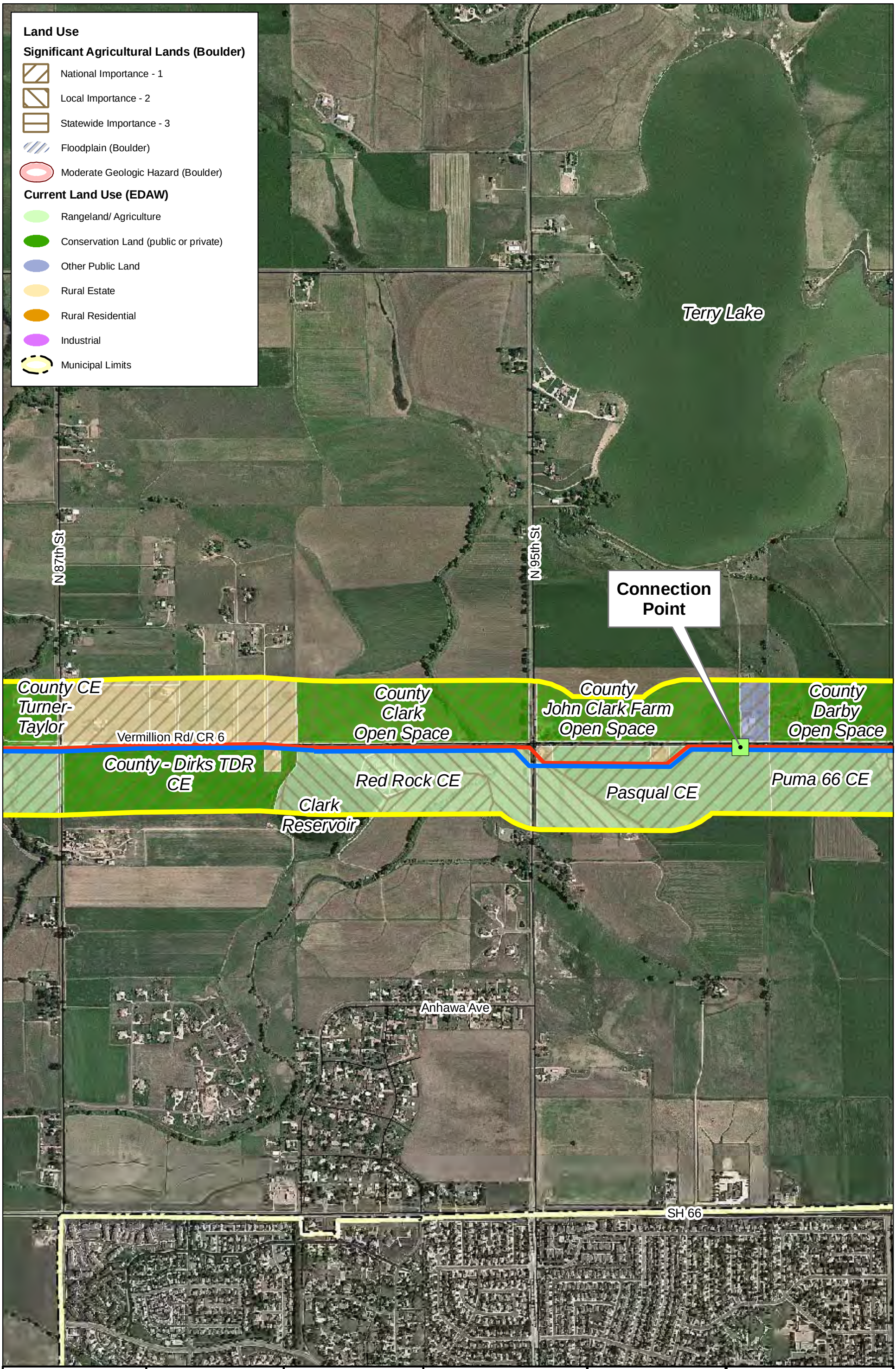
- National Importance - 1
- Local Importance - 2
- Statewide Importance - 3
- Floodplain (Boulder)
- Moderate Geologic Hazard (Boulder)

Current Land Use (EDAW)

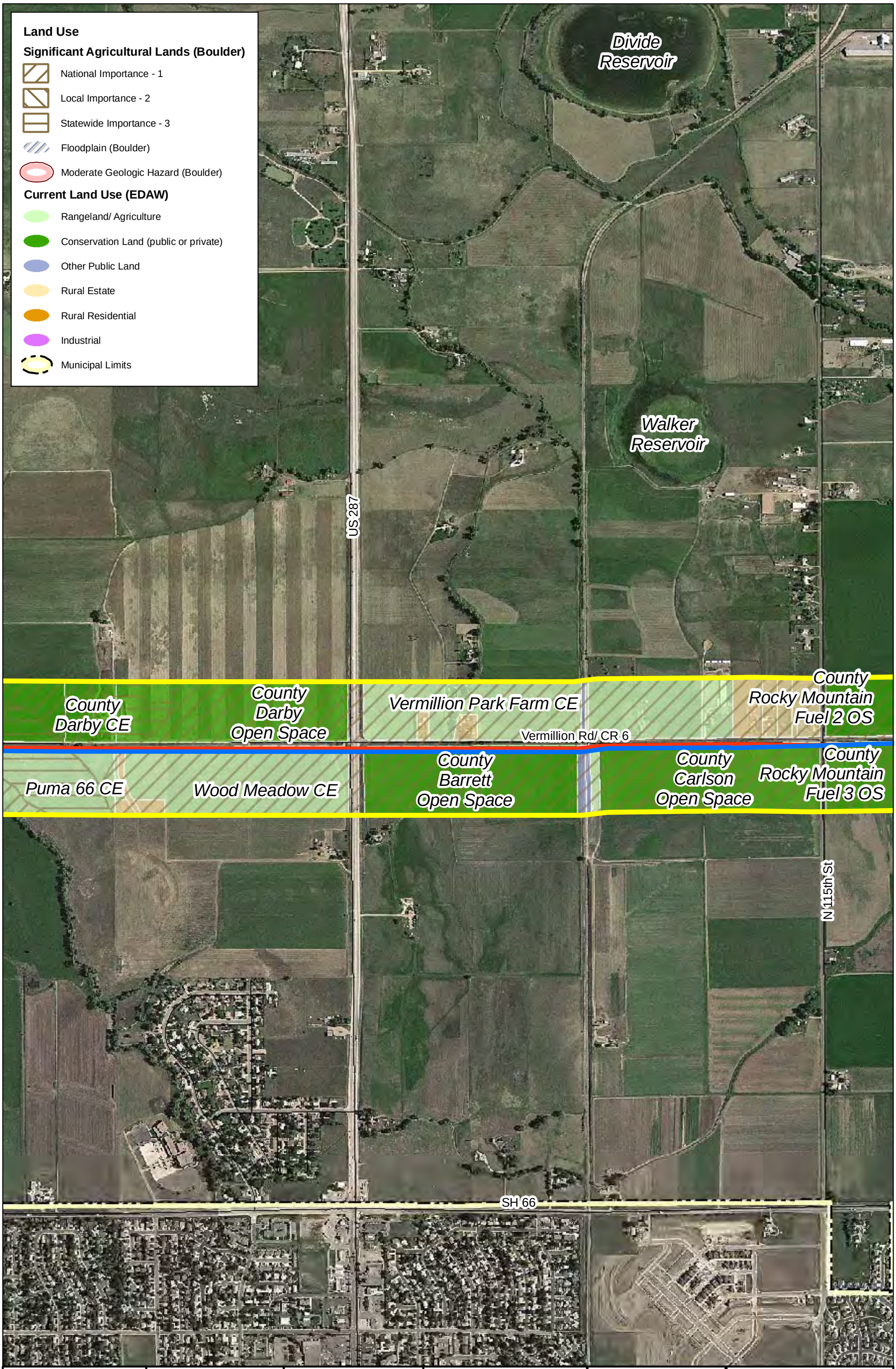
- Rangeland/ Agriculture
- Conservation Land (public or private)
- Other Public Land
- Rural Estate
- Rural Residential
- Industrial
- Municipal Limits

Hygiene Dairy CE
Nimbus Rd
N 63rd St
Left Hand Creek
Connection Point
Bluebird Ave
Brigadoon Ct
Redwing Pl
Misty Way
Strath St
Niwot Rd
City and County IBM Open Space
Lynch CE
Monarch Rd
IBM
E IBM Loop Rd
City of Boulder Axelson Open Space
Park Rd
W Loop Rd
City of Boulder Open Space
IBM Conservation Easement
SH 119
Boulder Reservoir
Connection Point
Winchester Cir
City of Boulder
N 63rd St

Map Number & Title:	Project Title & Applicant:	Consultant:	Engineer:	Preparation Date: 1/20/2011	Selected Pipeline Alignment Existing SWSP Pipeline Previous Pipeline Alignment Study Area (750 ft Buffer)
Map: E **Boulder Reservoir Segment**	Southern Water Supply Project II NCWCD 220 Water Ave. Berthoud, CO 80513 (970) 532-7700	AECOM 240 East Mountain Ave. Fort Collins, CO 80524 (970) 484-6073	Dewberry-Integra Engineering 1095 South Monaco Parkway Denver, Colorado 80224 (303) 825-1802	Revision Date 1: Revision Date 2: Revision Date 3:	0 250 500 1,000 Feet 1:12,000



Map Number & Title:	Project Title & Applicant:	Consultant:	Engineer:	Preparation Date: 1/20/2011	Selected Pipeline Alignment Existing SWSP Pipeline Study Area (750 ft Buffer) 0 250 500 1,000 Feet 1:12,000
Map: F **Terry Lake Segment**	Southern Water Supply Project II NCWCD 220 Water Ave. Berthoud, CO 80513 (970) 532-7700	AECOM 240 East Mountain Ave. Fort Collins, CO 80524 (970) 484-6073	Dewberry-Integra Engineering 1095 South Monaco Parkway Denver, Colorado 80224 (303) 825-1802	Revision Date 1: Revision Date 2: Revision Date 3:	



Map Number & Title:	Project Title & Applicant:	Consultant:	Engineer:	Preparation Date: 1/20/2011	Selected Pipeline Alignment Existing SWSP Pipeline Study Area (750 ft Buffer) 0 250 500 1,000 Feet 1:12,000
Map: G **US 287 Crossing Segment**	Southern Water Supply Project II NCWCD 220 Water Ave. Berthoud, CO 80513 (970) 532-7700	AECOM 240 East Mountain Ave. Fort Collins, CO 80524 (970) 484-6073	Dewberry-Integra Engineering 1095 South Monaco Parkway Denver, Colorado 80224 (303) 825-1802	Revision Date 1: Revision Date 2: Revision Date 3:	

Land Use

Significant Agricultural Lands (Boulder)

- National Importance - 1
- Local Importance - 2
- Statewide Importance - 3
- Floodplain (Boulder)
- Moderate Geologic Hazard (Boulder)

Current Land Use (EDAW)

- Rangeland/ Agriculture
- Conservation Land (public or private)
- Other Public Land
- Rural Estate
- Rural Residential
- Industrial
- Municipal Limits

