

RECLAMATION

Managing Water in the West

Truckee-Carson Irrigation District Lewis Wasteway Replacement and Low Head Hydroelectric Project - *DRAFT* Environmental Assessment



U.S. Department of the Interior
Bureau of Reclamation
Lahontan Basin Area Office
705 N. Plaza, Room 320
Carson City, NV 89701

Mission Statements

The mission of the Department of the Interior is to protect and provide access to our Nation's natural and cultural heritage and honor our trust responsibilities to Indian Tribes and our commitments to island communities.

The mission of the Bureau of Reclamation is to manage, develop, and protect water and related resources in an environmentally and economically sound manner in the interest of the American public.

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1.0 INTRODUCTION

1.1 Background

The Newlands Project covers lands in the west-central Nevada counties of Churchill, Lyon, Storey, and Washoe. Water for the Newlands Project primarily from the Carson River and is supplemented from the Truckee River. Annual normal precipitation in the irrigation region of the Newlands Project near Fernley and Fallon, Nevada, is 5.3 inches (USBR Newlands Project website) and temperatures range from a low of -27 degrees to a high over 100 degrees (Western Regional Climate Center, Monthly Maximum/Minimum of Maximum/Minimum Daily Temperature).

The Newlands Project, formerly the Truckee-Carson Project, was one of the first Reclamation projects authorized by the Secretary of the Interior on March 14, 1903, pursuant to the Reclamation Act of 1902 (Act of June 17, 1902, 32 Stat. 388). Construction began in 1903, with the first irrigation season being in 1905. The Newlands Project provides full service irrigation water from the Truckee and Carson River Basins with the Truckee Canal allowing interbasin diversions from the Truckee River to the Carson River. The Truckee division includes Lake Tahoe Dam, Derby Diversion Dam, the Truckee Canal and an irrigation delivery system for service to approximately 5,000 acres of irrigated lands. The Carson Division includes Lahontan Dam, Lahontan Power Plants, Carson River Diversion Dam and canals, laterals, and drainage facilities for irrigation of approximately 55,000 acres of farmland. In addition, water from about 6,000 acres of Newlands Project lands have been transferred to the Fallon National Wildlife Refuge Lahontan Valley wetlands near Fallon. The drainage basins contain nearly 3,400 square miles with a combined average annual runoff of about 850,000 acre-feet of water.

Water for the Newlands Project is diverted from the Truckee River into the Truckee Canal for irrigation of the Truckee Division and for conveyance to Lahontan Reservoir for storage. Water stored in Lahontan Reservoir is released into the Carson River through the Lahontan Power Plant or it is diverted into the V-Line and T-Line Canals at the Carson River Diversion Dam for irrigation of the Carson Division. The Carson River Diversion Dam is on the Carson River about five miles below Lahontan Dam and is 241 feet long with a 225 foot long by 31 foot high concrete control structure. Construction of the Carson River Diversion Dam was completed in 1906.

Two main canals carry water from the Carson River Diversion Dam to Newlands Project lands. The T-Line Canal serves lands on the north side of the Carson River. It is nine miles long with a bottom width of 10 feet, and has a capacity of 450 cubic feet per second (cfs). The V-Line Canal serves lands on the south side of the Carson River and is 27 miles long. The original bed width of the canal varied from 22 feet at the headworks down to 13 feet at the end.

Under terms of the contract between the United States Department of the Interior Bureau of Reclamation and the Truckee-Carson Irrigation District (TCID), dated December 18, 1926, the care, operation, and maintenance of the Newlands Project was transferred to TCID on December 31, 1926. The United States and TCID entered into a new contract for the care, operation, and maintenance of the Newlands Project on November 25, 1996.

The Newlands Project water is mostly used for agriculture. Since its inception, the Newlands Project has been home to many different types of crops. Now, principal irrigated crops are alfalfa hay, grass hay, irrigated pasture, barley, wheat, corn, oats, and sorghum. The Newlands Project provides service to approximately 58,000 total acres including fertile bench lands adjacent to the Truckee Canal west and south of Hazen, and the rest on the north and south sides of the Carson River near Fallon.

TCID currently operates Old Lahontan Power Plant (1920 kilowatts (kW)) built in 1911, the New Lahontan Power Plant (4000 kW) built in 1988, and the V-Line Canal 26 Foot Drop Power Plant (800 kW) built in 1955.

This Draft Environmental Assessment (Draft EA) is being prepared to analyze TCID's proposal to replace the Lewis Wasteway and to develop low head hydroelectric power sources and related appurtenances at two locations within the Newlands Project.

The action associated with the project is for Reclamation to issue a Lease of Power Privilege (LOPP) Agreement (14-LC-20-0500) and an Additions or Alterations to Conveyance and Distribution Facilities Permit (14-LC-20-0498) (Permit) to use facilities under Reclamation's jurisdiction for hydroelectric power generation that is consistent with Reclamation project purposes. The issuance of these documents is pursuant to P.L. 113-24 and the Reclamation Project Act of 1939, and acts amendatory and supplementary thereto.

