



Katie Beilby <beilbykm@co.larimer.co.us>

Fwd: NISP 1041 Conditions

Rob Helmick <helmicrp@co.larimer.co.us>
To: Katie Beilby <beilbykm@co.larimer.co.us>

Wed, Jun 24, 2020 at 2:03 PM

conditions from northern

----- Forwarded message -----

From: **Stephanie Cecil** <scecil@northernwater.org>
Date: Tue, Jun 23, 2020 at 12:20 PM
Subject: NISP 1041 Conditions
To: Lesli Ellis <ellislk@co.larimer.co.us>
Cc: Christie Coleman <ccoleman@northernwater.org>, Rob Helmick <helmicrp@co.larimer.co.us>

Lesli,

As discussed last week, we do plan on touching on a few conditions with some recommended minor wording changes. This is from our presentation and includes the two conditions:

Condition: Prior to construction, secure written confirmation from all affected irrigation companies that are impacted by this project by reservoir or pipelines.

There is no guarantee that each irrigation company will provide a written response.

Recommended condition: The applicant shall demonstrate that it has contacted all affected irrigation companies.

Condition: Pipeline alignment alterations greater than 50 feet must be evaluated by Larimer County and may be subject to reconsideration by the BOCC. All alignment changes on private property shall include approval of the landowner.

The Larimer County Land Use Code 14.13 has requirements for technical revisions or 1041 amendments that would need to go back in front of the BOCC.

Recommended condition: Alterations greater than 100 feet or that move within 100 feet of an existing structure must be evaluated by Larimer County staff. Alignment changes on private property shall be coordinated with the landowner in addition to staff review.

Thanks!

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MEMORANDUM



Date: June 12, 2020

To: Larimer County Planning Department

From: Randy Parks – Dewberry, Michael Gossett and Madeleine Harris - HDR

Subject: Northern Integrated Supply Project – Construction Approach in Residential Areas
– Revised June 2020

Overview

Due to the proximity of the Northern Tier alignment to Eagle Lake Subdivision, County Road 52 and Bold Venture Way/Grey Rock Drive, the design team developed a preliminary approach to construction access and estimated construction duration so that the impacts to the residents in these areas and the traveling public could be better understood. The alignment was broken into several segments in each area in order to optimize analysis and construction traffic routing.

Construction Phasing

Construction phases throughout the different segments will be overlapping, not additive nor independent of each other. There are three major phases of construction, defined as follows:

Clearing/Site Prep/SWMP- This is a relatively light construction phase. This phase mainly involves preparing the area for installation. This includes removing vegetation/roots that are in the pipeline easement and stockpiling/protecting topsoil. It also includes other site prep work, including setting up signage, assembling equipment, and materials. Finally, this phase includes preparing the site for stormwater management, which could include installation of silt fences, or other best management practices to prevent erosion caused by stormwater drainage. This phase of construction requires small to medium-duty construction vehicles. There may also be larger delivery trucks who occasionally arrive to drop off pipe in preparation for construction.

Pipe Installation- This is the most significant phase of construction and includes digging the trench for the pipeline, laying the pipeline in the trench, welding joints as needed, backfilling the trench and compacting the area as needed. This construction phase will require larger tracked excavators, front-end loaders, dump trucks and stock-piling of materials to complete the work. Speed limits will be set for the delivery and construction vehicles of 10-15 mph to ensure safety of the site.

Restoration and Reclamation- This is also a relatively light construction phase. This phase mainly includes restoring the construction area to conditions prior to construction. This includes re-seeding as needed, and other restoration efforts. It will consist of small agricultural tractors and pick-up trucks. This phase is typically not consecutive like the other phases as the contractor will usually coordinate restoration/reclamation as needed as pipe installation progresses.

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Individual Homeowner Impacts

A homeowner whose property is along the construction path will not experience construction on their property for the entire overall construction duration for that area. For example, a homeowner with a 500' stretch of their property abutting the alignment might expect about one week of clearing/site prep/SWMP, about one week of pipeline installation, and about one week of restoration/reclamation. In total, the 500' stretch will likely only see heavy activity for around 3 weeks. This work may be spaced out depending on weather, soil conditions, detailed reclamation plans and appurtenance requirements.

See Figure 1 below for a timeline and intensity of work diagram with photos of each construction phase activity a typical homeowner might experience.

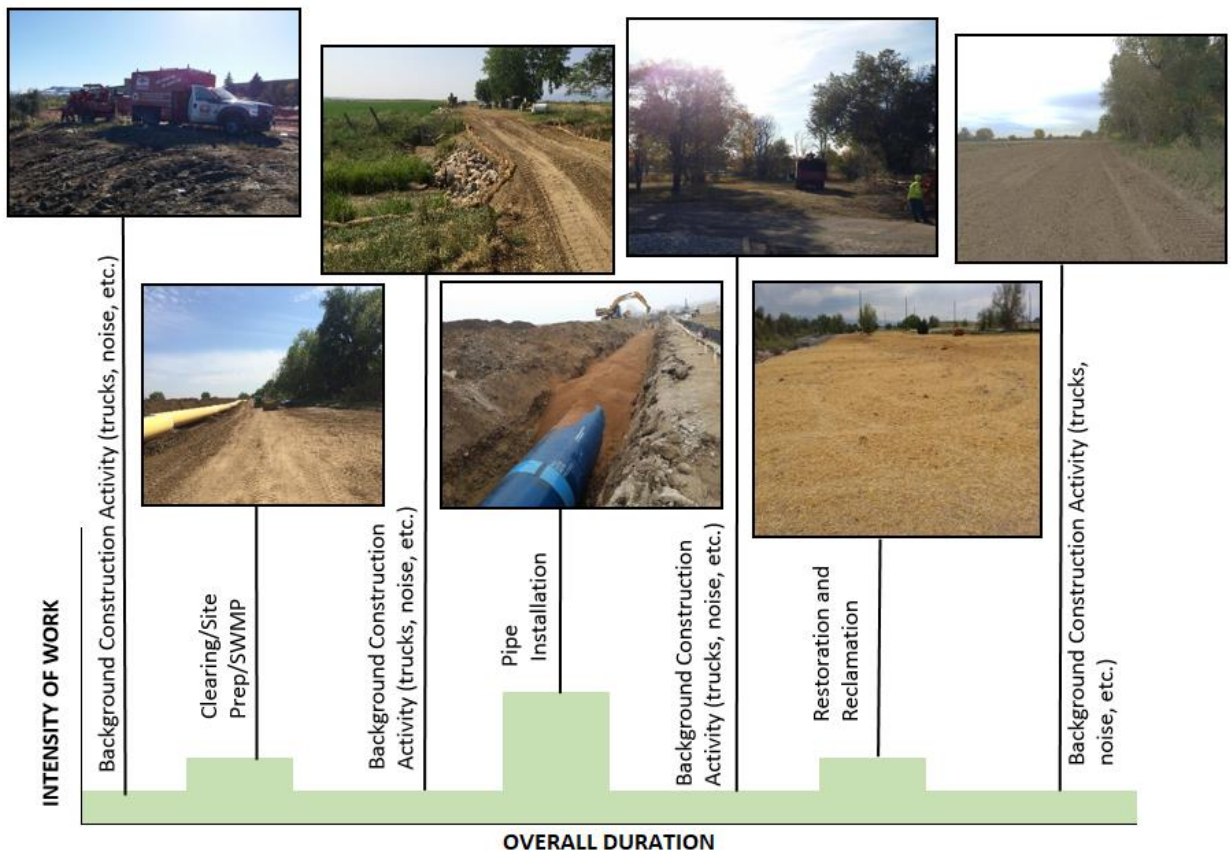


Figure 1: Typical Levels of Activity throughout Construction Duration

Eagle Lake Subdivision

The scope of analysis and segments through Eagle Lake Subdivision are shown in Figure 2 below. The alignment through this area was broken into five segments.

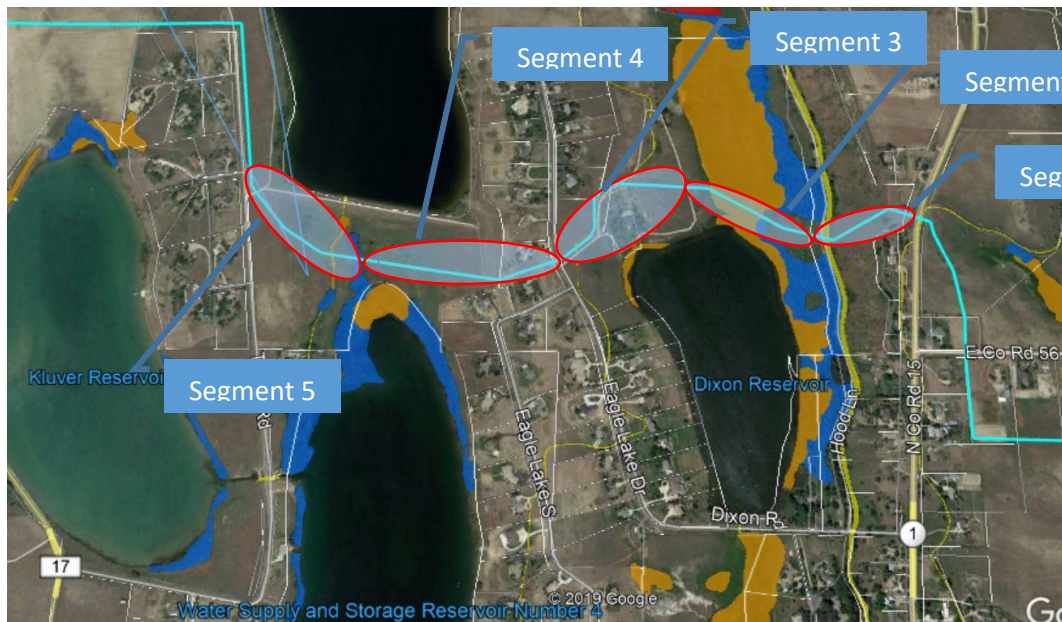


Figure 2: Scope of analysis and segments through Eagle Lake Subdivision

Overall Construction Duration

Construction through the five segments will be overlapping, not additive nor independent of each other. In total, estimated duration of construction through this area is around 14 weeks.

A proposed comprehensive timeline for construction throughout all five segments (approx. 6,000' in total) is displayed in Figure 3. The three major phases of construction are also indicated in the figure.

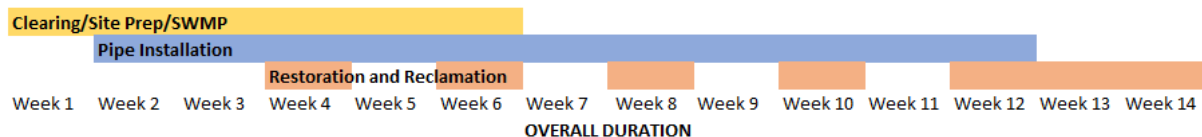


Figure 3: Overlapping construction timeline and phases

As illustrated in Figure 3 above, the estimated durations for each construction phase through the entire Eagle Lake area are as follows:

1. Clearing/Site Prep/SWMP – 6 weeks

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2. Pipe Installation for All Segments – 7-11 weeks
3. Restoration and Reclamation – 7 weeks

Construction Duration and Access by Segment

Construction access will be specified by individual segments indicated in Figure 2. Specifying construction access points for each segment will ensure that the least amount of disruption to homeowners and private roadways is maintained. Construction access will be coordinated with individual landowners and the pipeline contractor. Access is subject to change.

Construction activities throughout all segments will occur concurrently to expedite the overall process. Approximate durations of impact provided below for each segment will be overlapping, and should not be summed for a total duration of impact.