Boulder County

Weld County

CR 1

Connection Point

A&A CE

Babovec CE

County Rocky Mt. Fuel Open Space

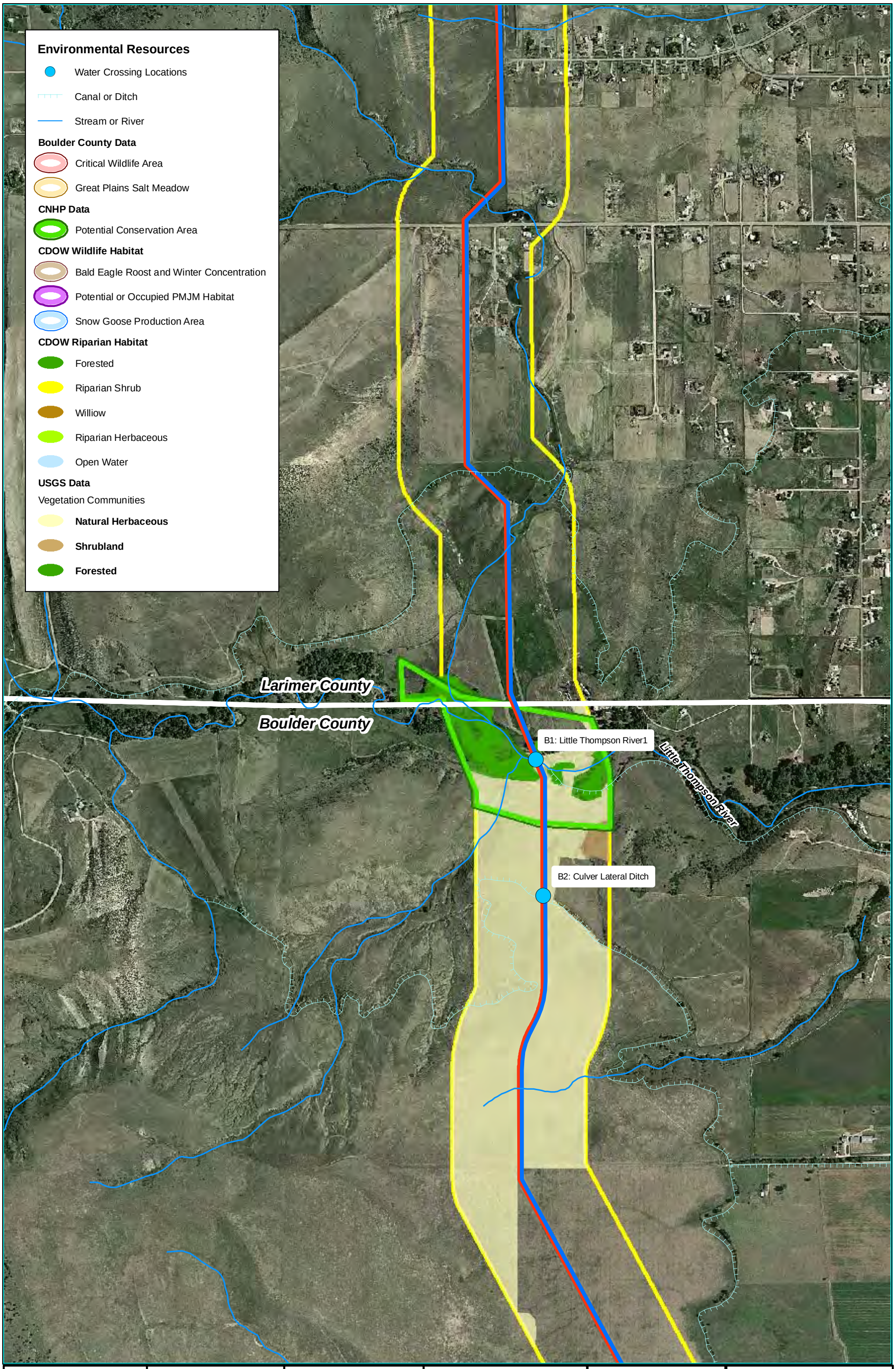
Vermillion Rd/ CR 6

County Rocky Mt. Fuel Open Space

SH 66

Map Number & Title:	Project Title & Applicant:	Consultant:	Engineer:	Preparation Date: 1/20/2011	Selected Pipeline Alignment Existing SWSP Pipeline Study Area (750 ft Buffer)
Map: H **Weld County Segment**	Southern Water Supply Project II NCWCD 220 Water Ave. Berthoud, CO 80513 (970) 532-7700	AECOM 240 East Mountain Ave. Fort Collins, CO 80524 (970) 484-6073	Dewberry-Integra Engineering 1095 South Monaco Parkway Denver, Colorado 80224 (303) 825-1802	Revision Date 1: Revision Date 2: Revision Date 3:	0 250 500 1,000 Feet 1:12,000

Appendix IV. Resource Maps I Through P



Map Number & Title:	Project Title & Applicant:	Consultant:	Engineer:	Preparation Date: 1/20/2011
Map: I **Larimer County Line Segment**	Southern Water Supply Project II NCWCD 220 Water Ave. Berthoud, CO 80513 (970) 532-7700	AECOM 240 East Mountain Ave. Fort Collins, CO 80524 (970) 484-6073	Dewberry-Integra Engineering 1095 South Monaco Parkway Denver, Colorado 80224 (303) 825-1802	Revision Date 1: Revision Date 2: Revision Date 3:

Selected Pipeline Alignment
Existing SWSP Pipeline
Study Area (750Ft Buffer)

0 250 500 1,000 Feet

1:12,000

Environmental Resources

Water Crossing Locations

Boulder County Data

Critical Wildlife Area

Great Plains Salt Meadow

CNHP Data

Potential Conservation Area

CDOW Wildlife Habitat

Bald Eagle Roost and Winter Concentration

Potential or Occupied PMJM Habitat

Snow Goose Production Area

CDOW Riparian Habitat

Forested

Riparian Shrub

Williow

Riparian Herbaceous

Open Water

USGS Data

Vegetation Communities

Natural Herbaceous

Shrubland

Forested

B3: Supply Ditch

B4: Unnamed Drainage

B5: Unnamed Ditch off Supply Ditch

B6: Unnamed Ditch off Supply Ditch

Raptor Nest

Woodland Rd

Table Top Mountain

75th St

Journey Ln

B47: Eisele Lateral Ditch

B7: Highland Ditch

B8: Rough and Ready Ditch

B9: Longmont Supply Ditch

SH 66

B10: Oligarchy Ditch

Map Number & Title:	Project Title & Applicant:	Consultant:	Engineer:	Preparation Date: 1/20/2011
Map: J **Table Top Mountain Segment**	Southern Water Supply Project II NCWCD 220 Water Ave. Berthoud, CO 80513 (970) 532-7700	AECOM 240 East Mountain Ave. Fort Collins, CO 80524 (970) 484-6073	Dewberry-Integra Engineering 1095 South Monaco Parkway Denver, Colorado 80224 (303) 825-1802	Revision Date 1: Revision Date 2: Revision Date 3:

Selected Pipeline Alignment

Existing SWSP Pipeline

Study Area (750Ft Buffer)

0 250 500 1,000 Feet

1:12,000

Environmental Resources

- Water Crossing Locations

Boulder County Data

- Critical Wildlife Area
- Great Plains Salt Meadow

CNHP Data

- Potential Conservation Area

CDOW Wildlife Habitat

- Bald Eagle Roost and Winter Concentration
- Potential or Occupied PMJM Habitat
- Snow Goose Production Area

CDOW Riparian Habitat

- Forested
- Riparian Shrub
- Williow
- Riparian Herbaceous
- Open Water

USGS Data

Vegetation Communities

- **Natural Herbaceous**
- **Shrubland**
- **Forested**

Mcintosh Lake

Hygiene

Hygiene Rd

Longmont

B12: Dennis/Taylor and Mill Ditch

B13: Wet Meadow Wetland

B14: Unnamed Ditch

B15: Zweck and Turner Ditch

N 75th St

St Vrain Creek

B16: St. Vrain

St. Vrain Creek PCA

St Vrain Rd

B17: Niwot Ditch

B18: Wetland

B18-A: Pella Lateral

B19: Davis and Downing Ditch

Longmont Municipal Airport

B20: Clover Basin Ditch

Map Number & Title:	Project Title & Applicant:	Consultant:	Engineer:	Preparation Date: 1/20/2011	Selected Pipeline Alignment Existing SWSP Pipeline Study Area (750Ft Buffer)
Map: K **West Side Longmont Segment**	Southern Water Supply Project II NCWCD 220 Water Ave. Berthoud, CO 80513 (970) 532-7700	AECOM 240 East Mountain Ave. Fort Collins, CO 80524 (970) 484-6073	Dewberry-Integra Engineering 1095 South Monaco Parkway Denver, Colorado 80224 (303) 825-1802	Revision Date 1: Revision Date 2: Revision Date 3:	0 250 500 1,000 Feet 1:12,000

Environmental Resources

Water Crossing Locations

Boulder County Data

Critical Wildlife Area

Great Plains Salt Meadow

CNHP Data

Potential Conservation Area

CDOW Wildlife Habitat

Bald Eagle Roost and Winter Concentration

Potential or Occupied PMJM Habitat

Snow Goose Production Area

CDOW Riparian Habitat

Forested

Riparian Shrub

Williow

Riparian Herbaceous

Open Water

USGS Data

Vegetation Communities

Natural Herbaceous

Shrubland

Forested

B22 - Wet Meadow

B23 - Unnamed Drainage

Clover Basin Reservoir

Nelson Rd

B24 - North Dry Creek (BOCO)

B-25 - James Ditch

B26 - James Ditch

Mt Sanitas Ave

B27 - James Ditch

Clover Basin Rd

Pike Rd

Prairie Dog Colony

B28 - Dry Creek (BOCO)

Prairie Dog Colony

Lagerman Reservoir

Plateau Rd

B29 - Dry Creek (BOCO)

N 73rd St

Alpenglow Ct

Left Hand Reservoir

B31 - Holland Ditch

B30 - Unnamed Ditch

B32 - Unnamed Ditch

B33 - Wet Meadow Wetland

Oxford Rd

Map Number & Title:	Project Title & Applicant:	Consultant:	Engineer:	Preparation Date: 1/20/2011
Map: L Environmental Resources	Southern Water Supply Project II NCWCD 220 Water Ave. Berthoud, CO 80513 (970) 532-7700	AECOM 240 East Mountain Ave. Fort Collins, CO 80524 (970) 484-6073	Dewberry-Integra Engineering 1095 South Monaco Parkway Denver, Colorado 80224 (303) 825-1802	Revision Date 1: Revision Date 2: Revision Date 3:

Selected Pipeline Alignment

Previously Evaluated Alignment

Existing SWSP Pipeline

Study Area (750Ft Buffer)

0 250 500 1,000 Feet

1:12,000

Environmental Resources

- Water Crossing Locations

Boulder County Data

- Critical Wildlife Area
- Great Plains Salt Meadow

CNHP Data

- Potential Conservation Area

CDOW Wildlife Habitat

- Bald Eagle Roost and Winter Concentration
- Potential or Occupied PMJM Habitat
- Snow Goose Production Area

CDOW Riparian Habitat

- Forested
- Riparian Shrub
- Williow
- Riparian Herbaceous
- Open Water

USGS Data

Vegetation Communities

- **Natural Herbaceous**
- **Shrubland**
- **Forested**

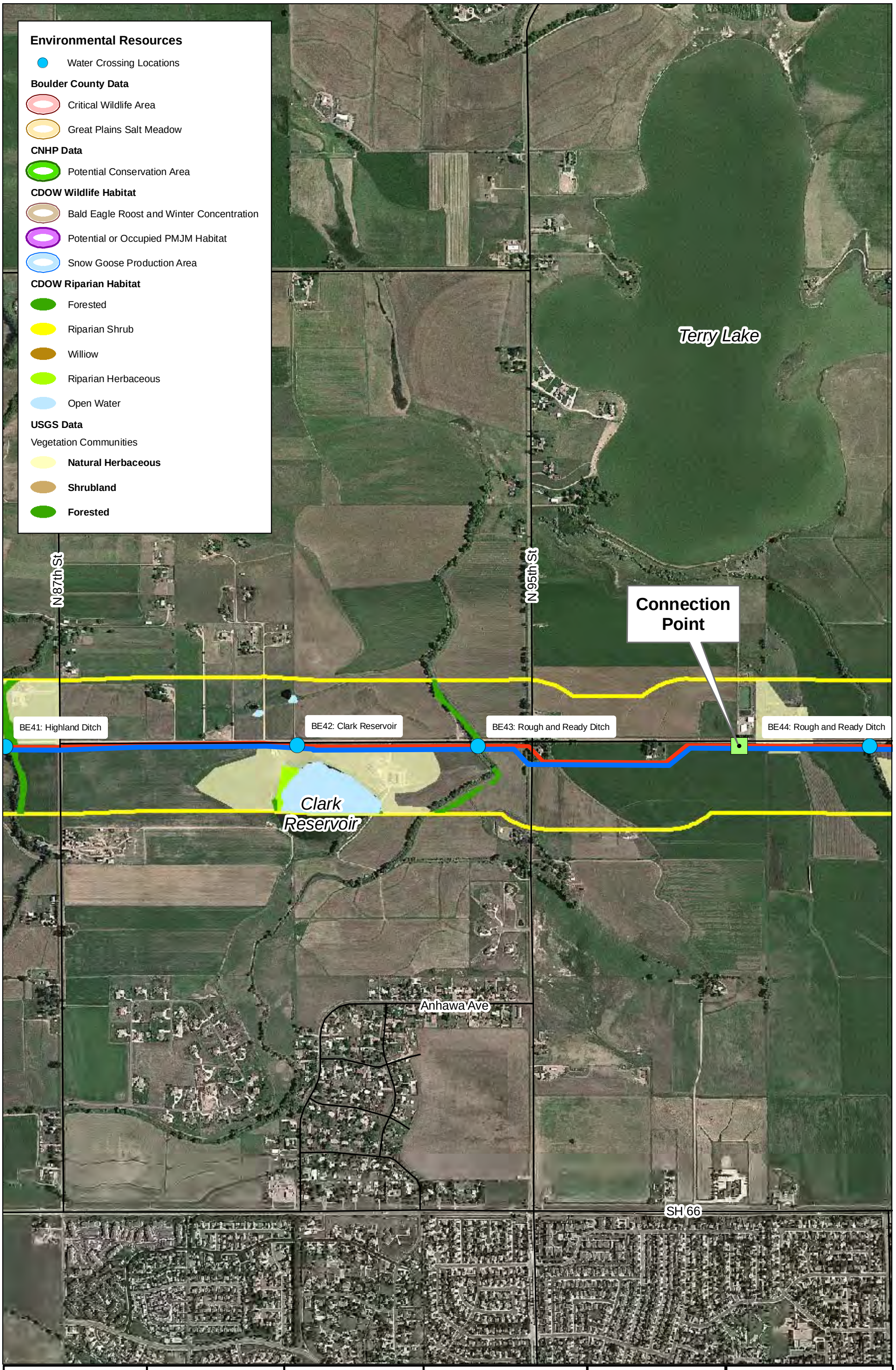
N 63rd St
Nimbus Rd
B34: Left Hand Creek
Left Hand Creek
B35: Williamson Ditch
Connection Point
Brigadoon Ct
Redwing Pl
Misty Way
Niwot Rd
Raptor Nest
B36: Hinman Ditch
B37: Star Ditch
Monarch Rd
Prairie Dog Colony
IBM
E IBM Loop Rd
Park Rd
W Loop Rd
B38: Reservoir Outflow
SH 119
Prairie Dog Colony
B39: Dry Creek
Boulder Reservoir
Connection Point
Winchester Cir
Prairie Dog Colony
B40: Reservoir Outflow
City of Boulder
N 63rd St