1.2 Purpose and Need for the Project

1.2.1 Replacement of the Lewis Wasteway

TCID is proposing to replace the Lewis Wasteway structure, which suffered a structure failure in June 2008. The structure was replaced with a compacted earthen embankment. Replacement of the Wasteway would:

- Restore the ability to evacuate the V-Line Canal during an emergency event
- Allow TCID operational flexibility in delivering water to the Newlands system
- Reduce risk to the urbanized reaches of the V-Line Canal.

1.2.2 Hydroelectric Power at Lewis Wasteway and A-C3 Panicker Drop

In addition to replacement of the Lewis Wasteway, TCID is requesting the authorization, development, and implementation of a LOPP Agreement No. 14-LC-20-0500 and the issuance of Permit No. 14-LC-20-0498 for the construction and installation of a small conduit low head hydroelectric unit and related appurtenances at two structures located within the Newlands Project, see Figure 1 Vicinity Map – Hydroelectric Project Locations.

One small conduit low head hydroelectric unit would be installed at the replaced Lewis Wasteway and would be a 250 maximum kW unit. Connection to the electrical grid would be through existing NV Energy facilities.

The second small conduit low head hydroelectric unit would be installed at A-C3 Panicker Drop and would generate a maximum of 125 kW. In addition, there would be the construction and installation of a 1,400-foot single-phase power line by NV Energy that would connect the hydroelectric unit at A-C3 to the electrical grid.

The Permit would authorize TCID to construct additions or make alterations to facilities under Reclamation's jurisdiction and water used for conduit hydroelectric power generation would be incidental to the use of water for Reclamation project purposes. While the LOPP, pursuant to Public Law 113-24 Bureau of Reclamation Small Conduit Hydropower Development and Rural Jobs Act of August 9, 2013 and the Reclamation Project Act of 1939 (43 U.S.C. 485h(c)) (1939 Act) and acts amendatory or supplementary thereto, would grant TCID the right to utilize the interests in lands, roads, dams, outlet works, and water ways, which Reclamation may have jurisdiction of, for the purpose of constructing and installing two small conduit low head hydroelectric units to develop hydroelectric power generation, and

the right to market and sell the power generated by the new units, including Renewable Energy attributes and Renewable Energy Credits.

The TCID is proposing to take advantage of the irrigation water flows and vertical drops across the two - structures within the Newlands Project to provide energy and generate power efficiently while providing a revenue source for TCID's care, operation, and maintenance costs associated with the Newlands Project. No new water is needed for the hydroelectric projects, as the water being used would be incidental to the normal irrigation flows.