Segment 1 – Highway 1 to Hood Lane. Construction and material delivery vehicles will access the alignment via the alignment as it connects to Highway 1. In most cases entering via Highway 1 and exiting via Hood Lane. This segment is approximately 800 feet in length. In total it is anticipated that this area will be impacted for approximately 4 weeks. Since Highway 1 is a paved and highly-trafficked road, construction across Highway 1 will consist of trenchless methods so traffic on that roadway will not be restricted by construction activity. Since Hood Lane is a semi-private gravel road, the pipeline across Hood Lane will be installed with an open cut method. However, homeowner access will be maintained at all times with temporary detours. The road will be returned to current conditions, so only temporary impacts to the roadway are expected.

Segment 2 – Wetlands North of Dixon Reservoir. Construction and material delivery vehicles will access the alignment via the alignment, Hood Lane and Eagle Lake Drive. In most cases entering via Hood Lane and Exiting via Eagle Lake Drive. This will require access to the Eagle Lake Subdivision via the gated entrance at Eagle Lake Drive and Highway 1. This segment is approximately 1,100 feet in length. In total it is anticipated that this area will be impacted for approximately 4 weeks. Because of the presence of wetlands in this segment, construction traffic will not access the alignment via Hood Lane once construction and restoration of this segment is completed. Unless otherwise requested by the County, it is proposed that the Contractor not be allowed to use Eagle Lake Court for construction access.

Segment 3 – Private Property East of Eagle Lake Drive (TIPS COREY ALLEN/KAREN KRISTIN). Construction and material delivery vehicles will access the alignment via Eagle Lake Drive and will use Eagle Lake Drive to both enter and exit the site. This will require access to the Eagle Lake Subdivision via the gated entrance at Eagle Lake Drive and Highway 1. It is anticipated that sufficient temporary easement will be obtained from TIPS COREY ALLEN/KAREN KRISTIN to allow construction vehicles to turn around at the eastern end of this segment and exit the same way they came in. This segment is approximately 1,500 feet in length. In total it is anticipated that this area will be impacted for approximately 5 weeks. Unless otherwise requested by the County, it is proposed that the Contractor not be allowed to use Eagle Lake Court for construction access. The pipeline across Eagle Lake Drive will be crossed using trenchless methods so residential traffic using Eagle Lake Drive will not be restricted.

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Segment 4 – Private Property west of Eagle Lake Drive to drainage between Water Supply and Storage Reservoirs 3 and 4. Construction and material delivery vehicles will access the alignment via the Eagle Lake Drive both for construction traffic entering and exiting the site. This will require access to the Eagle Lake Subdivision via the gated entrance at Eagle Lake Drive and Highway 1. It is anticipated that sufficient temporary easement will be obtained from the Water Supply and Storage Company to allow construction vehicles to turn around at the eastern end of the wetland that connects the two reservoirs. This segment is approximately 1,500 feet in length. In total it is anticipated that this area will be impacted for approximately 5 weeks. Unless otherwise requested by the County, it is proposed that the Contractor not be allowed to use Eagle Lake Court for construction access. Because of the presence of wetlands in this segment, construction traffic will not access the alignment via Eagle Lake Drive once construction and restoration of this segment is completed.

Segment 5 – Private Property east of Travis Road to drainage between Water Supply and Storage Reservoirs 3 and 4. Construction and material delivery vehicles will access the alignment via Travis Road and will use Travis Road to both enter and exit the site. It is anticipated that sufficient temporary easement will be obtained from the Water Supply and Storage Company to allow construction vehicles to turn around at the western end of the wetland that connects the two reservoirs. This segment is approximately 1,100 feet in length. In total it is anticipated that this area will be impacted for approximately 4 weeks.

County Road 52

The scope of analysis and segments near County Road 52 are shown in Figure 4 on the next page. The alignment through this area was broken into seven segments.

Overall Construction Duration

Construction throughout the seven segments will be overlapping, not additive nor independent of each other. In total, estimated duration of construction through this area is around 20 weeks.

A proposed comprehensive timeline for construction throughout all seven segments (approx. 12,500' in total) is displayed in Figure 5 on the next page. The three major phases of construction are indicated in the figure.

As illustrated in Figure 5 on the following page, the estimated durations for each construction phase through the County Road 52 area are as follows:

1. Clearing/Site Prep/SWMP – 9 weeks
2. Pipe Installation for All Segments – 15-17 weeks
3. Restoration and Reclamation – 10 weeks

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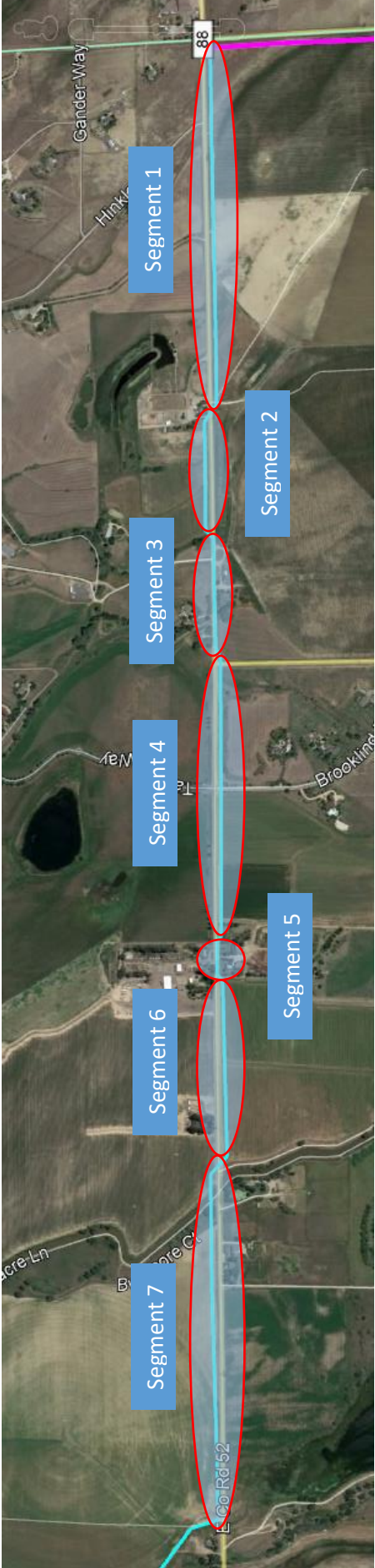


Figure 4: Scope of analysis and segments near CR 52

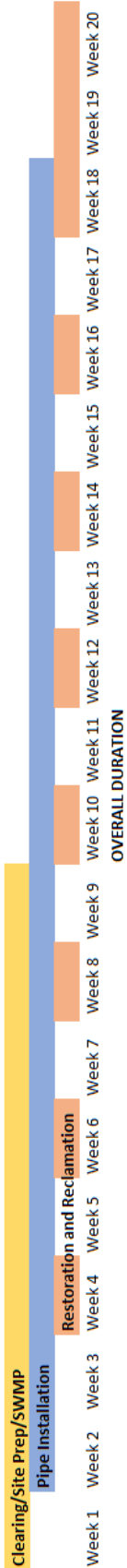


Figure 5: Overlapping construction timeline and phases for entire duration

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Construction Duration and Access by Segment

Construction access will be specified by individual segments, as identified in Figure 4. Specifying construction access points for each segment will ensure that the least amount of disruption to homeowners and private roadways is maintained. Construction access will be coordinated with individual landowners and the pipeline contractor. Access is subject to change.

Construction activities throughout all segments will occur concurrently to expedite the overall process. Approximate durations of impact provided below for each segment will be overlapping, and should not be summed for a total duration of impact.

Segment 1 – From intersection with the County Line Pipeline on the west side of County Road 1 to the point where the alignment crosses CR 52 from the south of the road to the north. Construction and materials delivery vehicles will access the alignment via CR 52. In most cases, the vehicles will enter along CR 1 from the north, and exit along CR 3 to the south. This segment is approximately 3,100 feet in length. In total, it is anticipated that this area will be impacted for approximately 6 weeks. The alignment is south of CR 52 for the majority of the segment. The pipeline does cross CR 52 from the south side of the road to the north side of the road at the end of the segment. Since CR 52 is a gravel road in this area, the pipeline across County Road 52 will be installed with an open cut method. However, only one lane at a time will be closed and flaggers will be on site so traffic will not be restricted. The road will be restored to current conditions, so only temporary impacts to the roadway are expected.

Segment 2 – From the end of Segment 1, where the pipeline crossed to the north side of CR 52, through to the point where the alignment enters the CR 52 ROW. Construction and materials delivery vehicles will access the alignment via CR 52. In most cases, the vehicles will enter along CR 1 from the north, and exit along CR 3 to the south. This segment is approximately 1,000 feet in length. In total, it is anticipated that this area will be impacted for approximately 4 weeks. The alignment is north of CR 52 for the majority of the segment. The pipeline does cross into CR 52 ROW from the north side of the road at the end of the segment. The pipeline is shown in the ROW in this section to avoid impacts to residences in the area and avoid drainage ponds to the south. Since CR 52 is a gravel road in this area, the pipeline within County Road 52 will be installed with an open cut method. However, homeowner access will be maintained at all times with temporary detours.

Segment 3 – Includes the portion where the alignment is within the CR 52 until it crosses back to the south of CR 52, right before crossing CR 3. Construction and materials delivery vehicles will access the alignment via CR 52. In most cases, the vehicles will enter along CR 1 from the north, and exit along CR 3 to the south. This segment is approximately 950 feet in length. In total, it is anticipated that this area will be impacted for approximately 4 weeks. The alignment is within CR 52 ROW for most of the segment. The alignment is in the ROW in this area in order to minimize impacts to landowners and trees on either side of the road in this constricted area. Since CR 52 is a gravel road in this area, the pipeline within County Road 52 will be installed with an open cut method. However, homeowner access will be maintained at all times with temporary detours. The road will be restored to current conditions, so only temporary impacts to the roadway are expected.

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Segment 4 – Includes the stretch that crosses CR 3, and Brooklind Estates/Barry Lane and continues to parallel the south side of CR 52 until the point where the alignment pinches in closer to the road near residences along CR 52. Construction and materials delivery vehicles will access the alignment via CR 52. In most cases, the vehicles will enter along N Frontage Road from the north, and exit along CR 3 to the south. This segment is approximately 2,400 feet in length. In total, it is anticipated that this area will be impacted for approximately 5 weeks. The alignment is south of CR 52 for the majority of the segment. The pipeline does cross CR 3 at the east end of the segment. Since CR 3 is a gravel road in this area, the pipeline across County Road 52 will be installed with an open cut method. However, only one lane at a time will be closed and flaggers will be on site so traffic will not be restricted. The road will be restored to current conditions, so only temporary impacts to the roadway are expected. The segment also crosses Barry Lane/Brooklind Estates. This crossing will be a trenchless crossing at the road is paved in this location. Since the crossing will be trenchless, no roadway or traffic impacts are expected.

Segment 5 – Includes the stretch that is very close to CR 52 ROW before it jogs back further to the south of CR 52. Construction and materials delivery vehicles will access the alignment via CR 52. In most cases, the vehicles will enter along N Frontage Road from the north, and exit along CR 3 to the south. This segment is approximately 400 feet in length. In total, it is anticipated that this area will be impacted for approximately 5 weeks. The alignment will be constructed closer to the CR 52 roadway than other segments. This was done to minimize impacts to landowners and trees on either side of the road in this constricted area. Due to the close proximity of the alignment to the road for this small segment, construction staging will likely occur in one lane, but there will be no excavation in the roadway. Only one lane at a time will be closed for staging and flaggers will be on site so traffic will not be restricted. Access to residences in the area will be maintained at all times.