Map Number & Title:	Project Title & Applicant:	Consultant:	Engineer:	Preparation Date: 1/20/2011
Map: M **Boulder Reservoir Segment**	Southern Water Supply Project II NCWCD 220 Water Ave. Berthoud, CO 80513 (970) 532-7700	AECOM 240 East Mountain Ave. Fort Collins, CO 80524 (970) 484-6073	Dewberry-Integra Engineering 1095 South Monaco Parkway Denver, Colorado 80224 (303) 825-1802	Revision Date 1: Revision Date 2: Revision Date 3:

Selected Pipeline Alignment
Existing SWSP Pipeline
Study Area (750Ft Buffer)

0 250 500 1,000 Feet

1:12,000



Map Number & Title:	Project Title & Applicant:	Consultant:	Engineer:	Preparation Date: 1/20/2011	Selected Pipeline Alignment Existing SWSP Pipeline Study Area (750Ft Buffer)
Map: N **Terry Lake** **Segment**	Southern Water Supply Project II NCWCD 220 Water Ave. Berthoud, CO 80513 (970) 532-7700	AECOM 240 East Mountain Ave. Fort Collins, CO 80524 (970) 484-6073	Dewberry-Integra Engineering 1095 South Monaco Parkway Denver, Colorado 80224 (303) 825-1802	Revision Date 1: Revision Date 2: Revision Date 3:	0 250 500 1,000 Feet 1:12,000

Environmental Resources

Water Crossing Locations

Boulder County Data

Critical Wildlife Area

Great Plains Salt Meadow

CNHP Data

Potential Conservation Area

CDOW Wildlife Habitat

Bald Eagle Roost and Winter Concentration

Potential or Occupied PMJM Habitat

Snow Goose Production Area

CDOW Riparian Habitat

Forested

Riparian Shrub

Williow

Riparian Herbaceous

Open Water

USGS Data

Vegetation Communities

Natural Herbaceous

Shrubland

Forested

Divide Reservoir

Walker Reservoir

US 287

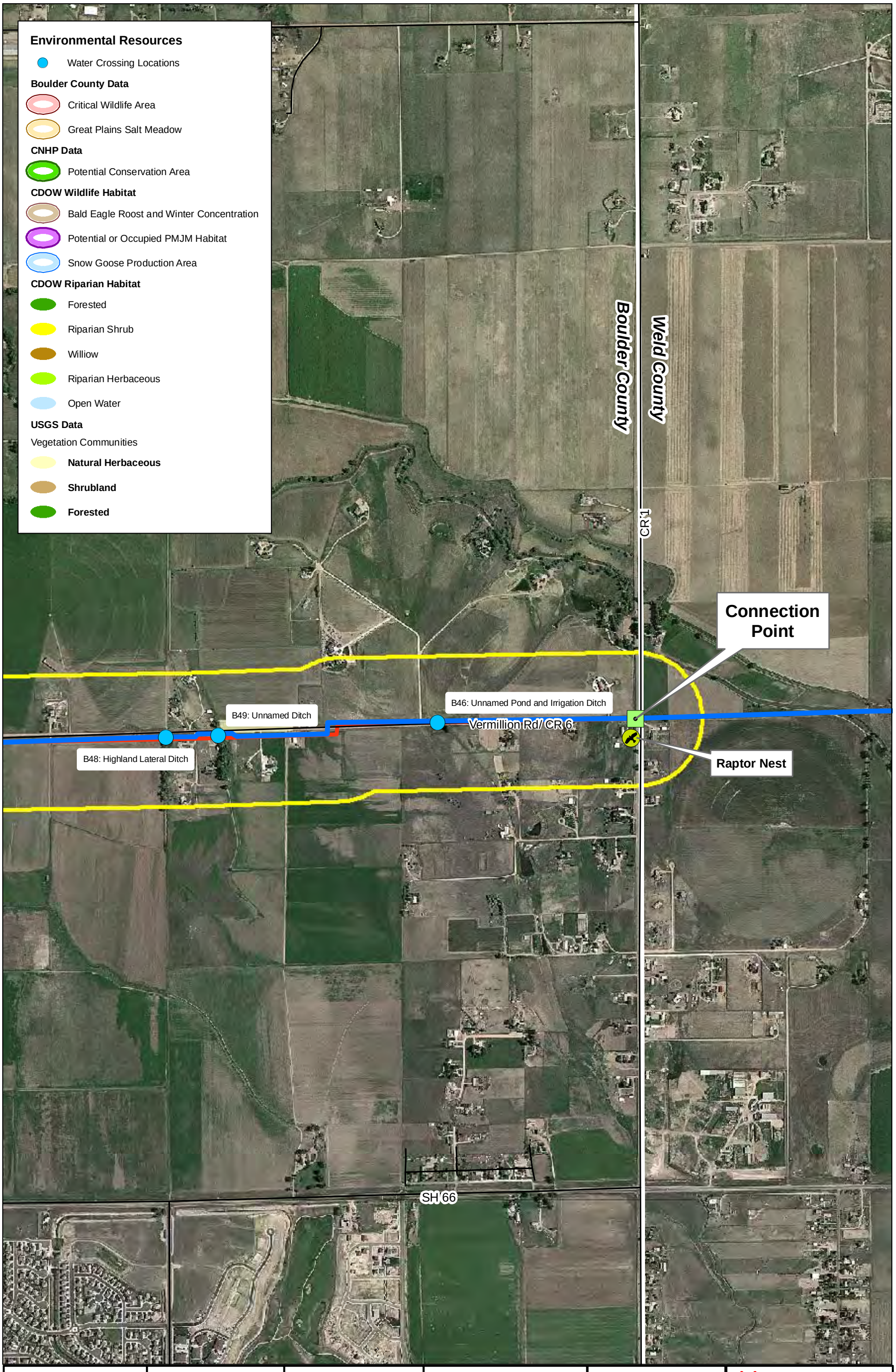
BE45: Unnamed Irrigation Ditch

Vermillion Rd/ CR 6

N 115th St

SH 66

Map Number & Title:	Project Title & Applicant:	Consultant:	Engineer:	Preparation Date: 1/20/2011	Selected Pipeline Alignment Existing SWSP Pipeline Study Area (750Ft Buffer)
Map: O **US 287 Crossing Segment**	Southern Water Supply Project II NCWCD 220 Water Ave. Berthoud, CO 80513 (970) 532-7700	AECOM 240 East Mountain Ave. Fort Collins, CO 80524 (970) 484-6073	Dewberry-Integra Engineering 1095 South Monaco Parkway Denver, Colorado 80224 (303) 825-1802	Revision Date 1: Revision Date 2: Revision Date 3:	0 250 500 1,000 Feet 1:12,000



Map Number & Title:	Project Title & Applicant:	Consultant:	Engineer:	Preparation Date: 1/20/2011	Selected Pipeline Alignment Existing SWSP Pipeline Study Area (750Ft Buffer)
Map: P **Weld County** **Segment**	Southern Water Supply Project II NCWCD 220 Water Ave. Berthoud, CO 80513 (970) 532-7700	AECOM 240 East Mountain Ave. Fort Collins, CO 80524 (970) 484-6073	Dewberry-Integra Engineering 1095 South Monaco Parkway Denver, Colorado 80224 (303) 825-1802	Revision Date 1: Revision Date 2: Revision Date 3:	0 250 500 1,000 Feet 1:12,000

Appendix V. List of Crossings of Wetlands or Waters of the U.S., PMJM Habitat, or ULT Habitat

Description	Crossing Feature No.	Dominant species (abbreviation legend at end of table)	Cover (%)	Comments	Potential for Preble's Habitat	Comments, Recommendations for Trapping	Potential for Ute Ladies'-tresses Orchid Habitat and Occurrence
Little Thompson River	B1	*Populus angustifolia* FACW *Salix exigua* OBL *Carex nebraskensis* OBL *Juncus spp.*			Good Potential Habitat	Negative trapping 2007	Potential habitat None observed
Culver Lateral	B2	*Bromus inermis* FACU* *Phalaris arundinacea* FACW+			No Habitat	Not recommended for trapping	No potential habitat
Supply Ditch	B3	*Phalaris arundinacea* FACW+ *Agrostis stolonifera* FACW *Cirsium arvense* FACU *Solidago canadensis* FACU *Elaeagnus angustifolia* FAC *Juncus arcticus* NI	50 10 5 5 5 10	Riparian area 12 feet wide Small concrete lined ditch 100 feet south of Supply Ditch (appears inactive)	Poor Potential Habitat, no thick shrubby riparian vegetation present	Not recommended for trapping	No potential habitat, steep-sided canal

Description	Crossing Feature No.	Dominant species (abbreviation legend at end of table)	Cover (%)	Comments	Potential for Preble's Habitat	Comments, Recommendations for Trapping	Potential for Ute Ladies'-tresses Orchid Habitat and Occurrence
Unnamed drainage	B4	*Typha latifolia* OBL *Schoenoplectus pungens* OBL	50 30	Riparian area 50 feet wide Standing water in channel	Poor Potential Habitat, no thick shrubby riparian vegetation present	Not recommended for trapping	Potential habitat, grazed area None observed
Unnamed ditch off Supply Ditch	B5	*Carex emoryi* OBL *Elaeagnus angustifolia* OBL *Festuca pratensis* FACU	80 5 5	Riparian area 5 feet wide	Poor potential habitat, no thick shrubby riparian vegetation	Not recommended for trapping	No potential habitat
Unnamed ditch off Supply Ditch	B6	*Populus deltoids* subsp. *monilifera* FAC	20	Concrete lined irrigation ditch No wetland vegetation	Poor Potential Habitat, concrete lined ditch	Not recommended for trapping	No potential habitat
Highland Ditch	B7	none	80	Concrete lined ditch	No Potential Habitat, concrete lined ditch.	Not recommended for trapping	No potential habitat

Description	Crossing Feature No.	Dominant species (abbreviation legend at end of table)	Cover (%)	Comments	Potential for Preble's Habitat	Comments, Recommendations for Trapping	Potential for Ute Ladies'-tresses Orchid Habitat and Occurrence
Rough and Ready Ditch	B8	*Phalaris arundinacea* OBL *Cirsium arvense* FACU *Salix exigua* OBL *Salix amygdaloides* FACW	50 10 10 10	Riparian area 40 feet wide	Poor Potential Habitat, no downstream connection to river or stream, connects to Terry Lake	Riparian on both banks Not recommended for trapping	Marginal potential habitat, no downstream connection to river or stream, connects to Terry Lake
Longmont Supply Ditch	B9	*Phalaris arundinacea* OBL *Carex emoryi* OBL *Salix amygdaloides* FACW *Agrostis stolonifera* FACW	50 10 10 5	Riparian area 20 feet wide	Poor Potential Habitat, isolated riparian vegetation, no downstream connection to stream	Riparian on both banks Not recommended for trapping	Marginal potential habitat, isolated riparian vegetation, no downstream connection to stream
Oligarchy Ditch	B10	*Phalaris arundinacea* OBL *Carex emoryi* OBL *Agrostis stolonifera* FACW	10 5 50	Riparian area 20 feet wide Active ditch Low volume base flow in channel	Poor Potential Habitat, no riparian shrub vegetation present	Not recommended for trapping	Poor potential habitat

Description	Crossing Feature No.	Dominant species (abbreviation legend at end of table)	Cover (%)	Comments	Potential for Preble's Habitat	Comments, Recommendations for Trapping	Potential for Ute Ladies'-tresses Orchid Habitat and Occurrence
Mill Ditch	B11	*Carex emoryi* OBL *Phalaris arundinacea* OBL *Festuca pratensis* FACU *Salix fragilis* FAC	50 20 20 5	Riparian area 15 feet wide Flowing 2 cfs	Poor potential habitat, limited riparian shrubs/trees, heavily grazed	Not recommended for trapping	Poor potential habitat, limited riparian shrubs/trees, heavily grazed
Irrigation Ditch	B12	*Phalaris arundinacea* OBL *Festuca pratensis* FACU *Elaeagnus angustifolia* FAC	50 20 10	Riparian area 10 feet wide	Poor Potential Habitat, no riparian shrub vegetation	Not recommended for trapping	No potential habitat
Wet Meadow Wetland	B13	*Schoenoplectus pungens* OBL *Festuca pratensis* FACU *Thinopyrum ponticum* UPL	20 30 30	Appears to be dry area with residual wetland vegetation	Poor Potential Habitat, no riparian vegetation	Not recommended for trapping	No potential habitat

Description	Crossing Feature No.	Dominant species (abbreviation legend at end of table)	Cover (%)	Comments	Potential for Preble's Habitat	Comments, Recommendations for Trapping	Potential for Ute Ladies'-tresses Orchid Habitat and Occurrence
Unnamed ditch	B14	*Festuca pratensis* FAC *Typha latifolia* OBL *Salix exigua* OBL	80 10 10	Riparian area 5 feet wide No water flowing during survey period	Poor potential habitat, narrow field ditch, isolated willow stand	Not recommended for trapping	No potential habitat, narrow field ditch, isolated willow stand
Unnamed ditch	B15	*Carex emoryi* OBL *Asclepias speciosa* FAC *Helianthus nuttallii* FACW *Asparagus officinales* FACU-	80 T T T	Riparian area 12 feet wide Active ditch No water flowing during survey period	Poor potential habitat	Not recommended for trapping	Potential habitat None observed