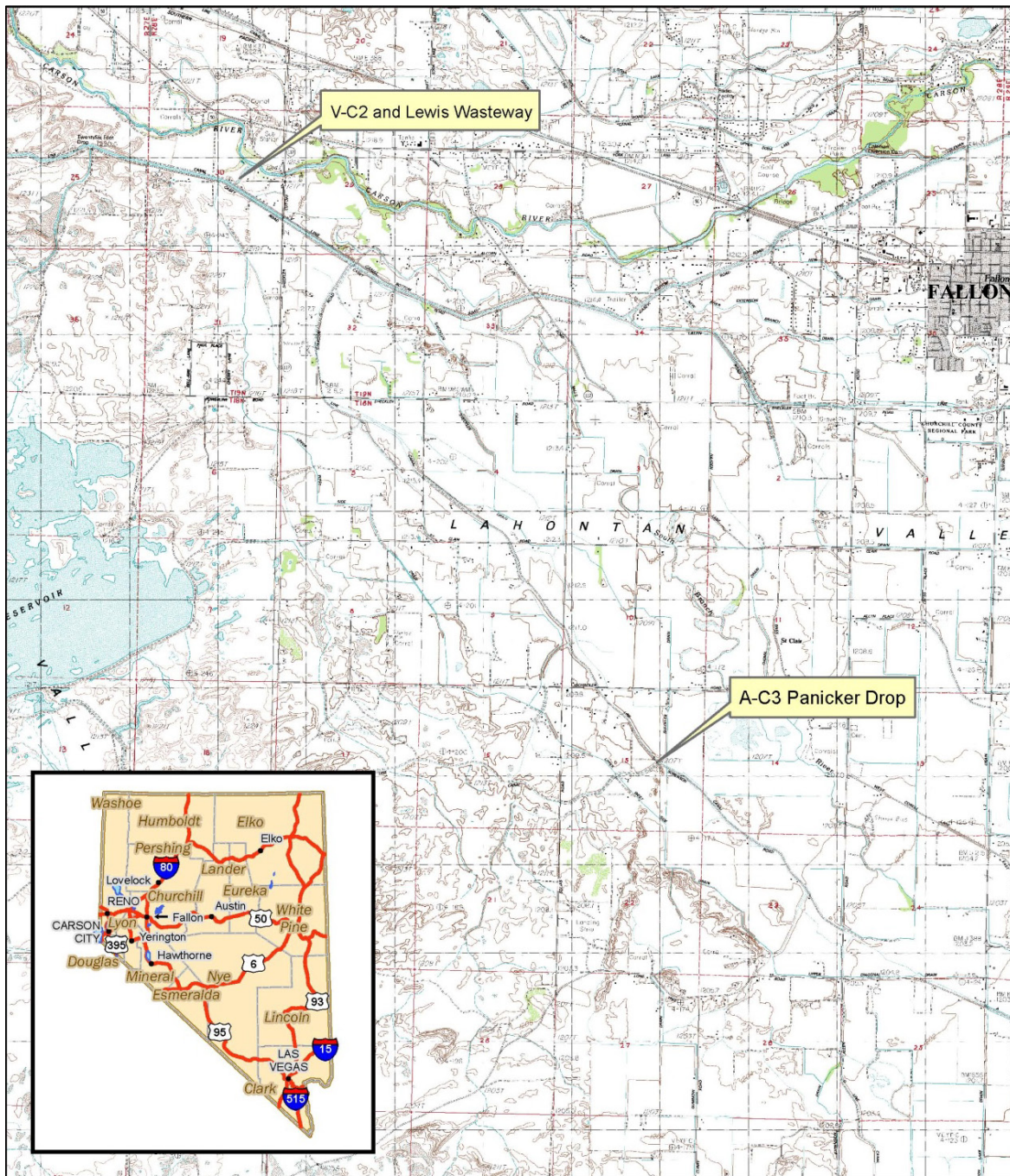


Figure 1 – Vicinity Map – Hydroelectric Plant Locations

The two hydroelectric units would generate power that would be sold back to the existing electrical grid. Revenue generated by the sale of power would provide TCID with a steady source of funding for water system improvements and to offset irrigation costs throughout the irrigation system. Both units would have associated stilling basins at the hydroelectric unit outlets to reduce the water velocity and prevent downstream erosion.

A temporary road across the V-Line Canal would be constructed to allow access for the property owner to the west of the Lewis Wasteway facility and for construction purposes. Each site would have two permanent concrete pads, with associated enclosures, that house the controls, switchgear and pad mounted transformer. The controls include wireless connections to TCID's Supervisory Control and Data Acquisition System (SCADA). In connection with TCID's proposal, the construction and installation of a 1,400-foot single phase power line would be necessary to connect the hydroelectric unit at the A-C3 Panicker Drop location to the NV Energy electrical grid. The electrical connection at Lewis Wasteway would take advantage of existing NV Energy power poles, lines, and related appurtenances. TCID is also proposing to cleanup both sites, which are located on lands and facilities under Reclamation's jurisdiction.

1.2.3 Lewis Wasteway 250 kW Hydroelectric Unit and V-Line Canal Evacuation Flow

The hydroelectric unit at the Lewis Wasteway is located in the Northwest Quarter of the Southeast Quarter of Section 30 Township 19 North Range 28 East of the Mount Diablo Meridian in Churchill County, Nevada (39°28'53.1N, 118°52'56.2"W) and would have a maximum capacity of 250 kW. The proposed modifications to the typical irrigation flows include the replacement of the Lewis Wasteway structure (previously known as VSP-1 (Lewis Spill)) to historic operations. This would allow TCID to take advantage of the flow and vertical drop at the Wasteway to generate power. There would be no consumption of water by the hydroelectric facilities, as the water used for hydroelectric power generation would be incidental to the use of water for Newlands Project purposes. The water in the V-Line Canal upstream of the Lewis Wasteway and V-C2 (Lewis Check) would be the same as historic uses (approximately 660 cfs). The flow using Lewis Wasteway, 60 to 240 cfs (depending upon S-Line Canal demands), would reduce the remaining flow through V-C2. Re-establishment of flow at Lewis Wasteway Channel reduces the flood potential of the V-Line Canal further downstream, and provide a means to evacuate the full flow of the V-Line Canal through the Wasteway as per the original design in case of an emergency event. The hydroelectric facilities would utilize the head and flow provided by the Wasteway structure during the irrigation season (typically March to November – depending upon the availability of water). The inlet of the hydroelectric turbine would be screened to prevent objects (people, animals, debris, etc.) from entering the turbine. The small hydroelectric turbine is designed for outdoor installation, an enclosure would be created to help protect the hydroelectric turbine and associated generator from damage.

Associated with the hydroelectric turbine's inlet and outlet structures are two 48-inch bypass pipelines and a passive overflow structure. The purposes of the bypass pipelines are to:

1. To allow bypass flow around the hydroelectric turbine to Lewis Wasteway if maintenance is required and flow is desired during the irrigation season;
2. Allow free flow of water from the passive overflow structure if the V-Line Canal level exceeds allowable limits;
3. Allow for the evacuation of the V-Line Canal if required for an emergency; and
4. To ensure that a minimum two feet of freeboard along the V-Line Canal is sufficient to avoid an operation error or emergency flood event.

The capacity of the hydroelectric turbine and the two 48-inch bypass pipelines is 784 cfs. The capacity of the hydroelectric unit ranges from 60 to 240 cfs. The passive overflow structure has a maximum capacity of 150 cfs with 9 inches of free board; this coupled with 100 cfs of passive flow through the hydroelectric turbine would prevent any overflows caused by a power outage at the hydroelectric plant. Also, when a prescribed overflow limit has been reached, the automatic control gates for the two bypass pipelines can be opened (automatically or manually) to allow full flow through the bypass (544 cfs).