Segment 6 – Includes the stretch that is south of CR 52 through the point where the alignment crosses CR 52 to be on the north side again. Construction and materials delivery vehicles will access the alignment via CR 52. In most cases, the vehicles will enter along N Frontage Road from the north, and exit along CR 3 to the south. This segment is approximately 1,750' feet in total length including the crossing of CR 52. In total, it is anticipated that this area will be impacted for approximately 5 weeks. The alignment is south of CR 52 for the majority of the segment. The pipeline does cross CR 52 from the south side of the road to the north side of the road at the end of the segment. This crossing was included in order to avoid impacts to residences on the south side of the road and avoid a pond. Since CR 52 is a paved road in this area, the pipeline across County Road 52 will be installed with a trenchless method. Since the crossing will be trenchless, no roadway or traffic impacts are expected.

Segment 7 – Includes the portion that parallels the north side of CR 52 before the alignment heads north east of the golf course and includes the crossing of Broadacre Lane. Construction and materials delivery vehicles will access the alignment via CR 52. In most cases, the vehicles will enter along N Frontage Road from the north, and exit along CR 3 to the south. This segment is approximately 2,900 feet in length, including the crossing of Broadacre Lane. In total, it is anticipated that this area will be impacted for approximately 6 weeks. The alignment is north of CR 52 for the entire length of the segment. The pipeline does cross Broadacre Lane at the east end of the segment. Since Broadacre Lane appears to be a gravel residential drive, the pipeline across Broadacre Lane will be installed with an open cut method.

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However, homeowner access will be maintained at all times with temporary detours. The road will be restored to current conditions, so only temporary permanent impacts to the roadway are expected.

Bold Venture Way/Grey Rock Drive

The scope of analysis and segments near Bold Venture Way/Grey Rock Drive are shown in Figure 6 below. The alignment was broken into two segments.

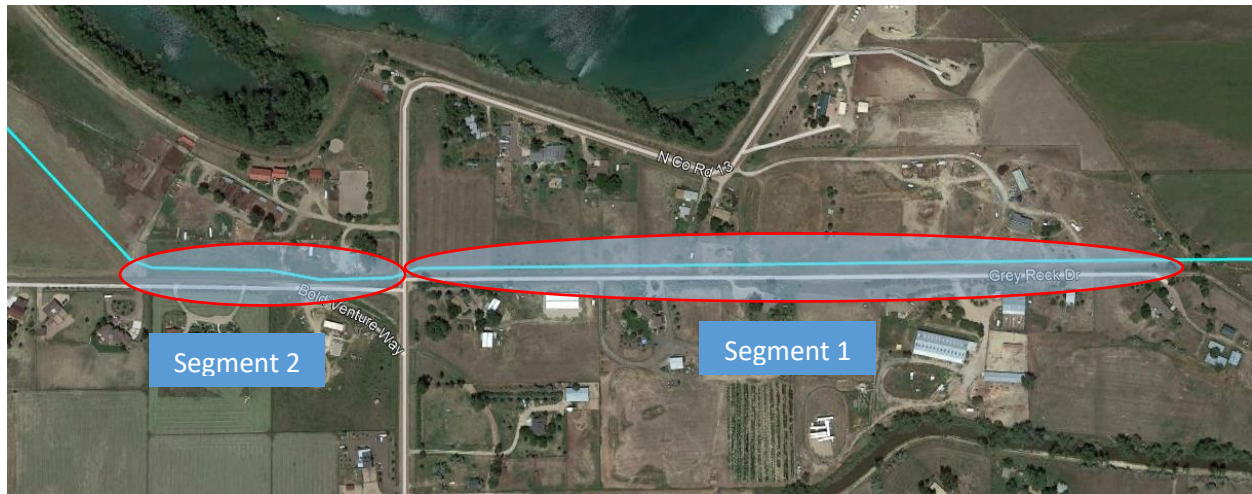


Figure 6: Scope of analysis and segments near Bold Venture Way and Grey Rock Drive

Overall Construction Duration

Construction throughout the two segments will be overlapping, not additive nor independent of each other. In total, estimated duration of construction through this area is around 10 weeks.

A proposed comprehensive timeline for construction throughout both segments (approx. 3,500' in total) is displayed in Figure 7. The three major phases of construction are indicated in the figure.

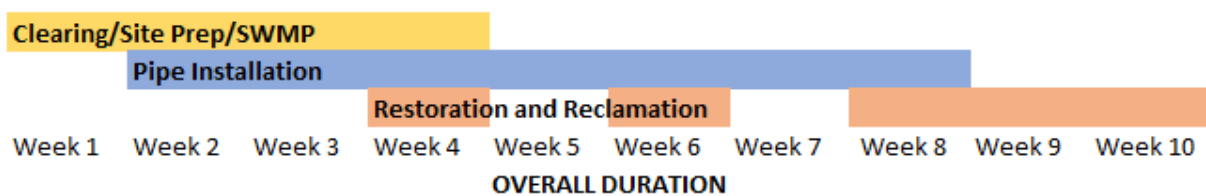


Figure 7: Overlapping construction timeline and phases

As illustrated in Figure 7 above, the estimated durations for each construction phase through Bold Venture Way/Grey Rock Drive area are as follows:

1. Clearing/Site Prep/SWMP – 4 weeks
2. Pipe Installation for All Segments – 5-7 weeks

3. Restoration and Reclamation – 5 weeks

Construction Duration/Access by Segment

Construction access will be specified by individual segments, as identified in Figure 6. Specifying construction access points for each segment will ensure that the least amount of disruption to homeowners and private roadways is maintained. Construction access will be coordinated with individual landowners and the pipeline contractor. Access is subject to change.

Construction activities throughout all segments will occur concurrently to expedite the overall process. Approximate durations of impact provided below for each segment will be overlapping, and should not be summed for a total duration of impact.

Segment 1 – Following the north side of Grey Rock Drive from the dead end to the east up to the crossing of County Road 13 to the west. Construction and materials delivery vehicles will access the alignment via the alignment as it connects to CR 54, to the southeast. In most cases, the vehicles will enter the site from CR 54 to the south, where they will follow the alignment until they reach Grey Rock Drive, and will exit along CR 13 headed south. This segment is approximately 2,500 feet in length. In total, it is anticipated that this area will be impacted for approximately 6 weeks. The alignment is north of Grey Rock Drive for the entire stretch, so no permanent impacts are expected to the roadway.

Segment 2 – Crossing of County Road 13 and paralleling of Bold Venture Way to the north. Construction and material delivery vehicles will access the alignment via the alignment as it connects to Highway 1 to the west. In most cases, the vehicles will enter the site from Highway 1, where they will follow the alignment until they reach Bold Venture Way, and will exit along CR 13 headed south. This segment is approximately 1,000 feet in length, including the crossing of CR 13. In total, it is anticipated that this area will be impacted for approximately 4 weeks. The pipeline across County Road 13 will be installed with an open cut method. However, only one lane at a time will be closed and flaggers will be on site so traffic will not be restricted. The road will be restored to current conditions, so only temporary impacts to the roadway are expected. Otherwise, the alignment is north of Bold Venture Way for the entire stretch, so no permanent impacts are expected to the roadway.

Availability of Space for Other Pipeline in Preferred Corridor

Northern Water has not identified a need for an additional pipe in this corridor for its conveyance needs. Should another entity petition the County for a permit to construct a pipeline in parallel to Northern Water's pipeline, adequate space generally exists to accommodate that pipeline. Northern Water will typically acquire 40 feet of permanent easement plus an additional 60 feet of temporary easement for this project. If another pipeline were to be approved by the County, its permanent easement could abut or overlap Northern Water's permanent easement and they could use Northern Water's permanent easement as their temporary easement.

MEMORANDUM

Northern Integrated Supply Project
Glade Reservoir
Construction Staging

B&V Project Number 403758
B&V File 188754/34.3000
June 10, 2020

To: Larimer County Planning Department
From: Tim Engemoen and Arlene Little, Black & Veatch

Introduction

This technical memorandum identifies probable construction staging areas and construction material sourcing associated with construction of the Glade Unit. This has been done in support of the Larimer County 1041 Permit for the Glade Unit construction. For purposes of this memorandum, construction staging areas are defined as locations used for the storage of construction related equipment and materials, such as office trailers, vehicles and stockpiles.

Project Background

The Northern Integrated Supply Project (NISP) will provide a new raw water supply to several municipal water providers in Northern Colorado. NISP includes the following facilities located in Larimer County: the Glade Unit; the Glade Pump Station; raw water distribution piping; and the relocation of U.S. Hwy. 287. The Glade Unit features the Glade Reservoir Dam, which is an earthen embankment that impounds an off-channel reservoir complete with hydraulic structures required by the State Engineer's Office: the High Level Outlet Works (HLOW); Low Level Outlet Works (LLOW); and spillway.

The Glade Unit also includes expansion of the existing Poudre Valley Canal (PVC) and a new forebay downstream of the dam. A Control Gate structure will be constructed to control flow to the existing portion of the PVC downstream of the forebay. The existing PVC Diversion Structure will be demolished and rebuilt to allow increased diversion of flow from the Poudre River. A portion of the existing Munroe Gravity Canal alignment will be inundated by Glade Reservoir, this open canal will be replaced by the Munroe Canal Bypass (MCB), a conduit and several control structures that will convey flow beneath the reservoir.

The Glade Unit also includes: the Glade Pump Station, which will pump water from the forebay into Glade Reservoir; the Electrical/Control building that will distribute power throughout the site and provide control of the various hydraulic features; the Surge Building that will house surge tanks to protect the pump station discharge conduit; and numerous buried conduits with control valve vaults that connect these facilities. Raw water will be conveyed off site via several buried conduits that are discussed in separate reports. The Glade Unit will include recreational amenities for the general public, including a Visitor Center, campgrounds, a boat ramp, trails and restroom facilities.

Glade Reservoir will submerge a portion of the existing U.S. Hwy. 287 alignment which will be relocated to the east of the reservoir. An existing power transmission line and several power distribution lines will be inundated by the reservoir which will be relocated as part of the Glade Unit construction. A general location map of the Glade Unit facilities is presented on Figure 1.