Description	Crossing Feature No.	Dominant species (abbreviation legend at end of table)	Cover (%)	Comments	Potential for Preble's Habitat	Comments, Recommendations for Trapping	Potential for Ute Ladies'-tresses Orchid Habitat and Occurrence
St Vrain River	B16 NORTH	*Festuca pratensis* FAC *Phalaris arundinacea* OBL *Salix exigua* OBL *Schoenoplectus lacustris subsp.. creber* OBL	20 20 10 10	Riparian area 105 feet wide	Good Potential Habitat, the area has been trapped several times in the past; assume that no Preble's mice are present. Occupied habitat approx. 0.6 miles upstream.	The crossing area has been trapped once before (unknown date) with no captures, 2 negative trappings approx. 1 mile west just east of North 75 St. (1997,2000). One negative trapping 1 mile downstream of crossing (unknown date). Creek is considered occupied habitat to West of North 75 St. Because of past negative trapping in area not recommended for further trapping.	Potential habitat None observed

Description	Crossing Feature No.	Dominant species (abbreviation legend at end of table)	Cover (%)	Comments	Potential for Preble's Habitat	Comments, Recommendations for Trapping	Potential for Ute Ladies'-tresses Orchid Habitat and Occurrence
St Vrain River	B16 SOUTH	*Typha latifolia* OBL *Schoenoplectus lacustris* subsp. *creber* OBL *Carex emoryi* OBL *Salix exigua* OBL *Phalaris arundinacea* OBL *Panicum virgatum* FAC *Populus angustifolia* FACW *Agrostis stolonifera* FACW	5 5 10 50 20 T T T	Riparian area 105 feet wide	Good Potential Habitat, the area has been trapped several times in the past; assume that no Preble's mice are present. Occupied habitat approx. 0.6 miles upstream.	The crossing area has been trapped once before (unknown date) with no captures, 2 negative trappings approx. 1 mile west just east of North 75 St. (1997,2000). One negative trapping 1 mile downstream of crossing (unknown date). Creek is considered occupied habitat to West of North 75 St. Because of past negative trapping in area not recommended for further trapping.	Potential habitat None observed
Niwot Ditch (not shown on aerial photos)	B17	*Salix fragilis* FAC *Carex emoryi* OBL *Cirsium arvense* FACU *Phalaris arundinacea* OBL	5 50 5 10	Riparian area 8 feet wide Flowing < 1cfs	Poor Potential Habitat, limited shrubby riparian vegetation	Not recommended for trapping	Potential habitat None observed

Description	Crossing Feature No.	Dominant species (abbreviation legend at end of table)	Cover (%)	Comments	Potential for Preble's Habitat	Comments, Recommendations for Trapping	Potential for Ute Ladies'-tresses Orchid Habitat and Occurrence
East Branch of Clover Basin Ditch	B18	*Typha latifolia* OBL *Juncus arcticus* OBL *Elaeagnus angustifolia* OBL *Phalaris arundinacea* OBL *Eleocharis palustris* OBL	40 20 10 5 10	Riparian area 90 feet wide Low volume base flow present	Poor Potential Habitat, no shrubby riparian vegetation	Not recommended for trapping	Potential habitat None observed
Clover Basin Ditch	B19	*Sparganium eurycarpum* OBL *Phalaris arundinacea* OBL *Carex emoryi* OBL *Epilobium ciliatum* OBL	30 10 30 T	Riparian area 20 feet wide Active ditch No water flowing during survey Large 50 inch DBH *Populus deltoides* supsp. *monilifera* in vicinity	Poor Potential Habitat, no shrubby riparian vegetation	Not recommended for trapping	No potential habitat

Description	Crossing Feature No.	Dominant species (abbreviation legend at end of table)	Cover (%)	Comments	Potential for Preble's Habitat	Comments, Recommendations for Trapping	Potential for Ute Ladies'-tresses Orchid Habitat and Occurrence
Clover Basin Ditch	B20	*Populus deltoids subsp.. monilifera* FAC *Salix fragilis* FAC *Phalaris arundinacea* OBL	30 20 30	Riparian area 15 feet wide	Poor potential habitat, narrow ditch, isolated riparian stand	Not recommended for trapping	No potential habitat
Peck Ditch	B21	*Festuca pratensis* FAC	30	No wetland vegetation Ditch replaced with irrigation pipe	No Habitat	Not recommended for trapping	No potential habitat
Wet Meadow	B22	*Juncus arcticus* OBL *Schoenoplectus pungens* OBL *Distichlis stricta* FACW	20 60 10	Wet meadow with no outflow	No Habitat	Not recommended for trapping	No potential habitat
Unnamed drainage	B23	*Festuca pratensis* FAC *Juncus arcticus* OBL *Eleocharis palustris* OBL	20 10 10	Riparian area 10 feet wide Water flowing in channel	Poor Potential Habitat, no shrubby riparian vegetation	Not recommended for trapping	No potential habitat

Description	Crossing Feature No.	Dominant species (abbreviation legend at end of table)	Cover (%)	Comments	Potential for Preble's Habitat	Comments, Recommendations for Trapping	Potential for Ute Ladies'-tresses Orchid Habitat and Occurrence
North Dry Creek (BOCO)	B24	*Typha latifolia* OBL *Schoenoplectus pungens* OBL	60 20	Riparian area 30 feet wide Water flowing < 1cfs	Poor Potential Habitat, no shrubby riparian vegetation	Water flowing < 1cfs	Potential habitat None observed
James Ditch	B25	*Carex emory* OBL *Phalaris arundinacea* OBL *Elaeagnus angustifolia* OBL *Asclepias speciosa* FAC *Apocynum cannabinum* FAC	50 20 5 T T	Riparian area 15 feet wide Water flowing Part of James Ditch and connects to wetland site number B22	Poor Potential Habitat, no shrubby riparian vegetation	Not recommended for trapping	Marginal potential habitat
James Ditch	B26	*Salix exigua* OBL *Phalaris arundinacea* OBL	50 30	Riparian are 15 feet wide Water flowing	Poor potential habitat, narrow ditch, isolated willow stand	Not recommended for trapping	Marginal potential habitat

Description	Crossing Feature No.	Dominant species (abbreviation legend at end of table)	Cover (%)	Comments	Potential for Preble's Habitat	Comments, Recommendations for Trapping	Potential for Ute Ladies'-tresses Orchid Habitat and Occurrence
James Ditch	B27	*Phalaris arundinacea* OBL	80	Riparian area 10 feet wide Water flowing	Poor Potential Habitat, no shrubby riparian vegetation	Not recommended for trapping	Marginal potential habitat
Dry Creek (BOCO)	B28	*Festuca pratensis* FAC *Phalaris arundinacea* OBL *Carex emoryi* OBL	20 20 20	Riparian area 10 feet wide No water present Channelized creek	Poor Potential Habitat, no shrubby riparian vegetation	Not recommended for trapping	Marginal potential habitat
Dry Creek (BOCO)	B29 NORTH	*Eleocharis palustris* OBL *Distichlis stricta* FACW *Polypogon monspeliensis* OBL *Sporobolus airoides* OBL	30 20 10 10	Riparian area 20 feet wide Alkaline wet meadow Water flowing < 1cfs Saturated to surface Some standing water	Poor Potential Habitat, no shrubby riparian vegetation	Not recommended for trapping	Potential habitat None observed

Description	Crossing Feature No.	Dominant species (abbreviation legend at end of table)	Cover (%)	Comments	Potential for Preble's Habitat	Comments, Recommendations for Trapping	Potential for Ute Ladies'-tresses Orchid Habitat and Occurrence
Dry Creek (BOCO)	B29 SOUTH	*Distichlis stricta* FACW *Juncus arcticus* OBL *Spergularia marina* OBL *Schoenoplectus pungens* OBL *Sporobolus airoides* OBL *Juncus articulatus* OBL	30 20 10 10 20 10	Riparian area 20 feet wide Alkaline wet meadow Water flowing < 1cfs Saturated to surface Some standing water	Poor Potential Habitat, no shrubby riparian vegetation	Not recommended for trapping	Potential habitat None observed
Unnamed ditch	B30	*Salix exigua* OBL *Bromus inermis* FACW* *Asclepias speciosa* FAC *Festuca pratensis* FAC *Solidago Canadensis* FACU	50 20 T 20 5	No channel present	Poor potential habitat, narrow field ditch, isolated willow stand	Not recommended for trapping	No potential habitat

Description	Crossing Feature No.	Dominant species (abbreviation legend at end of table)	Cover (%)	Comments	Potential for Preble's Habitat	Comments, Recommendations for Trapping	Potential for Ute Ladies'-tresses Orchid Habitat and Occurrence
Holland Ditch	B31	*Festuca pratensis* FAC *Agrostis stolonifera* FACW *Carex sp.* *Juncus arcticus* FAC *Elaeagnus angustifolia* OBL *Conium maculatum* FACW	60 10 10 5 T T	Riparian area 12 feet wide	Poor Potential Habitat, no shrubby riparian vegetation	Not recommended for trapping	No potential habitat
Unnamed ditch	B32	*Juncus arcticus* OBL *Phalaris arundinacea* OBL	90 10	Riparian area 2 feet wide Water seeps to north to 20 feet wide by 100 foot long wetland area west of fence line (not numbered on map)	Poor Potential Habitat, no shrubby riparian vegetation	Not recommended for trapping	Potential habitat None observed

Description	Crossing Feature No.	Dominant species (abbreviation legend at end of table)	Cover (%)	Comments	Potential for Preble's Habitat	Comments, Recommendations for Trapping	Potential for Ute Ladies'-tresses Orchid Habitat and Occurrence
Wet Meadow Wetland	B33	*Eleocharis palustris* OBL *Schoenoplectus pungens* OBL *Typha latifolia* OBL *Festuca pratensis* FAC	50 25 5 5	Emergent wetland area in seep area	No Habitat	Not recommended for trapping	Potential habitat None observed
Left Hand Creek	B34	*Populus deltoids* subsp. *monilifera* FACW *Alnus incana subsp.. tenuifolia* FACU/FACW *Elaeagnus angustifolia* OBL *Festuca pratensis* FAC *Salix fragilis* FAC	20 10 10 50 10	Riparian area 80 feet wide	Good Potential Habitat	Negative Trapping 2007	Potential habitat None observed

Description	Crossing Feature No.	Dominant species (abbreviation legend at end of table)	Cover (%)	Comments	Potential for Preble's Habitat	Comments, Recommendations for Trapping	Potential for Ute Ladies'-tresses Orchid Habitat and Occurrence
Unnamed ditch	B35	*Elaeagnus angustifolia* OBL *Festuca pratensis* FAC *Populus deltoids subsp. monilifera* FACW	50 30 10	Riparian area 15 feet wide Water flowing 1-2 cfs	Poor Potential Habitat, limited riparian shrubby vegetation	Not recommended for trapping	No potential habitat
Hinman Ditch	B36	*Festuca pratensis* FAC	50	Riparian area 3 feet wide	Poor Potential Habitat	Not recommended for trapping	No potential habitat
Star Ditch	B37	*Festuca pratensis* FAC *Carex emoryi* OBL *Elaeagnus angustifolia* OBL *Pinus ponderosa* FACU- *Populus angustifolia* FACW	60 10 Upland Upland Upland	Riparian area 4 feet wide	Poor Potential Habitat, no shrubby riparian vegetation	Not recommended for trapping	No potential habitat

Description	Crossing Feature No.	Dominant species (abbreviation legend at end of table)	Cover (%)	Comments	Potential for Preble's Habitat	Comments, Recommendations for Trapping	Potential for Ute Ladies'-tresses Orchid Habitat and Occurrence
Reservoir outflow	B38	*Typha latifolia* OBL *Salix amygdaloides* FACW *Juncus arcticus* OBL *Phalaris arundinacea* OBL *Cirsium arvense* FACU	Variable Variable Variable Variable Variable	Narrow wetland area 5 to 15 feet wide and 1000 feet long Water flowing 1 cfs	Poor Potential Habitat, very limited shrubby riparian vegetation	Not recommended for trapping	Potential habitat None observed
Little Dry Creek	B39	*Distichlis stricta* FACW *Cirsium arvense* FACU *Spergularia marina* OBL *Typha latifolia* OBL *Juncus arcticus* OBL *Sporobolus airoides* FAC *Hordeum jubatum* FACW	10 T 10 50 10 5 5	Alkaline wet meadow to south of creek Water flowing in creek 2 cfs Saturated wet meadow area to north of creek	Poor Potential Habitat, no shrubby riparian vegetation	Not recommended for trapping	Potential Habitat None observed

Description	Crossing Feature No.	Dominant species (abbreviation legend at end of table)	Cover (%)	Comments	Potential for Preble's Habitat	Comments, Recommendations for Trapping	Potential for Ute Ladies'-tresses Orchid Habitat and Occurrence
Reservoir outflow	B40	No vegetation		No wetland vegetation	No Habitat	Not recommended for trapping	No potential habitat
Highland Ditch	BE41	*Phalaris arundinacea* OBL *Salix fragilis* FAC *Echinochloa crus-galli* FACW	30 20 5	Riparian area 20 feet wide Water flowing in channel	Poor potential habitat, narrow ditch, isolated willow stand	Not recommended for trapping	No potential habitat
Clark Reservoir	BE42	*Festuca pratensis* FAC	80	No wetland vegetation	No Habitat	Not recommended for trapping	No potential habitat
Rough and Ready Ditch	BE43	*Populus deltoids subsp. monilifera* FACW *Salix fragilis* FAC *Phalaris arundinacea* OBL *Salix exigua* OBL	50 20 10 5	Riparian area 30 feet wide Active ditch No water in channel	Poor Potential Habitat, no downstream connection to river or stream, connects to Terry Lake	Not recommended for trapping	No potential habitat