During construction, a temporary access road would be constructed across the V-Line Canal. The current access for the property owner to the west of the Lewis Wasteway Hydroelectric Project is by Bottom Road. Bottom Road dead ends at the property owner's property. The temporary access road for the property owner to the west would be constructed from the excavated material from the existing embankment. The temporary road would be constructed across the V-Line Canal approximately 125 feet upstream and parallel with V-C2 (Lewis Check) and it would comply with Churchill County road requirements.

The hydroelectric turbine controls and the bypass control gates would be linked to TCID's SCADA system to allow for remote information and alarm notifications. The addition of the SCADA system would help with overall TCID operations, improve conservation efforts, as well as, provide a means to prevent the overflow of the V-Line Canal.

The new stilling basin would reduce the velocity of water exiting the hydroelectric turbine and bypass pipelines. The stilling basin pool would reduce the outlet velocity energy and spread out the flow before it reaches the installed riprap and the existing canal. It is TCID's goal that both the stilling basin design and riprap would prevent erosion during operations of the hydroelectric unit and bypass pipelines.

The improvements would return the Lewis Wasteway back to operation to safely allow passive overflow of the V-Line Canal system if there is a control problem upstream and help allow evacuation of the V-Line Canal system if the V-Line Canal System needs to be evacuated. In summary, the replacement of the Lewis Wasteway structure is needed to improve canal safety, improve overall water use management, decrease water loss and improve the general aesthetics of the Wasteway location. As an added benefit to the restoration of the Lewis Wasteway structure, water incidental to Newlands Project would be used to generate power to provide a revenue source for the care, operation, and maintenance costs associated with existing features within the Newlands Project.

1.2.4 A-C3 Panicker Drop 125 kW Hydroelectric Unit

The hydroelectric unit at the A-C3 Panicker Drop is located in the Southwest Quarter of the Northeast Quarter of Section 15 Township 18 North Range 28 East of the Mount Diablo Meridian in Churchill County, Nevada (39°25'26.0"N, 118°49'31.9"W) and would have a capacity of 125 kW. A 1,400-foot single-phase power line that would connect the hydroelectric unit at the A-C3 Panicker Drop to the electrical grid would be required to be constructed and installed by NV Energy. TCID is also proposing to cleanup this site, which is located on lands, facilities, and water bodies under Reclamation's jurisdiction. No change to the historical operation of irrigation flows is proposed. As previously stated, the hydroelectric unit would allow TCID to take advantage of the flow and vertical drop at the existing check structure to generate power. There would be no consumption of water by the hydroelectric facilities, as the water used for hydroelectric power generation would be incidental to the use of the water for Newlands Project purposes. The purpose of the hydroelectric facilities is to utilize the head and flow provided by the check structure during the irrigation season (typically March to November – depending upon the availability of water). The inlet of the hydroelectric turbine would be screened to prevent objects (people, animals, debris, etc.) from entering the turbine. The small hydroelectric turbine is

designed for outdoor installation, an enclosure would be created to help protect the hydroelectric turbine and associated generator from damage.

The modifications to the existing A-C3 Panicker Drop check structure would be minimized and would not be a permanent Newlands Project feature. The unit is designed to be reversible. Reversible means:

1. The hydroelectric turbine inlet and the screen can be removed to allow for the replacement of the existing check structure without impacting the hydroelectric turbine;
2. The hydroelectric turbine can be bypassed by opening the other existing gates; and
3. The hydroelectric turbine and screen can be removed without impacting the existing A-C3 Panicker Drop check structure.

The new stilling basin, a reinforced concrete structure, would reduce the velocity of the water exiting the hydroelectric turbine and the existing bypass gates. The stilling basin pool would reduce the outlet velocity energy and spread out the flow before it reaches the installed riprap and the existing canal. It is the goal of TCID that both the stilling basin design and riprap installation would prevent erosion on the downstream side of the A-C3 Panicker Drop. The construction at the site would allow for an improvement of the environmental conditions at the site, through localized cleanup of debris that was dumped in the past.

The hydroelectric turbine controls include wireless connections to TCID's SCADA system. A 1,400-foot single-phase power line would be constructed to connect the hydroelectric unit at A-C3 to the NV Energy electrical grid. The power line would be located on the west side of Sorenson Road and would run from the power plant to the NV Energy electrical grid near the corner of Sorenson Road and Sorenson Court.

In summary, the modifications to the A-C3 Panicker Drop are being proposed to improve overall water use management by use of SCADA to conserve water during the irrigation season and using the water incidental to Newlands Project purposes for generating power efficiently in order to provide a revenue source for the care, operation, and maintenance costs associated with existing features within the Newlands Project system.

2.0 PROPOSED ACTION AND NO ACTION ALTERNATIVE

2.1 Proposed Action

Under the proposed action, Reclamation would authorize the installation of a new headworks at the Lewis Wasteway, two small conduit low head hydroelectric units and associated stilling basins a temporary road across the V-Line Canal for the property owner and construction access; and cleanup of both sites which are located on lands and facilities under Reclamation's jurisdiction.

2.1.1 Lewis Wasteway

Under the proposed action, Reclamation would authorize the following:

1. Installation of new wasteway-headworks at Lewis Wasteway, which has three stainless steel gates and an associated overflow bay. The stainless steel gates provide isolation to the 60-inch hydroelectric turbine inlet, and the two 48-inch bypass pipelines.
2. Remove the existing embankment and install a new earthen embankment that meets specific Reclamation design criteria, including, but not limited to: backfill requirements that would allow three conduits to pass through it, as well as, widen and properly grade Bottom Road, which

passes over it. The earthen embankment is designed to maintain the water in the V-Line Canal using an advanced sand filter methodology.