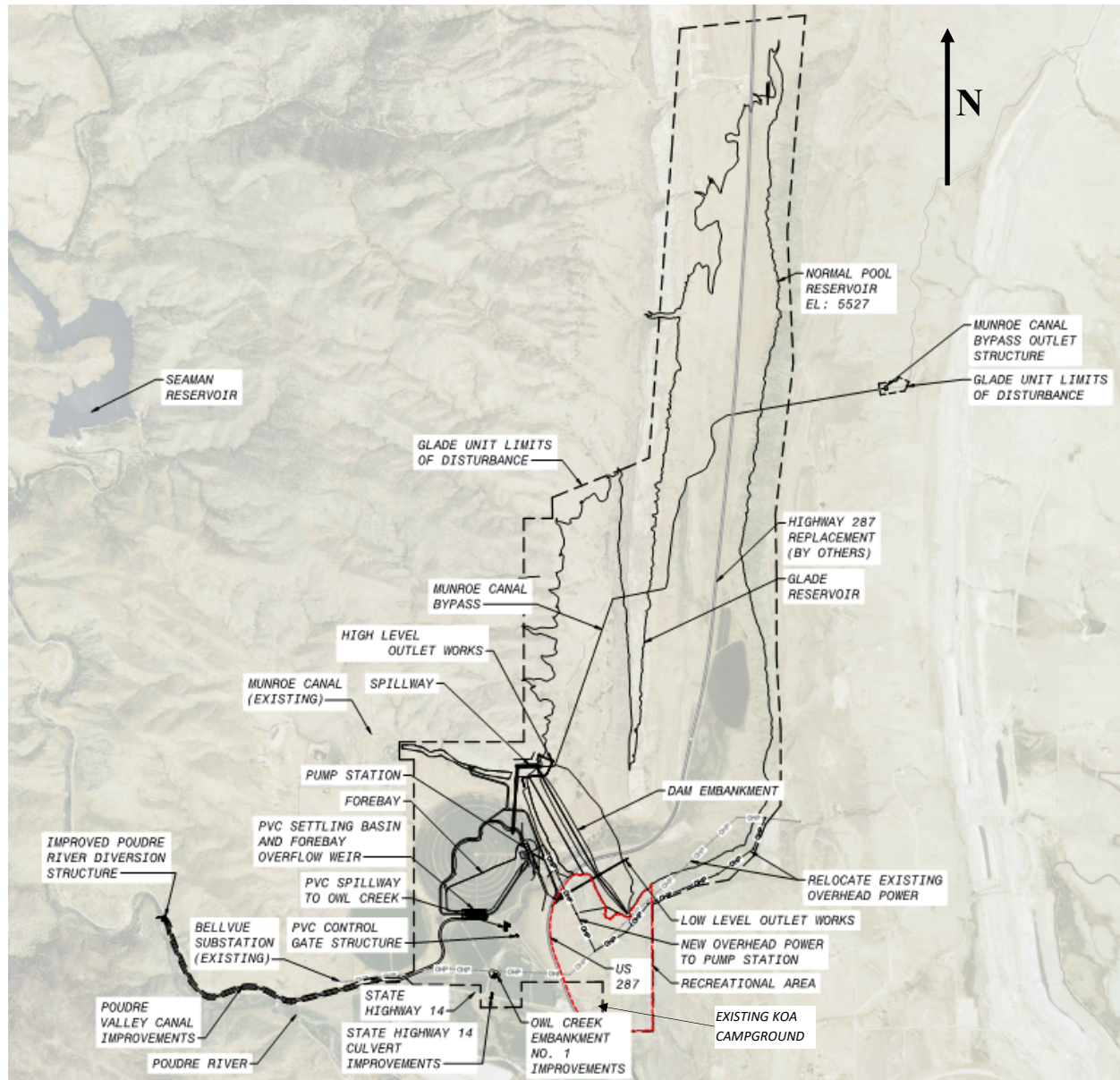


Figure 1 - Glade Unit Overview

Construction Staging Locations

The Glade Unit will be constructed under multiple construction contracts spread out over the project area depicted in Figure 1. The different contracts will likely be executed at different times. Therefore, construction associated with the Glade Unit will not occur concurrently. However, detailed scheduling of

the work will occur in discussion with the with the Construction Manager/General Contractor (CMGC) in 2021.

Without benefit of CMGC input at this time, the design engineer developed a construction contract breakdown and their associated estimated construction schedules.

- Contract 1 – Main Dam Embankment, Forebay, MCB – Construction early 2023 through 2027.
- Contract 2 – Poudre Valley Canal and Owl Creek Improvements – Construction during winters of 2022-2023, 2023-2024, 2024-2025, and 2025-2026. The work within the canal can only be completed when the canal is empty and not conveying irrigation water.
- Contract 3 – Glade Pump Station – Construction late 2024 through 2027.
- Contract 4 – 115 kV Overhead Powerline Relocation – Construction 2023.
- Contract 5 – Electrical Substation – Construction mid-2025 to mid-2027.

The following sections describe likely construction staging locations and strategies for the different components of the Glade Unit project.

Glade Reservoir, Forebay, and Wetlands

It is anticipated the construction of the reservoir, forebay, and wetlands will be completed in two phases to allow for continual presence of wetlands during construction. For both phases, the former KOA campground (east of Ted's Place at the intersection of U.S. Hwy. 287 and State Hwy. 14) will likely be used by the contractor as a temporary construction camp to include trailers, bathrooms, and laydown areas for equipment and materials.

Northern owns, or will own by the time of construction, all the land for the embankment, reservoir pool, and forebay; thus, the contractor will be able to use all this land for construction staging. Borrow material to construct the dam embankment will be taken from several locations across the project site (forebay location, east and west reservoir pool locations) so there will likely be heavy equipment and material stockpiles at various locations at any given time. It is anticipated that there will be routine construction traffic between the former KOA campground and the active construction site(s).

During Phase One, U.S. Hwy. 287 will still be in service through the project site. Phase One construction activities include the following:

- Excavation and foundation preparation for the embankment across the main valley to the west of the existing U.S. Hwy. 287 alignment.
- Tunneling of the LLOW, including upstream and downstream portal excavation which are located to the east of the existing U.S. Hwy. 287 alignment.
- Construction of new wetlands and habitat area on the east and west side of Owl Creek north of the PVC.

At the beginning of Phase Two construction, U.S. Hwy. 287 will be re-routed to its new alignment and the contractor will advance the construction of the embankment across the existing U.S. Hwy. 287 right-of-way. The tunnel for the LLOW will have been completed as part of the Phase One construction and this tunnel will now be used to bypass surface flows from Owl Creek around the construction site.

Glade Pump Station

The Glade Pump Station is located adjacent to the Forebay, just to the south of the dam embankment as shown in Figure 1. The exact staging area for the pump station will likely be adjacent to the forebay in the area between the forebay and the dam embankment.

Poudre Valley Canal

The PVC is being expanded from the Poudre River Diversion Structure to just east of the proposed forebay location. Temporary construction easement will be acquired along this stretch of the canal to provide the contractor adequate room for construction activities and for staging materials and equipment. Construction along the PVC will start at one end of the canal and progress either upstream or downstream so the entire area of the upgraded PVC will not all be impacted at the same time. Part of the PVC expansion will be widening the canal, and due to the proximity to State Hwy. 14, traffic will likely be temporarily reduced to a single lane during construction activities. As previously stated, construction of the canal will only take place during non-irrigating months when the canal is not flowing water.

One of the improvements to the PVC is the upgrade and expansion of the Poudre River Diversion Structure located at the west end of the Glade Unit (shown on Figure 1). The site of the Diversion Structure will likely be used by the Contractor as a main staging area for the PVC improvements for equipment and material storage.

Owl Creek

Improvements to Owl Creek include upgrading an embankment situated between the PVC and State Hwy. 14 and expanding the culvert crossing at State Hwy. 14. Access will come from State Highway 14. Temporary Construction easement will be acquired adjacent to Owl Creek to accommodate construction activities and materials staging.

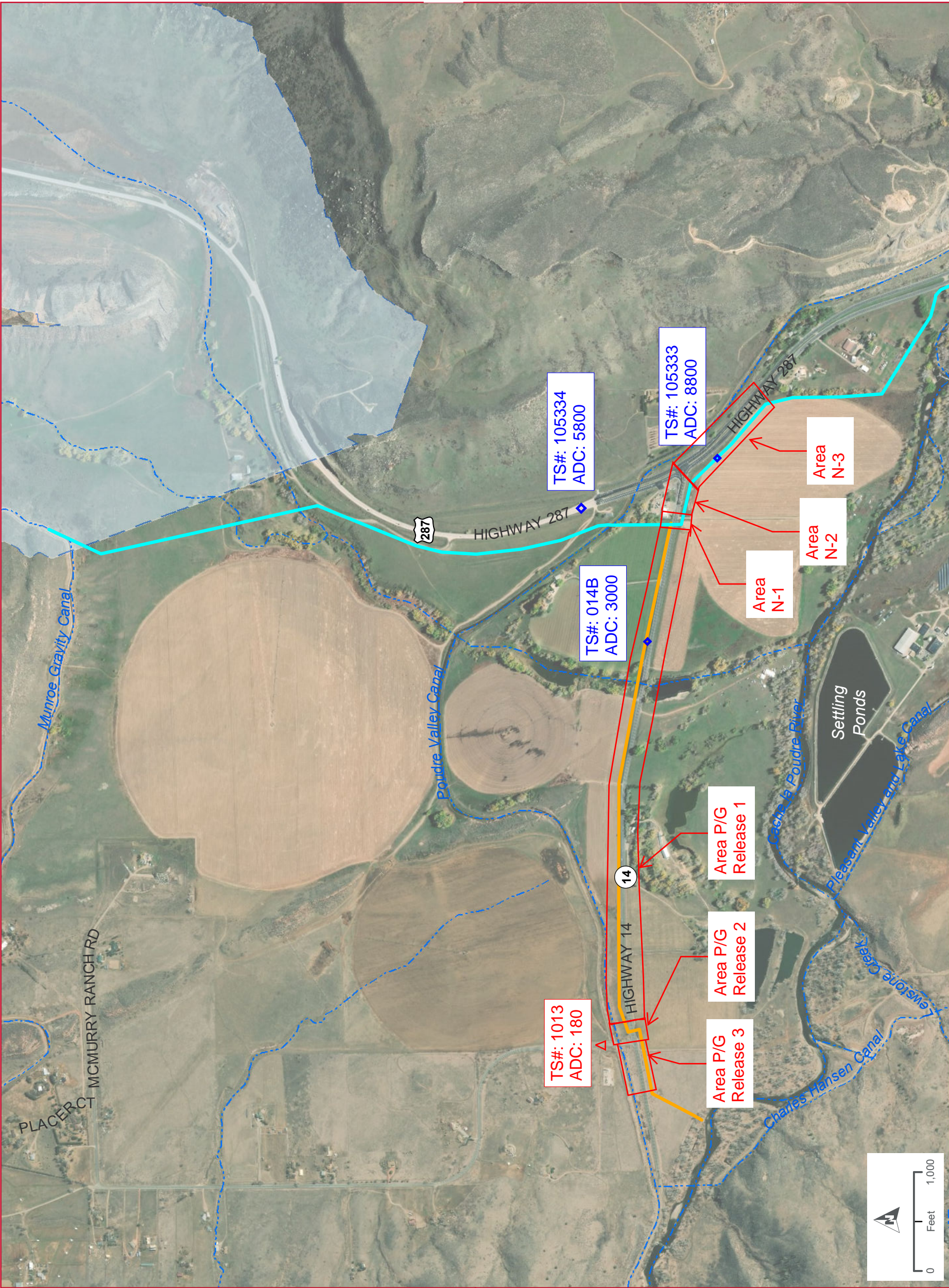
Munroe Canal Bypass and 115 kV Overhead Powerline

The Munroe Canal is an existing irrigation canal that extends across the proposed Glade Reservoir pool. One of the components of construction Contract 1 is to convert a portion of the canal into a closed conduit system (steel pipe encased in concrete) through the reservoir pool. The MCB Inlet Structure is located on the right abutment of the main dam near the spillway and will likely share construction staging areas with the dam embankment work. The MCB Outlet Structure, located near the northeast portion of the reservoir (shown in Figure 1) is remote from other construction activities and will likely need temporary construction easement to provide adequate space for construction materials and equipment.

A portion of an existing 115 kV overhead powerline will be relocated since the existing alignment is partially contained within the reservoir pool. New permanent and temporary easement will be acquired as needed for material and equipment staging during the construction of the new overhead powerline. Like the work along the PVC, this work will progress in a linear fashion and the areas of disturbance will be limited at any given time.

Construction Material Sourcing

Construction of the dam embankment will require a vast amount of material including both soil and rock. The intent is to source most of the dam material on site from identified borrow areas located at the forebay location and the east and west reservoir pool locations. Analysis is still ongoing to determine the estimated amount of soil and rock available onsite for construction purposes. If adequate material cannot be produced from the borrow locations on site, some material may need to be imported from local quarries. It is anticipated that imported material will be brought to site using the I-25 and State Hwy. 14 haul route.