Description	Crossing Feature No.	Dominant species (abbreviation legend at end of table)	Cover (%)	Comments	Potential for Preble's Habitat	Comments, Recommendations for Trapping	Potential for Ute Ladies'-tresses Orchid Habitat and Occurrence
Rough and Ready Ditch	BE44	*Populus deltoids subsp. monilifera* FACW	10	Riparian area 25 feet wide Active ditch Little vegetative cover on banks	Poor Potential Habitat, no downstream connection to river or stream, connects to Terry Lake	Not recommended for trapping	No potential habitat
Unnamed irrigation ditch	BE45	Concrete lined ditch		2 concrete lined ditches in this location	No Habitat, concrete lined	Not recommended for trapping	No potential habitat
Unnamed pond and irrigation ditch	BE46	*Festuca pratensis* FAC *Juncus arcticus* OBL *Eleocharis palustris* OBL	50 25 25	Small pond with standing water 1 foot deep	Poor Potential Habitat, no shrubby riparian vegetation.	Not recommended for trapping	No potential habitat
Eisele Lateral Ditch	B47	Concrete lined ditch		concrete lined ditches in this location	No Habitat, concrete lined	Not recommended for trapping	No potential habitat

Legend: T = Trace amounts of vegetation; OBL = Obligate wetland species; FACW = Facultative wetland species; FAC = Facultative species; FACU = Facultative upland species; UPL = Upland species; NI = No indication

Northern Colorado Water Conservancy District 7/25/2017

SWSP II

Projected 2018-2019 Expenditures

2018-2019 Construction Costs

Entity	Capacity (cfs)	Construction Costs	SWSP Outlet Costs	**Total 2018-2019 Costs**
Longs Peak Water District	3	$ 1,051,673	$ 92,292	**$ 1,143,965**
Left Hand Water District	12	$ 10,366,127	$ 369,166	**$ 10,735,293**
City of Boulder	32	$ 31,026,307	$ 984,443	**$ 32,010,750**
Totals	47	$ 42,444,107	$ 1,445,901	**$ 43,890,008**

Northern Colorado Water Conservancy District 7/21/2017
SWSP II
2018-2019 Costs

Management Costs

Item		Estimated Cost
NCWCD	$	525,000
Dewberry	$	700,000
BoCo Inspector	$	150,000
QA & Testing	$	150,000
Other Misc.	$	100,000
Total	$	1,625,000

Participant		Estimated Cost
Longs Peak W.D.	$	42,703
Left Hand W.D.	$	374,631
Boulder	$	1,207,666
	$	1,625,000

Segment Specific Construction Cost

(Based Upon June 2017 Dewberry Cost Estimate)

Contingency 5%

Pipe Segment	Description	Construction Cost	CMS Cost	SCADA Cost Est.	Add. Cont.	Total Cost
SW2.1	Carter to Eastern TO	$ 14,979,934	$ 669,012.50	$ 50,000	$ 784,947.33	$ 16,483,894
SWS2.2	Eastern TO to Left Hand TO	$ 18,683,761	$ 728,306.19	$ 50,000	$ 973,103	$ 20,435,171
SW2.21	Left Hand TO	$ 488,224	$ 19,031.31	$ 50,000	$ 27,863	$ 585,118
SW2.3	Left Hand TO to Boulder TO	$ 4,446,039	$ 208,650.00	$ 50,000	$ 235,234	$ 4,939,924
	Total	$ 38,597,958	$ 1,625,000	$ 200,000	$ 2,021,148	$ 42,444,106

Construction Costs per Participant:

Participant	Percent		SW2.1 Percent	Cost	SW2.2 Percent	Cost	SW2.21 Percent	Cost	SW2.3 Percent	Cost	**Total**
Longs Peak W.D.		6.38%	6.38%	$ 1,051,673	0%		0%		0%		**$ 1,051,673**
Left Hand W.D.		25.53%	25.53%	$ 4,208,338	27.27%	$ 5,572,671	100%	$ 585,118	0%		**$ 10,366,127**
Boulder		68.09%	68.09%	$ 11,223,883	72.73%	$ 14,862,500	0%		100%	$ 4,939,924	**$ 31,026,307**
Total		100.00%	100.00%	$ 16,483,894	100.00%	$ 20,435,171	100%	$ 585,118	100%	$ 4,939,924	**$ 42,444,107**

Northern Colorado Water Conservancy District 7/25/2017

SWSP II

2018-2019 Costs

Outlet Works Modification Cost Allocation

Original Cost (1995):	$	3,665,000
1994 December ENR		4008
2017 July ENR		7388
Escalation		1.843
Original SWSP Outlet Capacity (cfs)		95.9
SWSP Capacity with 80%		172.6
SWSP II Capacity		47
Total New Capacity		219.6
Cost/cfs (1995) Original	$	38,216.89
Cost/cfs (2017) with SWSP II	$	30,763.86

Construction Costs per Participant:

Participant	cfs		Cost
Boulder	32	$	984,443.50
Left Hand W.D.	12	$	369,166.31
Longs Peak W.D.	3	$	92,291.58

Northern Colorado Water Conservancy District 7/21/2017
SWSP II
2018-2019 Costs
Allocation

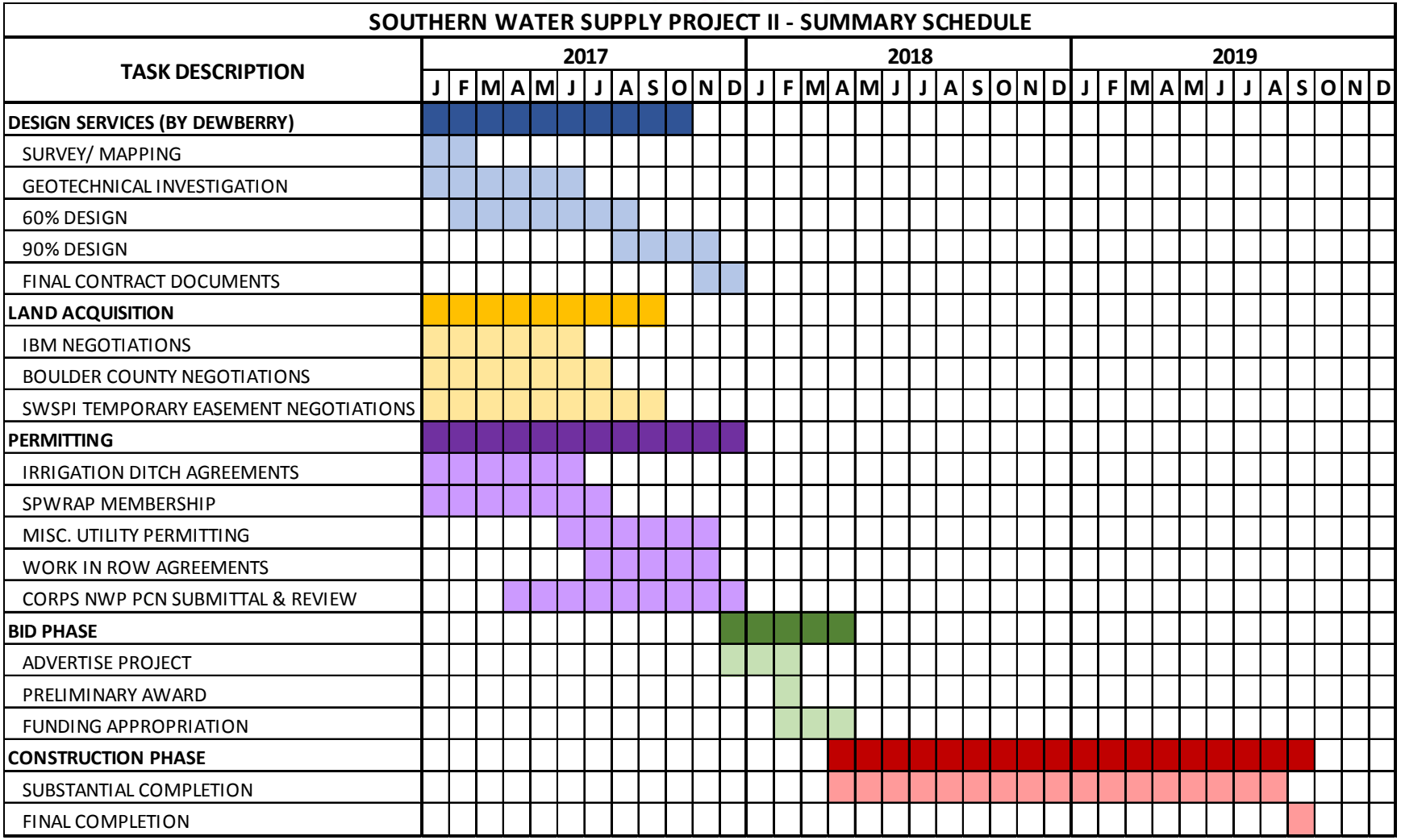
Participant	Capacity (cfs)
Longs Peak W.D.	3
Left Hand W.D.	12
Boulder	32
Total	47

Segment	Segment Designation	Segment Length (ft)	Percent of Length	Segment Capacity (cfs)
Carter Outlet to Eastern Turnout	SW2.1	45,200	41.17%	47
Eastern Turnout to Left Hand	SW2.2	50,500	45.99%	44
Left Hand to Boulder	SW2.3	14,100	12.84%	32
	Total	109,800	100.00%	

	Segments			
Participant	SW2.1	SW2.2	SW2.3	Total
Longs Peak W.D.	2.63%			2.63%
Left Hand W.D.	10.51%	12.54%		23.05%
Boulder	28.03%	33.45%	12.84%	74.32%
	41.17%	45.99%	12.84%	100.00%

SWSP II
Northern Water
Southern Water Supply Project

SOUTHERN WATER SUPPLY PROJECT II - SUMMARY SCHEDULE



LARIMER COUNTY
COMMITTED TO EXCELLENCE

PLANNING AND BUILDING SERVICES DIVISION

P.O. Box 1190
Fort Collins, Colorado 80522-1190
Planning (970) 498-7683 Building (970) 498-7700
Planning Fax (970) 498-7711 Building Fax (970) 498-7667
http://www.larimer.org/planning

Thursday, June 18, 2009

SOUTHERN WATER SUPPLY PROJECT WATER ACTIVITIES ENTERPRISE

BROUWER, CARL
220 WATER AVE.
BERTHOUD, CO 80513

Dear Applicant:

Your application for SOUTHERN WATER SUPPLY L&E (09-Z1735) was heard before the Larimer County Planning Commission on Wednesday, May 20, 2009. At the hearing, the Planning Commission approved your application. A copy of the official record of the Larimer County Planning Commission action is attached for your information.

If you have questions regarding your application or need further assistance, please contact Rob Helmick, Senior Planner, at 970-498-7682 or rhelmick@larimer.org.

Respectfully,

Larimer County Planning Department

PC: FILE 09-Z1735

INTEGRA ENGINEERING PARKS, RANDY

EDAW

LARIMER COUNTY PLANNING COMMISSION
Minutes of May 20, 2009

The Larimer County Planning Commission met in a regular session on Wednesday, May 20, 2009, at 6:30 p.m. in the Hearing Room. Commissioners Cox, Glick, Hart, Hess, Oppenheimer, and Wallace were present. Commissioners Benton and Weitkunat were absent. Commissioner Morgan presided as Chairman. Also present were Russell Legg, Chief Planner, Karin Madson, Planner, II, Jill Bennett, Principle Planner, Rob Helmick, Senior Planner, Traci Downs, Engineering Department, Doug Ryan, Health Department and Jill Wilson, Planning Technician and Recording Secretary.

Rob Helmick accompanied Commissioners' Cox, Glick, Hart, Morgan, and Wallace today on a site visit to Midori Planned Land Division/Planned Development and Southern Water Supply Location and Extent.

COMMENTS BY THE PUBLIC REGARDING THE COUNTY LAND USE CODE:
None

COMMENTS BY THE PUBLIC REGARDING OTHER RELEVANT LAND USE MATTERS NOT ON THE AGENDA:
None

APPROVAL OF THE MINUTES FOR THE APRIL 15, 2009 MEETINGS: MOTION by Commissioner Cox to approve the minutes, seconded by Commissioner Glick. This received unanimous voice approval.

AMENDMENTS TO THE AGENDA:
None

CONSENT ITEMS:

ITEM #1 SOUTHERN WATER SUPPLY LOCATION AND EXTENT #09-Z1735: Mr. Helmick provided background information on the request for a 45-60 inch diameter water pipeline which would draw water from Carter Lake and deliver it to users in Boulder and Weld Counties.

Commissioner Hart asked to have the applicant explain the deviation in the pipeline route.

Mr. Helmick pointed out that the proposed pipeline did follow a pipeline that was built in 1995 and followed the alignment exactly in Larimer County except at the point where the pipeline followed County Road 8E east and then turned south. There were a number of geological issues that made the applicant initially choose to follow another alignment which had need for all new easement opposed to additional easement for construction and installation.

Commissioner Wallace asked if the pipeline would avoid the Bells Twin Pot.

Mr. Helmick stated that as a threatened plant species the applicant did have an obligation to avoid those areas if possible and it was part of their environmental analysis.

Jim Struble, Real Estate Manager for Northern Colorado Water Conservancy District, explained that the deviation from the original easement was because on the north side of County Road 8E there was a property owner the built a house directly adjacent to the pipeline easement. In doing so some excavation was done and they were concerned that the hillside could potential slide. They had taken additional time to look at it and there was potential that they might stay within that existing easement and do different design techniques because the concern of going down the main road to Sedona Hills was that there was a creek bed that flowed through that area and the concern was that the creek bed was migrating east and there were concerns that the creek bed would continue to erode east. Regarding the Bells Twin Pot, they would be avoiding those areas.