3. After the irrigation season, a temporary access road would be constructed across the V-Line Canal. The current access for the property owner to the west of the Lewis Wasteway Hydroelectric Project is by Bottom Road. Bottom Road dead ends at the property owner's property. Bottom Road measures 15 feet across. The temporary access road for the property owner to the west would be constructed from the excavated material from the existing embankment. The temporary road would be 15 feet wide at the crest and would match the existing elevations at Bottom Road and Casey Road at each end. A 12-inch culvert would be placed under the temporary access road to prevent water accumulation upstream of the road, and allow the contractor to reclaim or dispose of any water that could accumulate. This temporary road would be constructed across the V-Line Canal approximately 125-feet upstream and parallel with V-C2 (Lewis Check) and it would comply with Churchill County road requirements. The temporary road would be compacted to 90% or better with 15% moisture content (ASTM D 1557). The compaction would be completed with the excavator on site, a backhoe with a bucket for grading, a water truck and sheep's foot vibrator. Signage would be posted to warn the public that the temporary road is not a through road and is for residential access only. Fiberglass reflectors would be located on each side of the temporary access road crossing to help ensure no one drives off of the road. During temporary road construction the property owner to the west will be able access their property via the next property owner to the west.
4. Install a passive overflow structure that would allow flow from the V-Line Canal to pass through two 48-inch bypass pipelines to Lewis Wasteway in the event that the V-Line Canal level rose above the 4003.5 foot elevation mark. This leaves two feet of freeboard prior to the canal overflowing the adjacent roads (Bottom Road and Casey Road). The reinforced concrete used in the new inlet/passive overflow and the hydroelectric structure would use premixed concrete to prevent a cement dust problem. The reinforced concrete inlet structure is 45 feet long by 16 feet wide and 16 feet deep.
5. Install stainless steel gates that can open automatically, or manually, given a certain flow sensor reading in the passive overflow bay to allow full flow through the two 48-inch bypass pipelines.
6. Link to TCID's SCADA to allow for remote information and alarm notifications. The hydroelectric control system would take advantage of the wireless SCADA system that already exists within TCID. No phone lines would be required. The new transformer and control system pads at the site measures 4 feet by 6 feet. The cabinets that house the pad mounted transformer and control system measures 3 feet x 5 feet at the base and are 6 feet tall.
7. Install a 250 kW hydroelectric unit and related appurtenances at the Lewis Wasteway. The reinforced concrete hydroelectric structure is 20 feet long by 16 feet wide and 16 feet deep.
8. Install a stilling basin that would slow the water velocity from the hydroelectric unit and associated bypass pipelines to minimize downstream canal erosion. The reinforced concrete stilling basin structure is 32 feet long by 32 feet wide and 10 feet deep.
9. Backfill and compact the embankment per the approved design specifications using materials from a commercial source.
10. Remove and reinstall riprap on the V-Line Canal associated with the construction of the new Wasteway-Head structure. Regrade and replace riprap at a 2:1 slope and blend the riprap with the existing V-Line Canal riprap. The riprap would be recycled from the existing canal slopes or would be purchased from a commercial source. Approximately 1400 square feet of riprap would be removed and then reinstalled.
11. Backfill, compact and place gravel on the southwest corner of the Lewis Wasteway that was eroded away during the 2008 structure failure. Grade to match the opposite corner (adjacent to the newly graded Bottom Road and parallel with the V-Line Canal). The restored corner amounts to 400 square feet.

12. Install riprap 20 feet downstream of the stilling basin to further reduce erosion to the Lewis Wasteway from the outflow of the hydroelectric unit and the bypass pipelines. The riprap would be recycled from the existing canal or would be purchased from a commercial source. Approximately 1270 square feet of riprap would be removed and then reinstalled.
13. Remove the temporary road from the V-Line Canal and restore back to its pre-construction condition when construction is complete. This includes any compaction and riprap restoration necessary.
14. Remove and properly dispose of construction debris. Remove and properly dispose of the debris from the original Wasteway structure failure in 2008.

The locations of these project elements are shown in Figure 2 below:

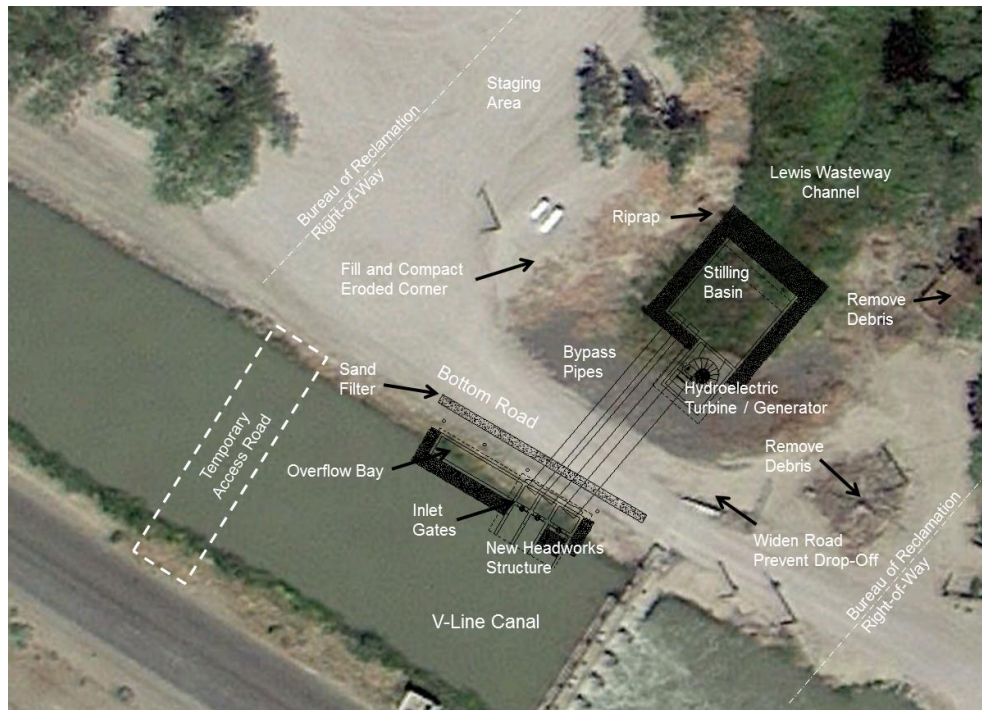


Figure 2 – New Lewis Wasteway Headworks Structure and Hydroelectric-Turbine Location

2.1.2 A-C3 Panicker Drop

Under the proposed action, Reclamation would authorize the following modifications:

1. Remove the existing gate on the west inlet, and reinstall it on the east inlet where the existing slot boards are located.
2. Install a new stainless steel gate on the west inlet of the check structure. The existing structure has three inlets (west, middle and east).
3. Install a footing and a screened inlet in front of the west inlet of the check structure.
4. Install a 125 kW hydroelectric unit and related appurtenances. The reinforced concrete hydroelectric structure is 12 feet long by 11 feet wide and 14 feet deep.
5. Link to TCID's SCADA to allow for remote information and alarm notifications. The hydroelectric control system would take advantage of the wireless SCADA system that already exists within TCID. No phone lines would be required. Install new transformer and control system pads that measure 4 feet by 6 feet. The cabinets that house the pad mounted transformer and control systems measures 3 feet by 5 feet at the base, and are 6 feet tall.

6. Install a reinforced concrete stilling basin that would slow the water velocity from the hydroelectric unit and associated bypass gates to minimize downstream canal erosion. The stilling basin structure is 31 feet long by 27 feet wide and 4 feet deep.
7. Install a 42-inch inlet pipe from the west inlet to the hydroelectric turbine.
8. Removal, reinstallation, and installation of riprap on the sides and downstream of the stilling basin to prevent downstream canal erosion. The riprap would be recycled from the existing canal or would be purchased from a commercial source. The riprap extends 20 feet past the stilling basin. The additional riprap is approximately 900 square feet.
9. The contractor would obtain the right of way and install a single phase power line from the hydroelectric unit 1,400 feet northwest (6 – 35 foot power poles, 6 feet into the ground, 1 conductor / 1 ground run overhead), along Sorenson Road, to the NV Energy electrical grid near the corner of Sorenson Road and Sorenson Court. The power poles would be installed on the west side of the road.
10. Cleanup the site located on lands, facilities, and water bodies under Reclamation's jurisdiction.

The locations of these project elements is shown in Figure 3 below:



Figure 3 – A-C3 Panicker Drop Check Structure / Hydroelectric-Turbine Location

2.2 No Action

Under the “No Action” alternative, the following proposed actions would **not** be implemented:

1. A LOPP or Permit would not be issued to TCID by Reclamation.
2. The proposed new headworks, with its associated gates, bypass and overflow bay, at Lewis Wasteway would not be installed.
3. The hydroelectric unit and related appurtenances would not be installed at Lewis Wasteway.
4. The V-Line Canal would not be able to be evacuated by Lewis Wasteway in an emergency, until the works are replaced.
5. No passive overflow protection for the V-Line Canal would be implemented.
6. No cleanup of the debris from the Lewis Wasteway failure in 2008 would occur.
7. No improvements would be made to Bottom Road near the Lewis Wasteway Channel.

8. No repair of erosion damage to the Lewis Wasteway after the failure in 2008 would occur.
9. The hydroelectric unit and related appurtenances would not be installed at A-C3 Panicker Drop.
10. No cleanup of the debris found in and around A-C3 Panicker Drop would occur.

3.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

3.1 Site Descriptions

3.1.1 Lewis Wasteway

The Newlands Project Carson River Diversion Dam is on the Carson River 5 miles below Lahontan Dam. The dam diverts water into two main canals to irrigate Carson Division lands. The Carson River Diversion Dam is 241-feet long with a 225 foot long by 31-foot high, concrete control section. Construction was completed in 1906.