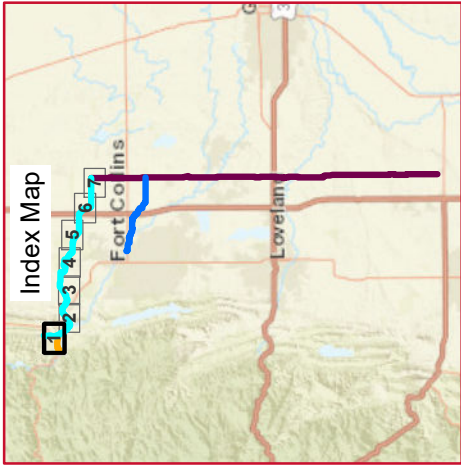
NORTHERN TIER
SHEET 1 OF 7

MAP SERIES 6: TRAFFIC STUDY

Legend

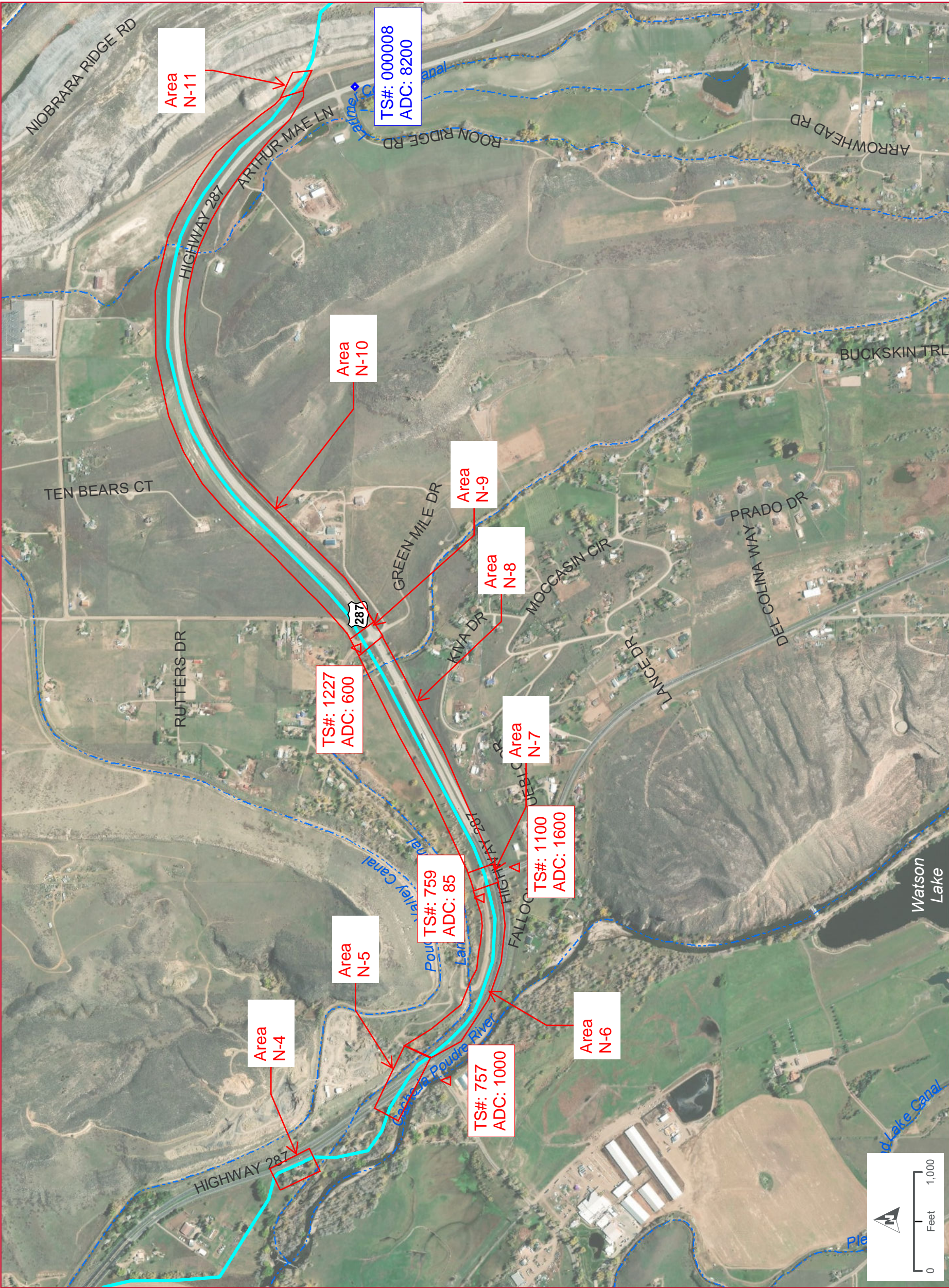
- Glade Release/Poudre Release Pipeline
- Northern Tier Pipeline
- Poudre Intake Pipeline
- County Line Pipeline
- County Boundary
- Railroad
- Stream/Ditch
- Glade Reservoir (future)

- TS#: Traffic Station Number
- ADC: Average Daily Count
- Larimer County Traffic Count Station
- CDOT Traffic Count Station



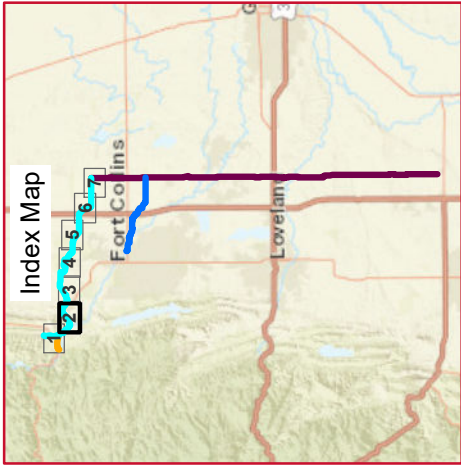
Imagery Date: 10/2017, 03/2018

DATA SOURCES: Northern Water, Larimer County, HDR



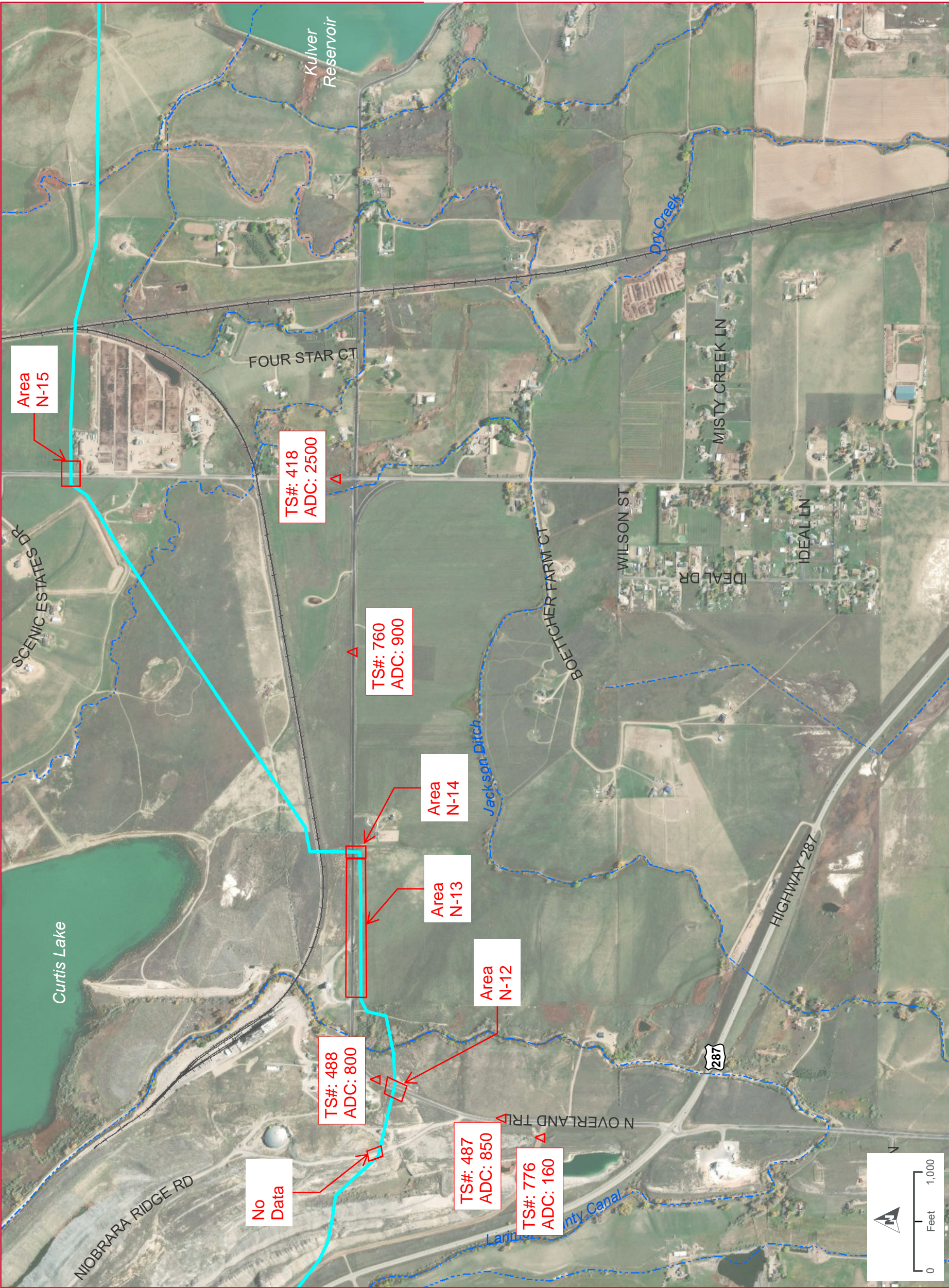
NORTHERN TIER
SHEET 2 OF 7
MAP SERIES 6: TRAFFIC STUDY

- Legend**
- Glade Release/Poudre Release Pipeline
 - Northern Tier Pipeline
 - Poudre Intake Pipeline
 - County Line Pipeline
 - County Boundary
 - Railroad
 - Stream/Ditch
 - Glade Reservoir (future)
 - TS#: Traffic Station Number
 - ADC: Average Daily Count
 - Larimer County Traffic Count Station
 - CDOT Traffic Count Station



Imagery Date: 10/2017

DATA SOURCES: Northern Water, Larimer County, HDR



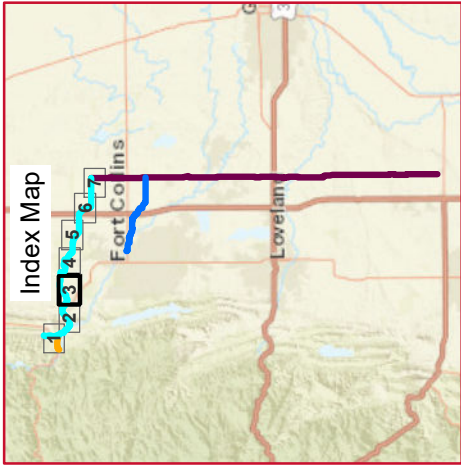
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SHEET 3 OF 7