DISCUSSION:

Commissioner Wallace moved that the Planning Commission adopt the following Resolution:

> BE IT RESOLVED that the Planning Commission approve the Southern Water Supply Location and Extent, file #09-Z1735, subject to the following conditions:
>
> 1. The applicant shall coordinate all ditch crossings with the appropriate ditch companies.
> 2. The applicant shall obtain the necessary permits from Larimer County for all public road crossings.
> 3. The pipeline excavation shall be promptly revegetated and managed to avoid noxious weed infestations and to insure air and water quality are preserved.
> 4. The applicant shall obtain all necessary permits from the State government for air and water quality.
> 5. The applicant shall obtain all necessary wetland or other federal permits.

Commissioner Hart seconded the Motion.

Commissioners' Cox, Glick, Hart, Hess, Oppenheimer, Wallace, and Chairman Morgan voted in favor of the Motion.

MOTION PASSED: 7-0

Boulder County

Land Use

Courthouse Annex • 2045 13th Street • Boulder, Colorado 80302 • Tel: 303.441.3930 • Fax: 303.441.4856
Mailing Address: P.O. Box 471 • Boulder, Colorado 80306 • **www.bouldercounty.org**

July 16, 2012

Southern Water Supply Enterprise
Attn: Carl Brouwer
220 Water Avenue
Berthoud, CO 80513

Dear Applicant:

This letter certifies that a hearing of the Board of County Commissioners, County of Boulder, State of Colorado, was duly called and held on January 10, 2012 continued to April 17, 2012 and June 21, 2012, in consideration of the following request:

Docket SI-11-0001: SOUTHERN WATER SUPPLY PIPELINE II

Request: Areas and Activities of State Interest (1041) for the construction of a water pipeline which would deliver Windy Gap and Colorado-Big Thompson water from Carter Lake to the project participants which include the City of Boulder, Left Hand Water District, Longs Peak Water District, and the Town of Frederick. The project consists of a north-south pipeline which will serve the City of Boulder and Left Hand Water District and an east-west pipeline that will branch from the north-south alignment to serve the Longs Peak Water District and the Town of Frederick.

Location: Northeastern Boulder County, the proposed pipeline enters the County at the north approximately 1.0 mile west of N 83rd St. and runs south past the City of Longmont to Boulder Reservoir; the eastern branch of the pipeline is proposed along Vermillion Road beginning approximately 0.5 mile west of N 87th St running east to County Line Road, in Sections 1,12,13,25,36, of Range 3N, Township 70W, and Sections 1,12,13,24,23,26,34,35 of Range 2N, Township 70W, and Section 3 of Range 1N, Township 70W, Sections 7,13,14,15,16,17,18,19, 20, 21, 22, 23, 24, 30, 31 of Range 3N, Township 69W, and Section 6 of Range 2N, Township 69W.

Zoning: Estate Residential (ER), Rural Residential (RR) and Agricultural (A) Zoning Districts

The Board of County Commissioners has determined that the request is CONDITIONALLY APPROVED, subject to the terms in the attached resolution.

Your approval may have included certain conditions that must be met. Please contact the planner who processed your docket for more information on any requirements that will need to be met. If you have any additional questions, please feel free to contact me at (303) 441-3930 or via email at hhippely@bouldercounty.org

Sincerely,

Hannah Hippely, AICP, Senior Planner
Planning Division

c.c. Rosi Dennett, Strategic Planning, Inc.

RESOLUTION 2012-70

A RESOLUTION CONDITIONALLY APPROVING BOULDER COUNTY LAND USE DOCKET #SI-11-0001 ("SOUTHERN WATER SUPPLY PIPELINE II"): A REQUEST FOR AN ACTIVITIES OF STATE INTEREST ("SI" OR "1041") REVIEW FOR THE BOULDER COUNTY PORTION OF A NEW PIPELINE TO BE CONSTRUCTED TO DELIVER WINDY GAP AND COLORADO-BIG THOMPSON WATER FROM CARTER LAKE TO THE PROJECT PARTICIPANTS (CITY OF BOULDER, LEFT HAND WATER DISTRICT, LONGS PEAK WATER DISTRICT, AND TOWN OF FREDERICK), CONSISTING OF A NORTH-SOUTH ALIGNMENT TO SERVE THE LEFT HAND WATER DISTRICT AND THE CITY OF BOULDER, AND AN EAST-WEST ALIGNMENT BRANCHING FROM THE NORTH-SOUTH PIPELINE TO SERVE THE LONGS PEAK WATER DISTRICT AND TOWN OF FREDERICK, ON PROPERTY LOCATED IN NORTHEASTERN BOULDER COUNTY (ENTERING BOULDER COUNTY FROM THE NORTH APPROXIMATELY ONE MILE WEST OF N. 83RD STREET AND RUNNING SOUTH PAST THE CITY OF LONGMONT TO THE BOULDER RESERVOIR, WITH THE EASTERN PIPELINE BRANCHING TO EXTEND ALONG VERMILLION ROAD BEGINNING APPROXIMATELY 0.5 MILE WEST OF N. 87TH STREET AND EXTENDING EAST TO COUNTY LINE ROAD), IN SECTIONS 1, 12, 13, 25, AND 36 OF RANGE 3N, TOWNSHIP 70W; SECTIONS 1, 12, 13, 23, 24, 26, 34, AND 35 OF RANGE 2N, TOWNSHIP 70W; SECTION 3 OF RANGE 1N, TOWNSHIP 70W; SECTIONS 7, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 30, AND 31 OF RANGE 3N, TOWNSHIP 69W; AND SECTION 6 OF RANGE 2N, TOWNSHIP 69W, UNINCORPORATED BOULDER COUNTY

WHEREAS, the Board of County Commissioners of the County of Boulder ("the Board") has duly approved and adopted regulations to designate areas and activities of state interest and to govern the administration of any designated activities and areas of state interest in unincorporated Boulder County pursuant to Article 65.1 of Title 24, as amended, commonly referred to as House Bill 1041 ("the 1041 Regulations"), which are codified as Article 8 of the Boulder County Land Use Code ("the Land Use Code"); and

WHEREAS, the 1041 Regulations designate the following activities of state interest which require application for and approval of a County permit, all as further set forth in the Regulations:

> (1) Site selection and construction of major new domestic water and sewage treatment systems, and major extension of existing domestic water and sewage treatment systems, as defined in Sections 25-9-102(5) ("wastewater treatment plant"), 25-9-102(6) ("water supply system"), and 25-9-102(7)

("water)treatment plant"), C.R.S. (see Sections 24-65.1-104(5) and 24-65.1-203 (1)(a)); and

(2) Efficient utilization of municipal and industrial water projects (see Section 24-65.1-203(1)(h)); and

WHEREAS, the 1041 Regulations also designate areas of state interest constituting flood hazard and geologic hazard areas, which portions of the subject project/activity of state interest involved here will cross; and

WHEREAS, the Northern Colorado Water Conservancy District, acting by and through the Southern Water Supply Project Water Activity Enterprise ("Applicant"), has applied to the County for a 1041 ("state interest") permit to construct a buried raw water pipeline ("Southern Water Supply Pipeline II"), to transport Windy Gap/Colorado-Big Thompson supplies from Carter Lake in Larimer County, into and through unincorporated Boulder County, to serve the project/enterprise participants (City of Boulder, Left Hand Water District, Longs Peak Water District, and Town of Frederick) for the purposes of improving water quality, providing year-round supply, and meeting increased demand; and

WHEREAS, the Boulder County portion of the new pipeline is proposed to run along the Applicant's preferred alternative route which is generally described in the caption to this Resolution, above, and affects unincorporated lands located in the Estate Residential, Rural Residential, and Agricultural Zoning Districts; and

WHEREAS, the proposed project is the second such pipeline to be constructed in Boulder County by the Applicant, with the original Southern Water Supply Pipeline having been built in 1995, though the original pipeline was not reviewed under the County's 1041 Regulations since the Board of County Commissioners ("the Board") determined that the project was substantially initiated before the 1041 Regulations' effective date in January, 1994; and

WHEREAS, the proposed project consists of a main north-south pipeline route, along with the so-called "Eastern Turnout" which is a smaller pipeline branching off from the main route to head east to the Boulder County-Weld County line; and

WHEREAS, the City of Boulder would own 25 of the total 45 cubic feet per second (cfs) capacity of the new pipeline, with the Left Hand Water District to own 11 cfs, the Longs Peak Water District to own 3 cfs, and the Town of Frederick to own 6 cfs; and

WHEREAS, in order to convey the 45 cfs capacity required by the project participants, a 45-inch-diameter pipe will generally be necessary, though as water is diverted from the main pipe the size of the pipe required would diminish; and

WHEREAS, where the proposed pipeline enters Boulder County at the northern County line a 45-inch-diameter pipe would be installed, and extended south to the point where the Eastern Turnout diverts water from the main pipeline, with a 36-inch-diameter pipe then being run south from the Eastern Turnout to the Left Hand Water District's Dodd Water Treatment Plant, from which the point south to the City of Boulder's water treatment plant the pipeline would be 30 inches in diameter; and

WHEREAS, the Eastern Turnout is proposed to be constructed using 24-inch to 26-inch-diameter pipe; and

WHEREAS, construction of the project requires not only that the Applicant secure a permanent easement for the pipeline and its appurtenances, but also that enough of a construction corridor be obtained to provide adequate space for the various components of the construction, with the total construction corridor to be made up of a combination of permanent easements, temporary construction easements, and use of existing rights of way; and

WHEREAS, the alternatives analysis provided by the Applicant for the southern portion of the main pipeline route (which, unlike the northern portion, does not use the existing easement of the original Southern Water Supply Pipeline), considers three potential alternative alignments, in addition to the Applicant's proposed (preferred) alignment for this pipeline portion; and

WHEREAS, construction of the pipeline is anticipated to begin between 2014 and 2015, with construction generally proceeding from north to south, though seasonal constraints may require some construction to be done out of sequence; and

WHEREAS, the pace for pipeline construction likely will range between 200 to 400 feet per day, with the rate significantly slowing in areas where the corridor is constrained by features such as stream crossings (where construction is expected to take 7-14 days), or at other locations (such as highway or road crossings)

where boring methods rather than trenching methods may be required; and

WHEREAS, the success of long-term surface restoration following construction depends in large part on the care taken during the excavation process, to separate topsoil from subsoil and stockpile the layers so that they may be replaced in their proper order during the backfill portion of the project, so that the mixing of less productive soils with productive soils can be avoided; and

WHEREAS, the above-described water pipeline project was processed and reviewed as Boulder County Land Use Docket #SI-11-0001 ("the Docket"), all as further set forth in the written memoranda and recommendations of the County Land Use Department Planning Staff to the Board dated January 10, May 24, and June 21, 2012, with their attachments (collectively, "the Staff Recommendation"); and

WHEREAS, on January 10, 2012, as continued to April 17 and June 21, 2012, the Board held a duly-noticed public hearing on the Docket ("the Public Hearing"), at which time the Board considered the Staff Recommendation as well as the documents and testimony presented by the County Land Use Department Planning Staff, representatives of the Applicant and the project participants, a representative of the City of Longmont, and several members of the public, all as reflected on the official record of the Public Hearing; and

WHEREAS, based upon the Public Hearing, the Board finds that the Docket (specifically, as proposed by the Applicant, including its preferred alternative ("Alternative 1") for the southern portion of the main pipeline route), meets the applicable criteria for a permit pursuant to the 1041 Regulations, and can be approved, subject to the conditions imposed below which the Board finds are reasonable conditions capable of effectively mitigating the impacts of the proposed water pipeline project as identified on the record of the Public Hearing; and

WHEREAS, in reaching this conclusion, the Board finds, based on the entire record of the Public Hearing, that given the conditions of approval proposed in the May 24 and June 21 Staff Recommendation, as reviewed and revised by the Board at the June 21, 2012 Public Hearing, the project can satisfy the applicable 1041 criteria regarding preservation of productive agricultural land and compliance with the Boulder County Comprehensive Plan, and finds further that the project participants possess the requisite financial capability to undertake the project; and

WHEREAS, the proposed project thus meets the above-referenced 1041 requirements, which the initial January 10 Staff Recommendation had found were not fulfilled, and the Docket is authorized to proceed in accordance with the conditions of this approval.

NOW, THEREFORE, based upon the findings made in this Resolution, above, as supported by the record of the Public Hearing, **BE IT RESOLVED** that the Docket is hereby approved, subject to the following conditions:

General Approval Conditions:

1. The Applicant shall be subject to the terms, conditions, and commitments of record and in the file for the Docket, including but not limited to the prevention of degradation to environmental resources, the restoration of the surface to preconstruction conditions, the minimization of impacts to recreation facilities, and the preservation of cultural resources.

2. The Applicant shall provide the public with means to find information about the project and have questions answered by the Applicant. The Applicant shall create a website related to the project and shall notice that website to impacted property owners, County agencies, and Fire Districts. An updated schedule and construction phasing plan shall be maintained on this website. In addition, the Applicant shall create a hotline where the public may raise concerns or ask questions and expected a response within 24 hours.

3. Engineering and construction plans for 50% and 95% project completion must be submitted for review and approval by the County Land Use, Parks and Open Space, and Transportation Departments prior to permit issuances. Final plans shall include, but not be limited to, a staging plan, temporary and permanent erosion control plans, stormwater management plan, and fugitive dust control plan.