Two canals carry water from the Carson River Diversion Dam to project lands. The T-Line Canal serves lands on the north side of the river. It is 9 miles long with a bottom width of 10-feet, and has a capacity of 450 cfs. The V-Line Canal serves lands on the south side of the river and is 27 miles long. The original design width ranged from 13 to 22 feet and the current capacity is 660 cfs.

The first check structure on the V-Line Canal is 5.75 miles from the start and called 26 Foot Drop, V-C1. TCID produces power with the flow in the V-Line Canal and the head produced by the 26-foot drop. Two 400 kW hydroelectric turbines are at the site and operate during the irrigation season.

An additional 1.15 miles down the V-Line Canal is the V-C2. The empty V-Line Canal and the V-C2 is shown in Figure 4. The V-C2 regulates flow for users downstream on the V-Line Canal. To the west of V-C2 was Lewis Wasteway. In July, 2008, leakages in the Lewis Wasteway system lead to the undermining and eventual failure of the Wasteway headworks structure. The V-Line Canal emptied into Lewis Wasteway resulting in no irrigation flow to farmers downstream of V-C2. In a cooperative effort between Reclamation, TCID, and local volunteer water users an embankment was constructed in eight days effectively blocking flow from the V-Line Canal to Lewis Wasteway, see Figure 5.

Historically, diverting flow through the Lewis Wasteway helped evacuate the V-Line Canal and prevent potential flooding in the Fallon area. If Lahontan Reservoir needed to be drawn down in the winter (precautionary draw down for flood control) the water was allowed to pass down the V-Line Canal, through the power plants at 26 Foot Drop, and then through the Wasteway and back into the Carson River.

The proposed hydroelectric plant at Lewis Wasteway would allow TCID to take advantage of the flow and vertical drop at the Wasteway to generate power. There would be no consumption of water by the hydroelectric facilities, as the water used for hydroelectric power generation would be incidental to the use of water for Newlands Project purposes. The water in the V-Line Canal upstream of the Lewis Wasteway and the V-C2 (Lewis Check) would be the same as historic operations (approximately 660 cfs). The flow using Lewis Wasteway, 60 to 240 cfs is dependent upon S-Line Canal water demand and would reduce the remaining flow through the V-C2. Re-establishing the V-Line Canal flow at Lewis Wasteway may reduce the potential for flooding of the V-Line Canal further downstream near Fallon. In an emergency, the full flow of the V-Line Canal can be passed through the proposed Lewis Wasteway structure and Hydroelectric Plant to the Lewis Wasteway Channel.



Figure 4 V-C2 Lewis Check – Canal Empty



Figure 5 Lewis Wasteway Levee

3.1.2 A-C3 Panicker Drop

Approximately 1 mile downstream from the V-C2 is the V-C3. The V-C3 provides the head for the A-Line Canal. The A-Line Canal starts at V-C3 near the intersection of Casey Road and Strasdin Lane. The A-Line Canal serves the southern part of the District. A-C3 Panicker Drop is located approximately 4.5 miles from the start of the A-Line Canal.

A-C3 Panicker Drop is a reinforced concrete structure that has been in place since the beginning of the Newlands Project. The structure is in fairly good condition. A-C3 has three gate openings that are 5 feet wide by 3 feet tall. The west gate is equipped with a hand wheel operated undershot slide gate, the middle gate is a hand wheel operated undershot radial gate, and the east gate employs slot boards to regulate flow. From the top of the structure to the top of the downstream base is 17 feet 3 inches. The flow ranges from 85 to 125 cfs during the irrigation season.

Figure 6 shows an upstream view of the gates and Figure 7 shows a downstream view of the same gates.



Figure 6 A-C3 Panicker Drop Upstream View



Figure 7 A-C3 Panicker Drop Downstream View

3.2 Affected Environment / Environmental Consequences

After initial analysis, it was determined that the proposed action would not affect climate, geology, mineral resources, land use, and coastal zones. Therefore, these resources are not considered in detail in this Draft EA.

The “No Action” alternative could have no environmental effects. The facilities discussed in the proposed project would remain in their current condition and would continue to operate as they currently do.

3.2.1 Wildlife

Lewis Wasteway Affected Environment

The Nevada Department of Wildlife (NDOW) was contacted regarding the proposed project elements at the Lewis Wasteway. NDOW delineated an area of interest that included a four-mile buffer around the proposed project area. Based on that area of interest, NDOW provided information regarding wildlife known to reside in the vicinity. Sensitive wildlife in the vicinity includes various species of raptors. Of those, bald eagle, ferruginous hawk, golden eagle, northern goshawk, peregrine falcon, and short-eared owl are listed as NDOW species of special concern and are target species for conservation as outlined by the Nevada Wildlife Action Plan.

The following species have also been observed in the vicinity of the project area:

American kestrel	Great horned owl	Prairie falcon
Barn owl	Merlin	Red-tailed hawk
Cooper's hawk	Northern harrier	Rough-legged hawk
Osprey	Sharp-shinned hawk	Western screech-owl
Nevada viceroy	Northern leopard frog	Pygmy rabbit
Yuma myotis	Swainson's Hawk	Burrowing owl

Table 1

Lewis Wasteway Hydroelectric Unit Environmental Consequences

Proposed Action

Consequences to wildlife resources generally result from impacts to individuals, populations, or from disturbance to habitat. Most potential impacts to wildlife are associated with habitat disturbance and vegetation removal.