MAP SERIES 6: TRAFFIC STUDY

Legend

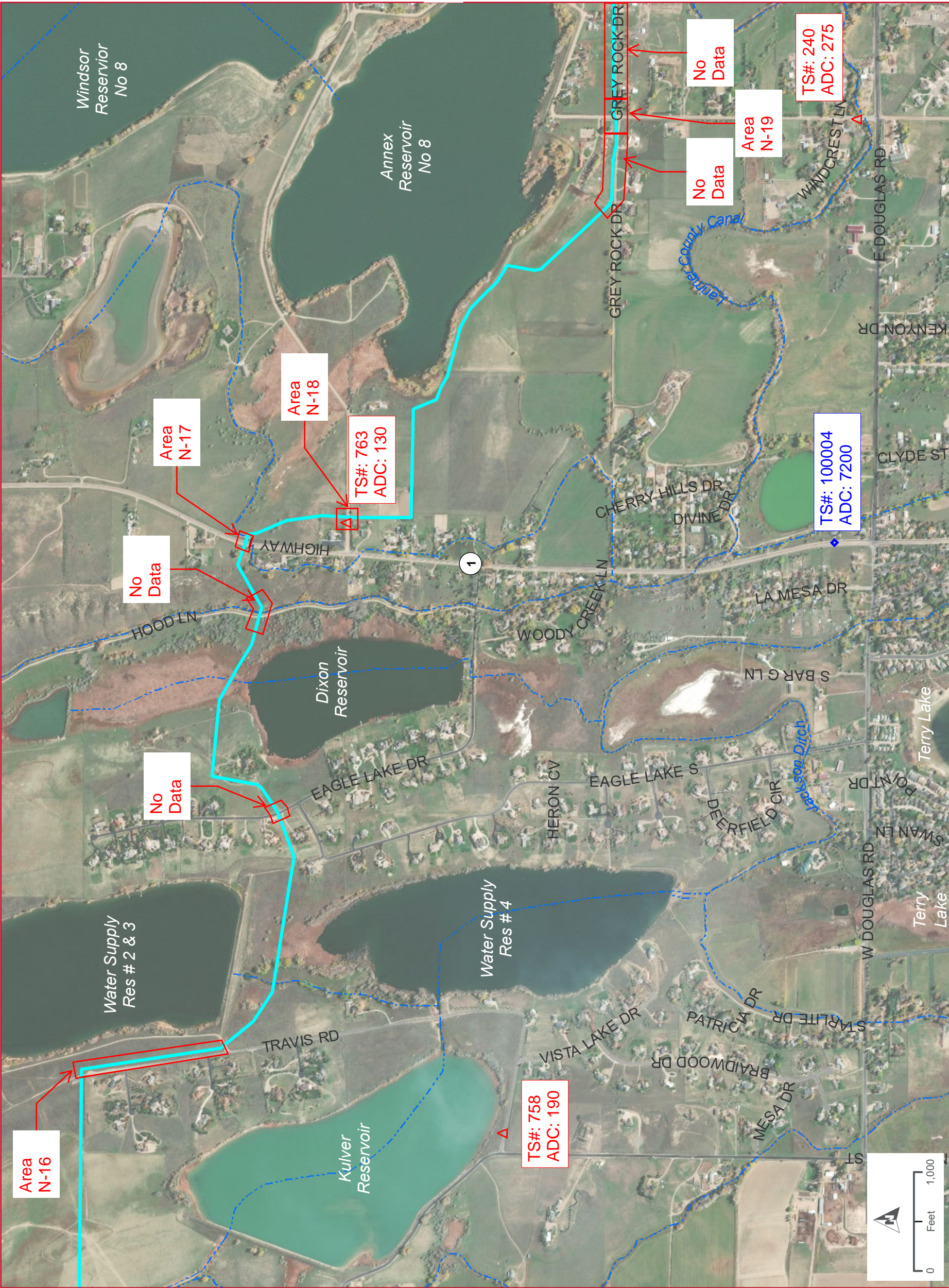
- Glade Release/Poudre Release Pipeline
- Northern Tier Pipeline
- Poudre Intake Pipeline
- County Line Pipeline
- County Boundary
- Railroad
- Stream/Ditch
- Glade Reservoir (future)

- TS#: Traffic Station Number
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- CDOT Traffic Count Station



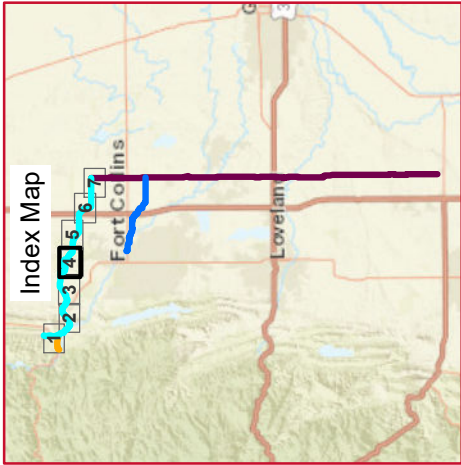
Imagery Date: 10/2017

DATA SOURCES: Northern Water, Larimer County, HDR



NORTHERN TIER
SHEET 4 OF 7
MAP SERIES 6: TRAFFIC STUDY

- Legend**
- Glade Release/Poudre Release Pipeline
 - Northern Tier Pipeline
 - Poudre Intake Pipeline
 - County Line Pipeline
 - County Boundary
 - Railroad
 - Stream/Ditch
 - Glade Reservoir (future)
 - TS#: Traffic Station Number
 - ADC: Average Daily Count
 - Larimer County Traffic Count Station
 - CDOT Traffic Count Station



Imagery Date: 10/2017
DATA SOURCES: Northern Water, Larimer County, HDR

MAP SERIES 6: TRAFFIC STUDY

Glade Release/Poudre Release Pipeline

— Poudre Intake Pipeline

County Boundary

Stream/Ditch

Glade Reservoir (future)