4. All phases of construction shall be done in compliance with applicable federal, state, and local statues and regulations, including fulfilling all legal obligations to identify, protect, and re-establish public and private survey markers and monuments that exist within proximity to the construction area, and these conditions of approval. Prior to any construction-related activity associated with any individual phase of pipeline construction, the Applicant shall meet with County Land Use, Transportation and Parks and Open Space personnel to ensure all the necessary conditions related to

each phase of construction have been completed and all permits have been obtained.

Easements, Permissions, and Other Permits:

5. Prior to any construction activities or issuance of any permits, the Applicant shall obtain all easements or other property rights and approvals necessary for the proposal, including crossing agreements or otherwise satisfying the requirements of all ditch companies impacted by the pipeline construction. The Applicant shall provide the County Land Use, Parks and Open Space, and Transportation Departments with GIS shapefiles showing the finalized full length of the pipeline route. The Applicant shall provide detailed information (on a parcel/property specific basis or pipeline segment basis) regarding the associated easement widths and types (permanent versus construction) and shall identify the linear footage of pipeline construction that will parallel Boulder County road rights-of-way, as well as identify any areas where the construction will encroach into the rights-of-way.

6. Any activity involving existing Public Service Company right-of-way will require Public Service Company approval. Encroachments across Public Service Company's easements must be reviewed for safety standards, operational and maintenance clearances, and liability issues, and be acknowledged with a Public Service Company License Agreement to be executed with the property owner.

7. Development within mapped floodplains will require a separate floodplain development permit, when the Applicant proposes an open cut to place the pipeline across the stream channel, or install permanent structures that extend above the current ground surface within the floodplain boundaries.

8. Prior to any construction activities, the Applicant must obtain federal Endangered Species Act clearances for threatened and endangered species, including Preble's meadow jumping mouse, Spiranthes diluvialis (Ute ladies' tresses orchid) and Gaura neomexicana coloradensis (Colorado butterfly plant), through the entire length of the pipeline. Any necessary Spiranthes field surveys should follow USFWS protocols as to timing windows.

9. The U.S. Army Corps of Engineers shall be consulted to ensure that construction of the project is in compliance with applicable federal regulations. Wetland delineations, defined and required by the US Army Corps of Engineers, may be needed on some properties; such delineations shall be completed in the proper season. Additionally the Applicant shall review

Colorado SB 40 (regarding wildlife certification from the Colorado Division of Wildlife (DOW) when an agency of the state plans construction in any stream or its bank or tributaries) and ensure that certification requirements are being met as applicable.

10. All practicable methods (including watering, re-vegetation, synthetic cover, and/or chemical stabilization) shall be used to minimize fugitive particulates. The contractor will be responsible for developing and implementing a fugitive dust control plan. The plan shall be submitted and approved by Boulder County Health and/or the Colorado Division of Public Health and Environment prior to construction-related activities.

11. The Applicant shall obtain a storm water discharge and construction dewatering permit from the Colorado Department of Public Health and Environment for construction at drainage crossings. These permits will include the preparation of a Storm Water Management Plan (SWMP) and Best Management Practices (BMPs) to prevent storm water runoff and sediment in disturbed areas from reaching nearby waterways or otherwise leaving the site. BMPs will be consistent with the Urban Drainage and Flood Control District's Urban Storm Drainage Criteria Manual, Volume 3. Typical measures employed may include detention basins, silt fences, hay bales, wattles, and hydro mulch. These measures will deflect runoff, collect sediment, and allow infiltration. Storm water and erosion control measures will be carefully monitored during construction and examined after each storm event to ensure their effectiveness. All project access points shall incorporate vehicle-tracking devices to prevent tracking onto adjacent roads.

12. Prior to construction-related activities and through project completion, the Applicant shall comply with all adopted fire codes, and in addition shall provide the final route alignment and schedule to the Fire Districts. The Applicant shall communicate with the Fire Districts regarding potential impacts to emergency response routes, including but not limited to road or lane closures. The Applicant shall ensure that a contact person is designated with whom the representatives of the Fire District may communicate during the construction of the project.

County Rights-of-Way:

13. When construction activity is taking place within Boulder County rights-of-way, a Utility Construction Permit is required. The Applicant shall abide by the Utility Construction Standards and comply with the conditions of the

Utility Construction Permit, including but not limited to restrictions on hours of operation. The Applicant should also note that when construction activity is parallel to Boulder County rights-of-way, the rights-of-way shall not be utilized for any construction-related activity including, but not limited to, stockpiling of material, staging construction materials, and parking for workers or construction vehicles, unless the use of the right-of-way has been approved under a Utility Construction Permit.

14. A preconstruction meeting is required prior to the commencement of construction activities. At this meeting, the hours of work, access points, snow removal in the construction zone, traffic management and traffic control and construction and inspection schedules will be finalized.

15. The Applicant shall submit a Traffic Control Plan and Traffic Management Plan for review and approval by the County Engineer prior to the initiation of any construction-related activity. The items addressed in these plans should include, but are not limited to, traffic control devices/personnel, i.e. warning signs, flaggers, traffic control supervisors, etc., any specific delay times, adjacent neighboring property owner notifications, use and placement of any message boards, and similar items.

16. As part of any Traffic Control Plan, the Applicant shall identify all proposed access points for ingress/egress to the project from County rights-of-way. Where possible, the Applicant should utilize existing roads, driveways and other access points. The Applicant will be required to submit a schedule of construction traffic detailing information that should include, but not be limited to, the amount of traffic trips generated during construction of the proposed facilities, type of equipment/vehicles accessing the County Road, anticipated haul routes, period of time (i.e. "x" number of days, weeks) it will take to bring in any and all equipment for construction of the proposed facilities, placement of excess haul material, and the like.

17. Heavy equipment traffic will be subject to any and all weight limit restrictions along adjacent roadways, and the Applicant will be responsible for repair of the adjacent roads should there be any damage as identified by the County Engineer. If necessary, the Applicant will need to obtain Oversize/Overweight Permits from the appropriate jurisdictions.

18. The Applicant should note that any construction within the rights-of-way or damage to the rights-of-way resulting from construction activities related to this project will require restoration to the pre-construction conditions. The pre-construction conditions shall be documented by photograph or video and submitted to the County Transportation Department. If photographic documentation of pre-existing conditions is not provided, restoration will be to the level specified by the County Engineer. Furthermore, any disturbance of the actual paved portion of the roadway, including the shoulders, will require a full-width overlay. Road closures should be avoided where possible and the Applicant will be required to provide emergency vehicle and residential access to adjacent properties at all times.

19. All crossings of paved roadways shall be bored beneath the roadway surface. Any proposed road crossings by open cut shall flow fill to a depth of 2-feet of the surface.

20. When crossing or encroaching into Boulder County rights-of-way, all existing utilities shall be identified, which will include the depth of each utility, type of utility, and proximity of proposed construction to all existing utilities. The Applicant will be required to locate, identify and show all existing utilities in the Boulder County rights-of-way.

Project Coordination and Oversight:

21. The Applicant will be required to fund a project overseer, retained by the County, to monitor and inspect the project and ensure compliance with permit conditions and county requirements. This overseer must be both independent of the primary construction contractor and project engineer and have the authority to alter, direct and/or stop any activity that will result in adverse environmental or safety conditions or violates the conditions of the permit, County approval, or accepted construction standards. The project overseer shall not exercise its authority arbitrarily, and, prior to ordering any work stoppage, shall consult with the Applicant's construction manager in an attempt to obtain corrective action. The Applicant may request that the Land Use Director, in consultation with applicable County departments, review any work stoppage ordered by the project overseer.

The project overseer/inspector shall provide reports to the Land Use and Transportation Department on a weekly basis during construction activity. Weekly reports shall consist of a diary of observations throughout the construction process and progress.

22. In Addition, the Applicant shall fund an individual retained by the Boulder County Parks and Open Space Department (POS), to represent the County as landowner during construction and reclamation on County open space lands (including fee-owned, conservation easement-encumbered, trail easement areas, etc.) to ensure that the Applicant addresses any construction and reclamation issues promptly and adequately to the County's satisfaction.

Natural Resource, Land, Wildlife, and Agricultural Protection:

23. The Applicant shall route the pipeline within or along road rights-of-way in areas where the County open space lands have critical wildlife habitat, agricultural lands of high productivity, or other important characteristics identified by the County that may be compromised by pipeline construction. The Applicant shall work cooperatively with the Parks and Open Space and Transportation Departments to route the pipeline through any affected County open space properties in such a way as to minimize impacts to those properties.

24. The Applicant shall use cutoff trenches and cutoff walls wherever the pipeline will cross under or near any water, such as any irrigation ditch, stream, river, wetland, pond or other water body.

25. The Applicant shall design construction windows and plan construction schedules around sensitive times for agricultural and open space lands. For example:
    a. Work on County agricultural open space lands should only occur from September to the following mid-late March to minimize impacts on crops and the growing season. The Applicant shall notify POS each year before August regarding which properties the Applicant will be working on during that year's September-to-March window. This will enable POS to alert agricultural lessees before they make fall and winter investments in those properties. (For example, POS will need to notify dry land farmers not to plant winter wheat in August and September in areas that will be affected by the Applicant's activities.) This will also give POS the opportunity to provide the Applicant with any necessary, specific requirements to protect and restore the affected properties.
    b. Work on ecologically important lands should likewise only occur between September and the following mid-late March. This will give POS the opportunity to provide the Applicant with specific requirements to protect and restore the affected properties.
    c. Work should also only occur outside of nesting and migratory bird seasons, e.g., the osprey platform on the

south side of Lagerman Reservoir (if that route is approved) should only occur during the window from September 1st to March 14th, and work at the Lohr and Bragg-Spangler properties should only occur during the window from July 16th to May 14th.

26. The Applicant shall meet these general requirements from POS on County lands:
    a. The Applicant shall follow specific POS requirements for restoring agricultural lands and ecologically valuable lands, which have separate protocols. General guidelines are attached as Exhibit A to this Resolution. POS staff will provide specific requirements for specific properties when the Applicant's site-specific planning is underway. Specific requirements may include, but may not necessarily be limited to, seed mix requirements appropriate for restoring the affected properties, if POS deems that necessary.
    b. The Applicant shall obtain POS approval for reclamation and restoration procedures for all affected County open space properties. The Applicant shall also allow for POS oversight of the Applicant's maintenance and weed control activities following reclamation and restoration.
    c. The Applicant shall pay POS for damages if restoration work does not restore the affected properties to their original conditions (or better) within a period of time acceptable to POS, in its sole discretion.
    d. The foregoing requirements (a-c) shall be incorporated into any new easements the Applicant may need across any County open space lands to be affected by the pipeline, and the Applicant shall compensate the County for those easements.

27. The Applicant shall provide POS with up-to-date GIS shapefiles showing the proposed full length of the pipeline route from the north Boulder County line to the terminus of the pipeline and along the eastern portion of the pipeline before beginning negotiations with POS about easements across County open space properties, and at regular intervals during negotiations to keep POS informed of the intended specific pipeline route through County open space properties. The data shall show existing easement lengths and widths, as well as new temporary and permanent easements needed and their respective widths. The County's granting of new easements over County open space, including through private properties covered by County-held conservation easements, shall be contingent upon compensation to POS and shall be subject to property-specific conditions to minimize damages and produce prompt restoration.

28. The Applicant shall work with the Boulder County Parks and Open Space Department on the timing, location, and phasing of construction of sections of the pipeline that coincide with the trail corridors shown in the approved Lagerman-Imel-AHI Open Space Complex Management Plan. In general, these sections are located between Nelson Road and Oxford Road. Since the timing of pipeline construction is unknown, if the trail is constructed prior to installation of the pipeline, the Applicant shall replace the trail to the same or better pre-installation conditions following pipeline installation. If the pipeline is constructed before the trail is constructed, the Applicant shall make every effort possible to construct the pipeline within these corridors and then shall build the trail on top of the pipeline. The Applicant shall construct or reconstruct these trail sections to the Parks and Open Space Department's specifications and satisfaction.

29. In order to ensure existing and new active raptor nests are not disturbed, raptor surveys shall be conducted prior to construction and recommended seasonal and spatial buffer zones shall be established and maintained.

30. Black tailed prairie dog colonies exist throughout Boulder County. If the route requires construction through prairie dog colonies, the prairie dogs should either be: (1) passively relocated or dispersed (i.e., temporarily removed from the construction zone by fencing, barriers, or other appropriate measures, so that the prairie dogs may return to their original habitat when construction/reclamation is concluded), with this option being acceptable so long as prairie dogs are not temporarily dispersed into new territory/habitat; (2) permanently moved to another location alive; or (3) humanely euthanized before onset of construction. A permit must be obtained from the Colorado Division of Wildlife prior to implementation of any trap/transplant effort. Burrowing owl surveys are required if destruction or poisoning of prairie dog burrows will occur between March 15 and October 31 of any year.

31. The removal of large mature trees shall be avoided, and other trees removed in construction shall be replaced at a 3 to 1 level. A tree removal and replacement plan shall be provided with the 90% construction drawings: this plan shall be reviewed and approved by the Land Use Department prior to any construction activities.

32. A reclamation plan shall be developed on a site- specific basis so that lands disturbed by the construction of the pipeline shall be fully restored to pre-construction

conditions. The reclamation plan shall include a description of the current condition of the lands to be disturbed sufficient to enable an assessment of adequate post-project restoration. Documentation of pre-disturbance conditions for agricultural lands shall include a detailed description of the agricultural operations/practices, irrigation and drainage systems, soil composition and profiles, and any other features pertinent to agricultural productivity. The Specifications for Soil Handling and Reclamation provided by Parks and Open Space for County properties (see Exhibit A to this Resolution) may be used for guidance on private properties, in addition to the Sample Reclamation Plan in the application materials; however, the final plan should reflect the unique nature of the individual property and the goals of the property owner.