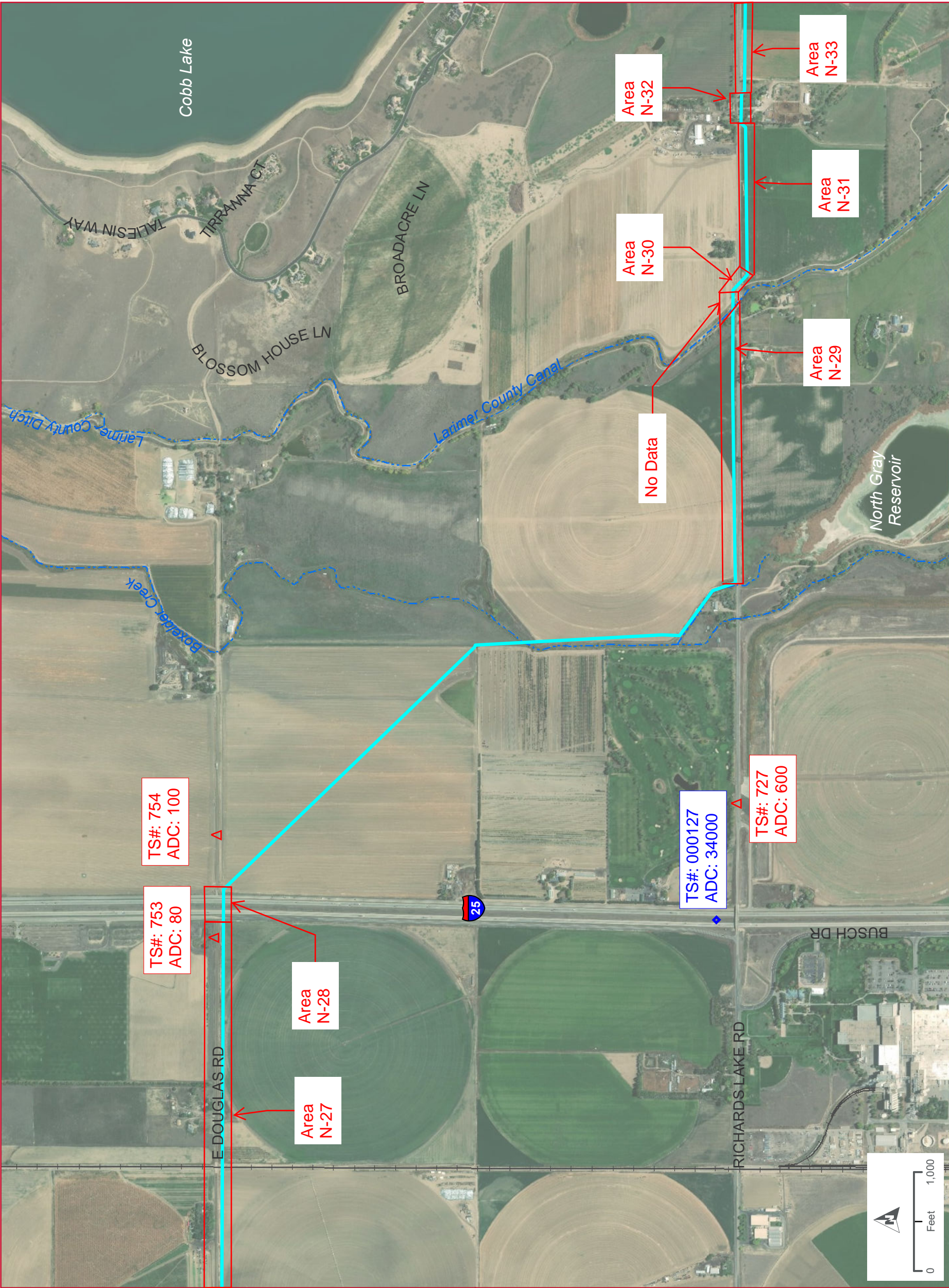
ADC: Average Daily Count

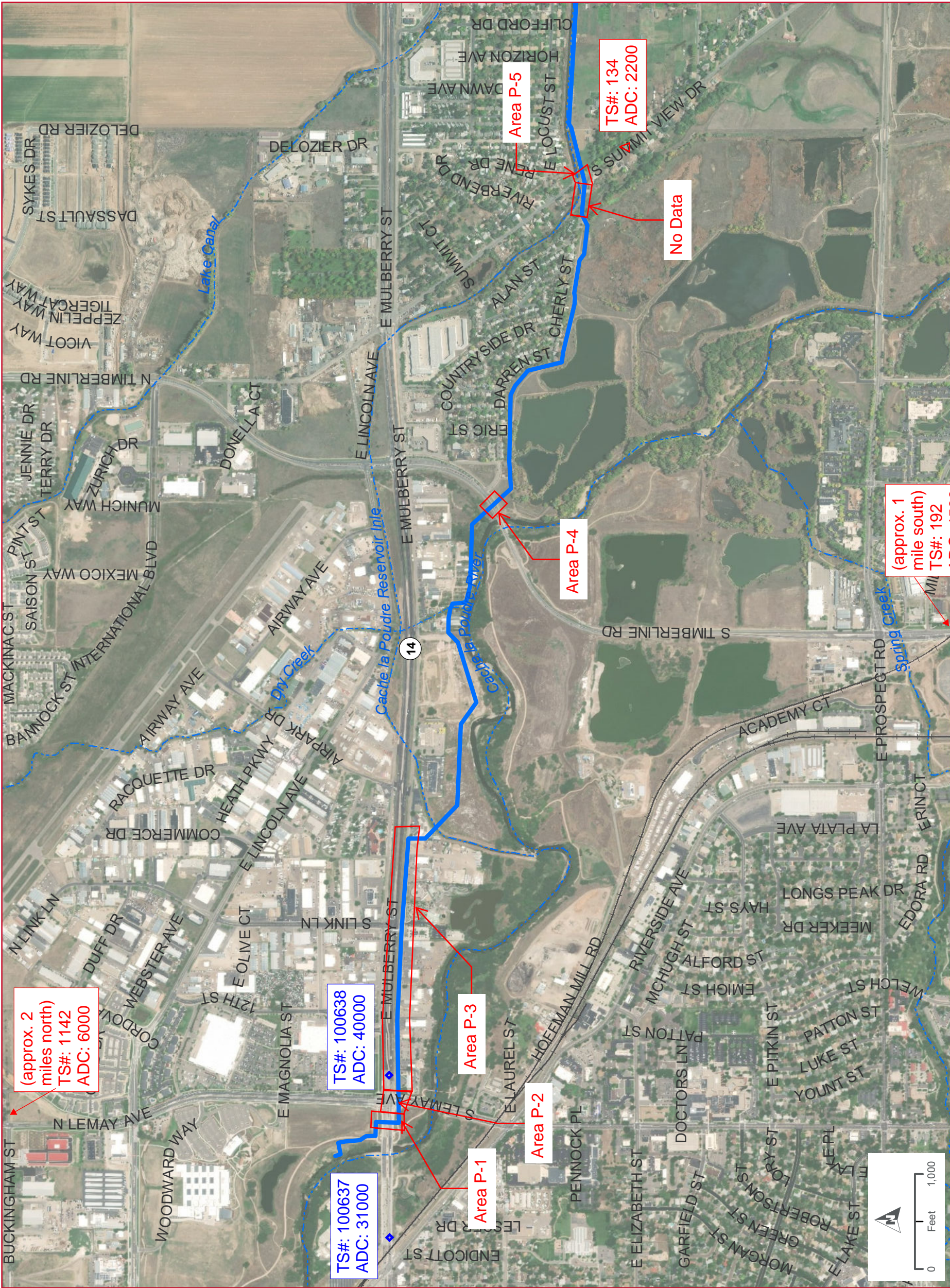
CDOT Traffic Count Station



DATA SOURCES: Northern Water, Larimer County, HDR



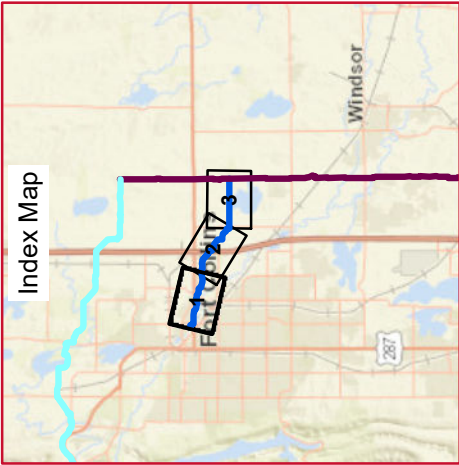




POUDRE INTAKE PIPELINE
SHEET 1 OF 3
MAP SERIES 6: TRAFFIC STUDY

Legend

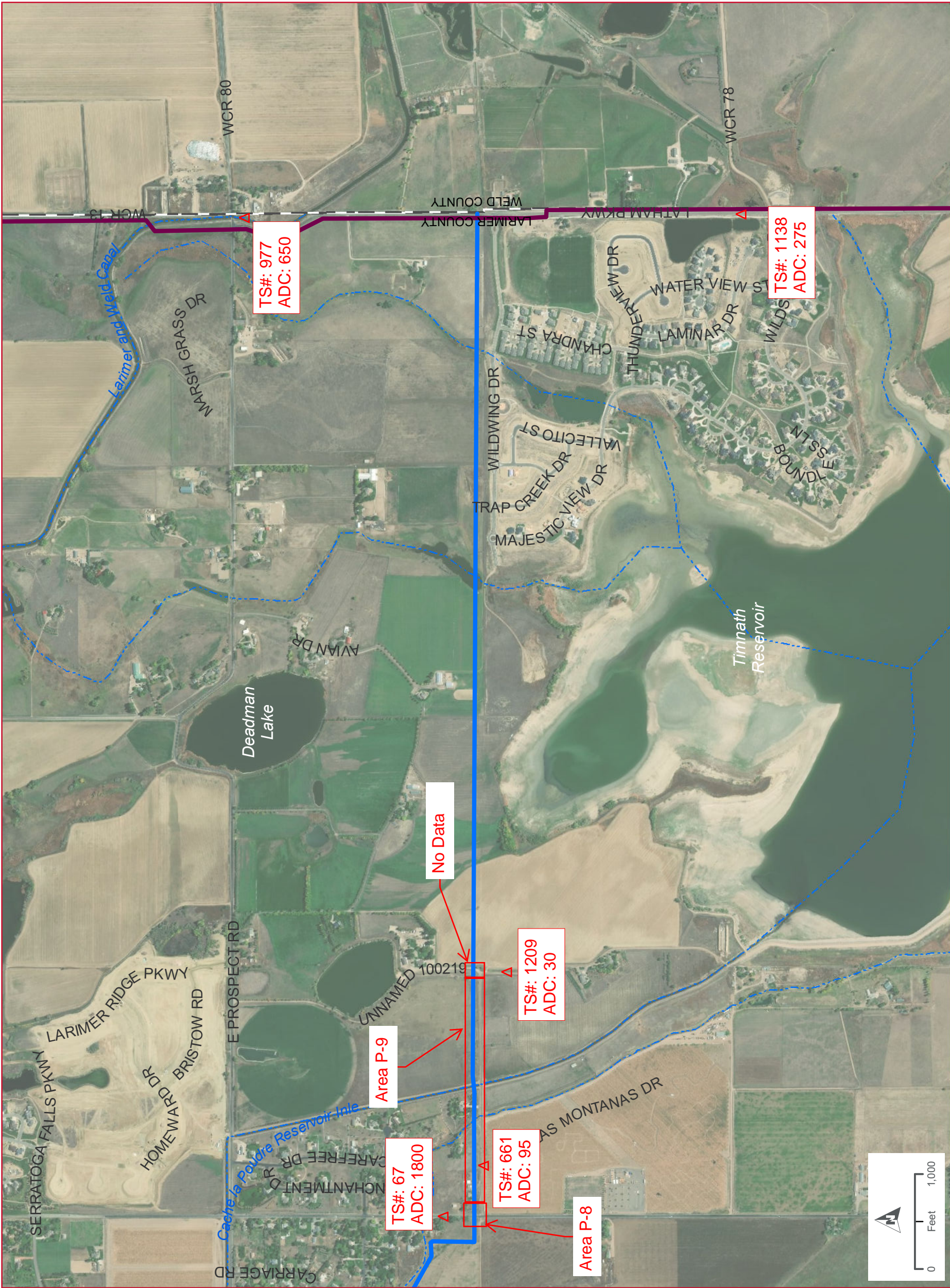
- Poudre Intake Pipeline
- County Line Pipeline
- Northern Tier Pipeline
- County Boundary
- Railroad
- Stream/Ditch
- TS#: Traffic Station Number
- ADC: Average Daily Count
- Larimer County Traffic Count Station
- CDOT Traffic Count Station



Imagery Date: 08/2018, 10/2018

DATA SOURCES: Northern Water, Larimer County, HDR

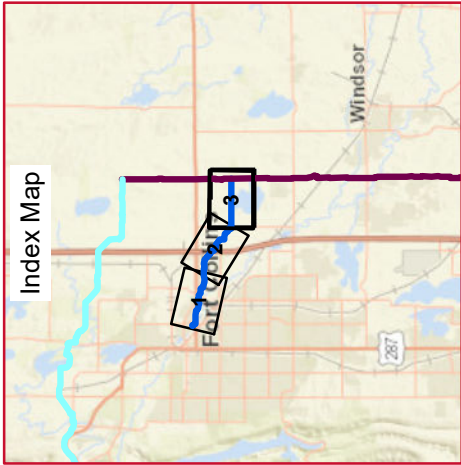




POUDRE INTAKE PIPELINE
SHEET 3 OF 3
MAP SERIES 6: TRAFFIC STUDY

Legend

- Poudre Intake Pipeline
- County Line Pipeline
- Northern Tier Pipeline
- County Boundary
- Railroad
- Stream/Ditch
- TS#: Traffic Station Number
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- Larimer County Traffic Count Station
- CDOT Traffic Count Station



Imagery Date: 10/2018
DATA SOURCES: Northern Water, Larimer County, HDR



MEMORANDUM

Date: June 10, 2020

To: Larimer County Planning Department

From: Randy Parks and Derek Nelson - Dewberry Engineers Inc.

Subject: Northern Integrated Supply Project – Traffic Impact Study – Revised June 2020



This section addresses requirements of the 1041 Permit item 8.d for Traffic Impact Study. It describes the effects of the NISP conveyance facilities that are within unincorporated parts of Larimer County. Such facilities include:

- Northern Tier Pipeline
- Poudre Release/Glade Release Pipeline
- Poudre Intake Pipeline
- County Line Pipeline
- Glade Reservoir Pump Station
- Poudre Diversion Pump Station

Methods

Effects on traffic and transportation were assessed based on existing roadway information from the Larimer County Road Information Locator webpage and, when needed, from CDOT Road Traffic Count data. The most recent available data from Larimer County was used, which came from the years 2000, 2009, 2015, 2017, and 2018; depending upon the node. Traffic volumes obtained from CDOT were conducted in 2014. The road classification and Annual Average Daily Traffic (ADT) count from nodes that were available along the alignments can be seen in Map Series 6 in Attachment D to the Project Description.

Since the County Line Pipeline is parallel and adjacent to the roadway, good traffic data existed along the entire alignment. The tabulated data was taken from the ADT found after one another and averaged. The reach between nodes were then designated as a work area. This data is presented in table 4.

Since the Northern Tier Pipeline, Poudre Intake Pipeline, and Poudre Release/Glade Release Pipeline do not parallel roadways consistently, data was tabulated through an alternative method by creating “Traffic Study Areas” which can be seen in map series 6 in Attachment D to the Project Description. Additionally, the density of traffic station locations was significantly less than along the County Line Pipeline, which necessitated a modified approach. Tables 1-3 in this memo list all areas, relevant traffic stations, traffic counts, approximate length of crossing, street impact, closure requirements and estimated duration for the Northern Tier, Poudre Intake, and Poudre Release/Glade Release Pipelines. The Traffic Study Areas were broken up as portions of the pipeline that parallel roadways within 100 feet, cross roadways with trenchless crossings, or cross gravel roads.

General NISP Conveyance Information

An alternatives alignment study was performed and the preferred alignment for NISP conveyance can be found as part of the Conveyance Routing Assessment (Technical Memorandum 3). Although the final design of the pipeline will be developed at a later date, the NISP conveyance lines are expected to have a 60-foot permanent easement and a 40-foot temporary construction easement. The NISP pipelines are planned to be routed as much as possible in private easement rather than public right-of-way. By routing most of the pipeline in private easements traffic impacts will be lessened.

Crossings

Water pipeline road crossings in Larimer County will be constructed using trenchless methods on all paved roadways and open-cut construction on unpaved roadways. A list of all anticipated trenchless and open-cut crossings is presented in Tables 1-4. Trenchless construction methods would cause only minor disruption to traffic and would have negligible short-term effects. Any roadway that is unpaved (e.g. gravel) would use open-cut construction. Open-cut construction of pipelines would require a trench to be dug along the length of the pipeline, affecting the segment of the road that requires the trench. The pipeline would then be laid in the trench, and the trench would be backfilled to pre-existing conditions. Roadways that would be open-cut would either have temporary lane closures or would be closed to traffic, and a detour route would be provided during construction. The NISP conveyance will likely cross the Great Western and Union Pacific Railroads in several places. Trenchless construction methods would be used at the railroad crossings.

General Compliance

For all pipeline alignments adjacent to or crossing the road ROW, Northern Water and/or construction contractors would be required to develop traffic control plans. Traffic control plans would be subject to approval by the transportation agency responsible for the impacted roadway. As such, short-term effects on local roadways during construction are expected to be minor for construction areas. If the level of construction activity impacted traffic to a greater magnitude than anticipated, the construction contractor would work with the responsible transportation agency to reduce the traffic effect to an acceptable level based on their policies and standards.

Further, it is understood that during final design, Northern Water will be required to represent anticipated haul/delivery routes and coordinate same with Larimer County.

All activities in or adjacent to, access to and from, and including hauling/delivery on Larimer County roads/ROW must abide by the Larimer County Access Policy and Larimer County Land Use Code.

Mitigation

Mitigation of traffic impacts will be addressed on a road-by-road basis and for local community/residences/businesses during final design. General mitigation measures that may be implemented include:

- Utilization of major roads and bridges for haul routes whenever feasible.

MEMORANDUM

- Minimization of hauling/deliveries during peak driving hours.
- Coordination with the County and other entities to avoid planned concurrent road construction.
- Coordination with local schools on bus routes and pickup or drop-off times.
- Maintenance of access to residents and businesses to include emergency vehicles, trash pickup, and postal/delivery services.
- Stabilized construction access in accordance with erosion control and streets ordinances.
- Dust control during construction.