Invasive Species:

33. If heavy equipment to be used for the project has previously been used in another stream, river, lake, reservoir, pond, or wetland, appropriate disinfection practices are necessary prior to construction to prevent the spread of New Zealand mud snails, zebra mussels, quagga mussels, whirling disease, and any other aquatic invasive species into the drainage. These practices are also necessary after project completion, prior to this equipment being used in another stream, river, lake, reservoir, pond, or wetland.

34. The application materials describe the plan for preventing the spread of noxious weed species. The Applicant shall work with Boulder County's weed specialist when developing and implementing any containment or revegetation work to ensure that noxious weeds do not spread from the project site, or become established in areas disturbed by construction.

A motion to approve the Docket (#SI-11-0001), subject to the conditions stated above, was made by Commissioner Toor, seconded by Commissioner Gardner, and passed by a 3-0 vote of the Board.

Adopted as a final decision of the Board on this 12th day of July, 2012.

BOARD OF COUNTY COMMISSIONERS OF THE COUNTY OF BOULDER

Cindy Domenico, Chair

Will Toor, Vice Chair

Deb Gardner, Commissioner

ATTEST:

Clerk to the Board

Boulder County

Parks and Open Space

5201 St. Vrain Road • Longmont, Colorado 80503
303.678.6200 • Fax: 303.678 6177 • www.bouldercounty.org

EXHIBIT
A
Resolution 2012-70

Reclamation

Of primary concern to the Parks & Open Space Department is the long-term impact of the project on the composition and productivity of the plant community within the chosen pipeline alignment. Parks & Open Space has reviewed the Reclamation section of the 1041 permit application (pages 11-14 of Attachment 2-1041 Application Addendum, dated August 2011) and appreciates NCWCD's recognition of these impacts and willingness to reclaim and revegetate the site to its pre-existing condition. In particular, Parks & Open Space supports the following terms as committed to by NCWCD and outlined in the application:

1. Hiring an independent revegetation contractor that will be involved in project planning, construction meetings, revegetation efforts, and remedial actions.

2. Preparing and following a site specific revegetation/reclamation plan that is prepared with the help of and receives final approval of the relevant property owner.

3. Commitment to taking necessary remedial actions following construction and reclamation to the satisfaction of the landowner

Parks & Open Space also generally supports the "Sample Reclamation Plan", which is provided in the 1041 application. This plan would need to be completed for each County-owned property managed by the department and approved by the Parks & Open Space Department. Each site will have its own unique pre-existing conditions including plant species composition, soil types and conditions, water management and infrastructure, and land uses, and each will have its own unique reclamation needs and desired post-reclamation conditions. At the appropriate time following project approval, Parks & Open Space is willing to work with NCWCD and their revegetation contractor on preparation of these site-specific reclamation plans.

Attached we provide some general specifications for reclamation/revegetation that will be required on all County-owned land. These specifications may also be applicable to other lands within the pipeline corridor. Please note site-specific reclamation details will be worked out in the above mentioned site-specific reclamation plans.

Specifications for Soil Handling and Reclamation
On Boulder County Parks & Open Space Properties
Including Irrigated Cropland, Dryland Cropland, and Rangeland

For the Northern Colorado Water Conservancy District's
Southern Water Supply Project II

October 2011

This document addresses procedures for soil handling and reclamation following any impacts of the Northern Colorado Water Conservancy District's Southern Water Supply Project II. The specifications are requirements for work on Boulder County Parks & Open Space properties, but may also be adopted for private properties within the project alignment.

The following procedures are general and provide the minimum requirements for reclamation. Specific reclamation procedures shall be developed in site-specific Reclamation Plans completed for each property within the approved alignment. The Reclamation Plans will be prepared in conjunction with and approved by Parks & Open Space.

The following procedures can be summarized into the following categories:

1. Topsoil Removal and Storage
2. Backfilling, Grading, and Ripping
3. Relieving Compaction
4. Topsoil Redistribution
5. Seedbed Preparation
6. Seeding
7. Mulch
8. Post- Reclamation Weed Control
9. Timeframe and Success of Reclamation

An Inspection Personnel funded by NCWCD and hired by Boulder County will oversee and be involved with the entire reclamation process.

To ensure compliance with all reclamation requirements, a pre-construction meeting will be held with the contractor prior to each phase of the project.

Before any construction activities proceed, the construction area should be delineated with a temporary, orange construction fence on the boundary between the construction easement and remaining Parks and Open Space land, and silt fencing to serve as a visual reference for the construction area. All traffic and construction activity shall be restricted to within the easement area only. Areas impacted outside of the easement area shall be restored to the Inspection Personnel's specifications. The orange construction fence and silt fence shall remain until the project is finished.

1.0 Topsoil Removal

After the construction area and its access have been delineated, the vegetation should be mowed to a maximum height of 4 inches over the area to be disturbed. If the amount of vegetation exceeds what can be incorporated into the soil without interfering with establishing a proper seedbed, then excess vegetation shall be removed.

Topsoil should be removed by a front-end loader (preferred method) or grader. **Under no circumstances should topsoil be removed under wet soil moisture conditions.** The County's Inspection Personnel can provide assistance in determining topsoil depth and proper removal. The depth of the topsoil layer may vary. Topsoil may be delineated from the subsoil by a higher organic matter content (usually, but not always, indicated by a darker color) **and** a relatively loose and friable soil structure. The Inspection Personnel should be present at the site as topsoil removal is initiated to determine average topsoil depth. Typically, topsoil is between 4 and 8 inches in depth. Topsoil should be placed to one side of the construction area and demarcated with a silt fence to avoid impacts.

Any subsoil removed should be placed separate from the topsoil. **Under no circumstances shall subsoil be mixed with topsoil, and subsoil shall not be placed on top of the topsoil.** The topsoil shall be protected from contamination by subsoil material, weeds, etc. and from compaction by construction equipment and vehicles.

2.0 Backfilling and Grading

Contractor shall replace backfill material as close as possible to the depth from which it was removed. Compaction of the backfill must prevent settling that will cause the profile of the disturbed areas to be significantly lower than the grade of undisturbed adjacent land. Also, overall compaction of the top 24" of the disturbed area should not be restrictive to root growth of plants.

3.0 Relieving Compaction

Following compaction of the backfill, the Inspection Personnel will determine if ripping and chiseling is necessary to relieve soil compaction in the root zone to accommodate root growth and soil water storage capacity. If it is deemed necessary, the contractor must rip and chisel the soil to relieve compaction. Contractor must rip the entire length of the pipeline that is compacted to a minimum depth of 18 inches (deeper is desirable) with no more than 20 inches between ripped intervals. Contractor shall follow ripping with chiseling to a minimum depth of 12 inches, with no more than 10 inches between chiseled intervals. At this point, depending upon the size of soil clods left after ripping, discing, culti-packing or other operations may be required to reduce the size of the clods. Contractor shall consult with the Inspection Personnel to inspect the site at this time to make that determination.

Final grading of areas that are irrigable cropland is of particular importance. The overall grade of land to be irrigated must provide for uniform coverage by flood irrigation.

4.0 Redistribution of Topsoil and Application of Amendments

The salvaged topsoil should be redistributed uniformly over the disturbed areas, minimizing compaction by equipment. **Topsoil redistribution shall not occur under wet soil conditions.** If topsoil is contaminated, compacted or otherwise improperly handled, topsoil should be amended with compost at a rate of 3 cubic yards per 1000 square feet of disturbed area to provide a suitable seedbed. Compost shall consist of at least 40 % organic matter, with a pH not to exceed 8.0, and soluble salts not greater than 10 Mmhos/cm. The carbon to nitrogen ratio of the compost shall be between 10:1 and 20:1. Compost shall be incorporated evenly throughout topsoil.

5.0 Seedbed Preparation

Following redistribution of topsoil and application of amendment, the disturbed areas shall be chiseled again to a minimum depth of 10 inches, with no more than a 10 inch interval between chiseled furrows.

On disturbed areas, further seedbed preparation such as discing, harrowing and/or firming operations will be necessary to reduce soil clods that are greater than 4 inches in diameter, and to provide a seedbed that is firm and friable.

Irrigated and Dryland Cropland

On cropland, final grading and seedbed preparation will be performed by the agricultural tenant on the property. NCWCD shall reimburse the tenant at a negotiated hourly rate to cover equipment and operator time. Reimbursement shall be made upon presentation of an invoice to NCWCD by the agricultural tenant.

6.0 Seeding

Irrigated and Dryland Cropland

The agricultural tenant will perform seeding operations on irrigated and dryland cropland. NCWCD shall reimburse tenant for any seed that has been planted prior to disturbance by NCWCD's construction activities and for seeding operations at a negotiated hourly rate. All other seed on cropland will be provided by Boulder County or tenant. Reimbursements for seeding operations shall be made upon presentation of an invoice to NCWCD by the agricultural tenant.

Rangeland

Seed mix and planting rates for rangelands will vary amongst sites. An example seed mix and planting rate specification are provided below. Seed should be provided by NCWCD or its contractor according to specifications for each property. Each bag of seed must have its original seed tag attached at the time of delivery and should remain attached until the seed is used. All seed tags must be saved and provided to the Inspection Personnel.

Seed shall be drilled with a drill that is capable of placing the specified seed at the specified rate, at a ½" - 3/4" depth. The drill should have an 8" or less drill row spacing and be equipped with packer wheels to firm the soil over the drill row. Dragging chains behind the drill to cover seed is not an acceptable substitute. **Seed drills must be clean of seed from previous seeding jobs prior to any seeding on County-owned lands.**

Seeding should be completed between October 1 and March 31. In between these dates a cover crop may be used, until the appropriate time to seed specified mix. Seeding shall not occur in extremely windy conditions, or when the soil is frozen or wet.

Areas that cannot be drilled may be broadcast seeded. Hydroseeding is not acceptable. The specified seeding rate in these areas shall be doubled. Broadcast seed shall be raked, harrowed or otherwise-covered by soil to a depth of 1/2" to 3/4".

Example Rangeland Seed Mix

Species	Common Name – Variety	PLS/ Acre
Bouteloua gracilis	Blue grama, Native	0.48
Bouteloua curtipendula	Sideoats grama, Vaughn	2.33
Buchloe dactyloides	Buffalograss, Native	3.73
Elymus trachycaulus	Slender wheatgrass, Pryor	4.11
Pascropyrum smithii	Western wheatgrass, Arriba	8.32
Stipa viridula	Green Needlegrass, Lodorm	2.31
Total PLS/Acre		**21.27**

PLS lb/ac = Pure Live Seed pounds per acre

7.0 Mulch

Irrigated and Dryland Cropland

Mulching is not necessary on irrigated or dryland cropland.

Rangeland

After seeding has been completed, mulch should be applied within 24 hours after seeding to all rangeland seeded areas to protect the seed and conserve soil moisture, which will aid in seedling germination and establishment. The following types of mulch are recommended for 3:1 slopes or flatter. Slopes steeper than 3:1 will need additional erosion control.

A. Colorado Certified Weed Free Hay or Straw Mulch: Applied evenly at a rate of 3000 to 4000 lbs. per acre over the seeded areas. Hay or straw may be crimped in or sprayed with a tackifier according to the project plans. Guara gum tackifier is recommended.

B. Wood fiber hydromulch with guara gum tackifier: A standard rate of 2000 lbs. per acre of hydromulch and 80 lbs. per acre of guara gum tackifier will be appropriate for most projects unless otherwise specified on the project plans. The operator shall spray apply the slurry of wood fiber mulch according to the manufacture's specifications in a uniform manner over the designated seeded areas. **Seed shall not be incorporated and applied simultaneously with the hydromulch slurry.**

8.0 Post-Reclamation Weed Control

To prevent damage to young seedlings, no herbicides will be used through the first growing season following seeding. Reclaimed areas with slopes not exceeding 3:1 will be mowed to prevent flowering and weed seed development. Hand methods will be implemented on steep slopes. Mowing will be undertaken no more than twice during each growing season to prevent desiccation of the grass seedlings with an ideal mowing height of 6 to 8 inches.

9.0 Timeframe and Success of Reclamation

Irrigated and Dryland Cropland

The reclamation success of irrigated and dryland croplands largely depends on the soil condition post-reclamation and is determined by the level of productivity of the crop grown within reclaimed area versus the crop productivity within surrounding undisturbed areas. If the site is properly reclaimed, then reclamation success should occur in year-1 or 2 following reclamation.

Each year the site will be reviewed by Parks & Open Space's Resource Management and/or Agricultural Staff, at which time NCWCD will be advised as to the management practices that are expected to ensure reclamation success. If within that time period the reclamation process is deemed successful by Parks & Open Space, the obligation incurred by the responsible party will be released. Reclamation success is defined by the level of crop productivity compared to surrounding undisturbed locations. Reclamation will be considered a success if the difference in productivity between disturbed and undisturbed locations is less than 10%.

Rangeland

Reclamation with native and some non-native species requires three to five years to determine stand establishment and productivity. It should be expected that early successional species (such as summer and winter annuals) will occupy the area before the desired perennial stand dominates.

Each year the site will be reviewed by Parks & Open Space's Resource Management and/or Agricultural Staff, at which time NCWCD will be advised as to the management practices that are expected to ensure reclamation success. If within that time period the reclamation process is deemed successful by Parks & Open Space, the obligation incurred by the responsible party will be released. Reclamation success is defined by the percentage of desired species compared to weedy annual broadleaf species (which usually requires no less than three years). Reclamation will be considered a success if there is 75% cover of the desired species present.