Durations

Construction durations per work area were estimated with production rates using factors including pipe diameter, route complexity, route length, available construction corridor area and access, utility density, and terrain challenges. Estimated construction durations per work area can be found in Tables 1-4.

Revisions

Updates were made to the memo after receiving comments from the Larimer County Planning Department in May 2020. Public and private gravel road crossings were added to the ROW impact tables for Northern Tier, Poudre Intake and Glade/Poudre Release alignments, as well as other roadway impacts that were not included in the original memo. Lengths and duration of impact were updated as needed to account for additional crossings or other reasons.

MEMORANDUM

Table 1- Northern Tier Annual Average Daily Traffic (ADT)

	Traffic Station 1 Type	Traffic Station 1	Traffic Count 1	Traffic Station 2 Type	Traffic Station 2	Traffic Count 2	Traffic Count Used	Approx. Length (ft)	Street Impacted	Type of Impact	Closure Required?	Estimated Duration (Days)
Area N-1	CDOT	014B	3000	-	-	-	3000	150	HW 14	Trenchless Crossing	No	5
Area N-2	CDOT	014B	3000	-	-	-	3000	400	HW 14	Parallel	No	2
Area N-3	CDOT	105333	8800	-	-	-	8800	1200	HW 287	Parallel	No	6
Area N-4	CDOT	105333	8800	CDOT	000008	8200	8500	500	HW 287	Parallel	No	5
Area N-5	CDOT	105333	8800	CDOT	000008	8200	8500	500	HW 287	Trenchless Crossing	No	17
Area N-6	CDOT	105333	8800	CDOT	000008	8200	8500	2,100	HW 287/CR 56	Parallel	No	21
Area N-7	LC	759	85	LC	1227	600	343	100	CR 56	Gravel Crossing	No- single lane flagged	3
Area N-8		105333	8800	CDOT	000008	8200	8500	2,500	HW 287	Parallel	No	13
Area N-9	LC	759	85	LC	1227	600	343	100	CR 56	Gravel Crossing	No- single lane flagged	3
Area N-10		105333	8800	CDOT	000008	8200	8500	6,600	HW 287	Parallel	No	33
Area N-11	LC	776	160	-	-	-	160	100	CR 56 E	Gravel Crossing	No- single lane flagged	3
No Data	-	-	-	-	-	-	-	100	CR 21C/ Niobrara Rodge	Gravel Crossing	No- single lane flagged	3

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Area N-12	LC	488	800	LC	487	850	825	100	CR56/ CR 21-C/ Overland Trail	Trenchless Crossing	No	3
Area N-13	LC	488	800	LC	760	900	850	1500	CR56/ CR 21-C/ Overland Trail	Parallel	No	8
Area N-14	LC	488	800	LC	760	900	850	100	CR56/ CR 21-C/ Overland Trail	Trenchless Crossing	No	3
Area N-15	LC	418	2500	-	-	-	2500	100	Taft Hill Rd	Trenchless Crossing	No	3
Area N-16	LC	758	190	-	-	-	190	1500	Travis	Parallel	No	8
No Data	-	-	-	-	-	-	-	100	Eagle Lake Dr	Trenchless Crossing	No	3
No Data	-	-	-	-	-	-	-	100	Hood Lane	Gravel Crossing	Homeowner access maintained with temporary detours	1
Area N-17	CDOT	100004	7200	-	-	-	7200	250	HW 1	Trenchless Crossing	No	8
Area N-18	LC	763	130	-	-	-	130	100	E CR 56	Gravel Crossing	No- single lane flagged	3
No Data	-	-	-	-	-	-	-	900	Grey Rock	Parallel	No	5
Area N-19	LC	240	275	-	-	-	275	100	N CR 13	Gravel Crossing	No- single lane flagged	3
No Data	-	-	-	-	-	-	-	2500	Grey Rock	Parallel	No	13

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Area N-20	LC	199	130	LC	200	80	105	100	Turnberry	Gravel Crossing	No- single lane flagged	3
Area N-21	LC	750	1400	LC	751	1400	1400	100	CR 54/ Douglas	Trenchless Crossing	No	3
Area N-22	LC	750	1400	LC	751	1400	1400	1600	CR 54/ Douglas	Parallel	No	8
Area N-23	LC	750	1400	LC	751	1400	1400	100	CR 54/ Douglas	Trenchless Crossing	No	3
Area N-24	LC	750	1400	LC	751	1400	1400	1100	CR 54/ Douglas	Parallel	No	6
Area N-25	LC	140	2400	-	-	-	2400	100	Giddings	Trenchless Crossing	No	3
Area N-26	LC	752	90	LC	753	80	85	100	CR 54/ Douglas	Gravel Crossing	No- single lane flagged	3
Area N-27	LC	752	90	LC	753	80	85	5000	CR 54/ Douglas	Parallel	No	25
Area N-28	CDOT	000127	34000	-	-	-	34000	350	I-25	Trenchless Crossing	No	12
Area N-29	LC	727	600	LC	728	350	475	2800	CR 52/ Richards Lake	Parallel	No	14
No Data	-	-	-	-	-	-	-	100	Broadacre Lane	Gravel Crossing	Homeowner access maintained with temporary detours	1
Area N-30	LC	727	600	LC	728	350	475	250	CR 52/ Richards Lake	Trenchless Crossing	No	8
Area N-31	LC	727	600	LC	728	350	475	1500	CR 52/ Richards Lake	Parallel	No	8

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Area N-32	LC	727	600	LC	728	350	475	400	CR 52/ Richards Lake	Parallel	No- single lane flagged. Construction staging in lane, but no excavation in road.	10
Area N-33	LC	727	600	LC	728	350	475	1200	CR 52/ Richards Lake	Parallel	No	6
No Data	-	-	-	-	-	-	-	100	Barry Lane/ Brooklind Estates	Trenchless Crossing	No	3
Area N-34	LC	727	600	LC	728	350	475	1000	CR 52/ Richards Lake	Parallel	No	5
Area N-35	LC	24	130	-	-	-	130	100	CR 3	Gravel Crossing	No- single lane flagged	3
Area N-36	LC	729	325	LC	730	250	288	950	CR 52/ Richards Lake	Construction in Gravel road	Homeowner access maintained with temporary detours	10
Area N-37	LC	729	325	LC	730	250	288	1000	CR 52/ Richards Lake	Parallel	No	5
Area N-38	LC	729	325	LC	730	250	288	100	CR 52/ Richards Lake	Gravel Crossing	No- single lane flagged	3
Area N-39	LC	729	325	LC	730	250	288	3000	CR 52/ Richards Lake	Parallel	No	15

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Table 2- Poudre Intake Annual Average Daily Traffic (ADT)

	Traffic Station 1 Type	Traffic Station 1	Traffic Count 1	Traffic Station 2 Type	Traffic Station 2	Traffic Count 2	Traffic Count Used	Approx. Length (ft)	Street Impacted	Type of Impact	Closure Required?	Estimated Duration (days)
Area P-1	CDOT	100637	31000	-	-	-	31000	250	Mulberry	Trenchless Crossing	No	8
Area P-2	LC	1142	6000	-	-	-	6000	200	Lemay	Trenchless Crossing	No	7
Area P-3	CDOT	100638	40000	-	-	-	40000	2800	Mulberry	Parallel	No	28
Area P-4	LC	192	4500	-	-	-	4500	200	Timberline	Trenchless Crossing	No	7
No Data	-	-	-	-	-	-	-	400	Cherly	Construction in Paved Roads	Homeowner access maintained with temporary detours	4
Area P-5	LC	134	2200	-	-	-	2200	150	Summit View	Trenchless Crossing	No	5
Area P-6	CDOT	101036	63000	-	-	-	63000	350	I-25	Trenchless Crossing	No	12

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Area P-7	LC	671	1600	LC	672	2100	1850	150	Prospect	Trenchless Crossing	No	5
No Data	-	-	-	-	-	-	-	1000	McLaughlin	Parallel	No	7
Area P-8	LC	67	1800	-	-	-	1800	150	CR 5	Trenchless Crossing	No	5
Area P-9	LC	661	95	-	-	-	95	2500	CR 42 E	Parallel	No	17
No Data	-	-	-	-	-	-	-	100	Unnamed 100219/CR 3e	Gravel Crossing	Homeowner access maintained with temporary detours	1

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Table 3- Poudre/Glade Release Annual Average Daily Traffic (ADT)

	Traffic Station 1 Type	Traffic Station 1	Traffic Count 1	Traffic Station 2 Type	Traffic Station 2	Traffic Count 2	Traffic Count Used	Approx. Length (ft)	Street Impacted	Type of Impact	Closure Required?	Estimated Duration (days)
Area P/G R-1	CDOT	014B	3000	-	-	-	3000	5200	HW 287	Parallel	No	26
Area P/G R-2	CDOT	014B	3000	-	-	-	3000	150	HW 287	Trenchless Crossing	No	5
Area P/G R-3	CDOT	014B	3000	-	-	-	3000	700	HW 287	Parallel	No	4

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Table 4- County Line Annual Average Daily Traffic (ADT)

Work Area	Station 1	ADT 1	Station 2	ADT 2	Average Traffic Count	Trenchless Crossings (paved)	Open-Cut Crossings (gravel)	Duration (days)
C-1	983	210	982	500	355	1. Trenchless crossing 2,640-feet north of CR 48 across CR 1	0	117
						2. Trenchless crossing 1,780-feet north of CR 48 across CR 1		
						3. Trenchless crossing across CR 48 at the intersection with CR 1		
C-2	981	500	980	475	488	1. Trenchless crossing across Hwy 14 at the intersection with CR 1	0	39
C-3	979	550	978	325	438	1. Trenchless crossing across CR 44 at the intersection with CR 1	0	39
C-4	977	650	1138	275	463	1. Trenchless crossing across Wildwing Dr. at CR 1 2. Trenchless crossing 2,375-feet north of WCR 78 across CR 1	1. Open-cut crossing across WCR 78	78
C-5	1138	275	1200	2000	1138	1. Trenchless crossing diagonally across the intersection of LCR 40 and CR 1	0	195
						2. Trenchless crossing diagonally across the intersection of LCR 38 and CR 1		
						3. Trenchless crossing under railroad 6,500 feet south of LCR 38		
						4. Trenchless crossing 1,350-feet north of LCR 32E across CR 1		
						5. Trenchless crossing across LCR 32E at the intersection with CR 1		
C-6	1200	2000	1199	1500	1750	0	0	15

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C-7	1199	1500	976	4500	3000	1. Trenchless crossing across Hwy 392	0	39
C-8	976	4500	1203	4700	4600	1. Trenchless crossing 1,900 feet south of Hwy 392 across CR 2. Trenchless crossing across Steeplechase Dr 3. Trenchless crossing across Bounty Dr 4. Trenchless crossing across WCR 62	1. Open-cut crossing across WCR 64	156
C-9	1203	4700	975	4800	4750	1. Trenchless crossing 2,530 feet south of WCR 62 across CR 1 2. Trenchless crossing 4,590 feet south of WCR 62 across CR 1	1. Open-cut crossing beneath WCR 60	78
C-10	975	4800	CDOT traffic count	2200	3500	1. Trenchless crossing across Hwy 34 2. Trenchless crossing 400 feet south of Hwy 34 3. Trenchless crossing 800 feet south of Hwy 34 under railroad 4. Trenchless crossing 2,800 feet south of Hwy 34 under railroad 5. Trenchless crossing under railroad at CR 20C 6. Trenchless crossing 6,000 feet south of Hwy 34 across CR1 7. Trenchless diagonal crossing across LCR 18 8. Trenchless crossing across LCR 16 9. Trenchless crossing north of LCR 14 and CR 1 across CR1	0	351