In the Lewis Wasteway case, most of the work is done in an area that wildlife does not inhabit. In order to maintain the integrity of the levee, the banks of the V-Line Canal have been kept clean with a rock riprap and efforts have been made to prevent wildlife from using the banks, see Figures 1, 3 and 4. On the Lewis Wasteway side of the V-Line Canal embankment the slope has been protected with a gravel fill, which has prevented vegetation from growing, maintaining the integrity of the levee. At the bottom of the bank on the Lewis Wasteway side of the V-Line Canal levee, heavy vegetation has established itself in the bottom of the canal, see Figure 7. The replacement of Lewis Wasteway would allow for the removal of approximately 900 square feet of the heavy vegetation, mostly cattails, crab grass and weeds, and replace it with the hydroelectric unit, the stilling basin and associated riprap, see Figures 1 and 7.

Because the proposed action area of effect includes the interior and embankments of the irrigation canals, minor wildlife impacts are expected.

A potential benefit to wildlife may occur due to water being conveyed through Lewis Wasteway, to the Carson River, and then to the S-Line Canal, instead of the current practice of conveying the S-Line Canal diversions all of the ways down the V-Line Canal to the S-Line Canal. The additional water in the Carson River may have a potential benefit to wildlife.

There are no anticipated long-term environmental consequences associated with wildlife in the vicinity of Lewis Wasteway project under the proposed action. There would be temporary localized environmental effects during the construction process. These may include equipment exhaust emissions, noise, runoff, and fugitive dust. However, Best Management Practices (BMP's) would minimize these effects.



Figure 8 Project Area View of Lewis Wasteway

No Action

The “No Action” alternative would not restore the habitat that was in place when the Lewis Wasteway was still in use. Local property owners have reported that waterfowl and fish used to occupy the Lewis Wasteway area. All facilities discussed in the proposed action would remain in their present condition and would continue to operate as they currently do.

A-C3 Panicker Drop Hydroelectric Unit Affected Environment

NDOW was contacted regarding the proposed project elements at the A-C3 Panicker Drop. NDOW delineated an area of interest that included a four-mile buffer around the proposed project area. Based on that area of interest, NDOW provided information regarding wildlife known to reside in the vicinity. Sensitive wildlife in the vicinity includes various species of raptors. Of those, bald eagle, ferruginous hawk, golden eagle, northern goshawk, peregrine falcon, and short-eared owl are listed as NDOW species of special concern and are target species for conservation as outlined by the Nevada Wildlife Action Plan.

The following species have also been observed in the vicinity of the project area:

American kestrel	Great horned owl	Prairie falcon
Barn owl	Merlin	Red-tailed hawk
Cooper's hawk	Northern harrier	Rough-legged hawk
Osprey	Sharp-shinned hawk	Western screech-owl
Harlan's hawk	Swainson's Hawk	Burrowing owl
Red-shouldered hawk	Pygmy rabbit	Northern leopard frog
Yuma myotis		

Table 1

A-C3 Panicker Drop Hydroelectric Unit Environmental Consequences

Proposed Action

In the A-C3 Panicker Drop case, most of the work is done in and near the existing check structure and canal. The embankments of the A-line Canal, downstream of the check structure, need repair. Concrete blocks and debris have been dumped on-site and need to be cleaned up. Riprap needs to be restored on the embankments of the canal downstream of A-C3 to prevent erosion. Wildlife does not inhabit the area where the proposed inlet screen and the hydroelectric unit would be constructed. The proposed stilling basin and riprap would have a positive effect on the canal downstream of the check structure; see Figure 3, by reducing the flow velocity, which would prevent erosion. Figures 6 and 7 portray views upstream and downstream of the check structure located within the A-Line Canal. The hydroelectric unit would be located toward the left of Figure 7.

The 1,400-foot single-phase power line would extend from the hydroelectric unit to the electrical grid along Sorenson Road. The power line would consist of six 35-foot long power poles, buried 6 feet deep, with an overhead conductor and ground wire.

Because the proposed action area of effect includes the interior and embankments of the irrigation canal, with a minimal footprint, no wildlife impacts are expected.

There are no anticipated long-term environmental consequences associated with wildlife in the vicinity of A-C3 Panicker Drop project under the proposed action. There would be temporary localized environmental effects during the construction process. These may include equipment exhaust emissions, noise, and fugitive dust. However, these effects would be minimized by BMPs as described in the "State of Nevada Best Management Practices Handbook". BMP's include but are not limited to equipment maintenance, weed control, erosion control, dust suppression and site restoration.

No Action

The "No Action" alternative would not affect wildlife at A-C3 Panicker Drop. All facilities discussed in the proposed action would remain in their present condition and would continue to operate as they currently do.

3.2.2 Threatened and Endangered Species

Lewis Wasteway and A-C3 Panicker Drop Affected Environment

According to the U.S. Fish and Wildlife Service there are no listed species under the Endangered Species Act of 1973 (Act), as amended, in Churchill County, Nevada (U.S. Fish and Wildlife Service, 2014) that

would be impacted by the proposed action or are known to occur within the project area. Due to the fact that the canals are dry for several months during the year, they are not a reliable habitat for fish and other aquatic species.

Lewis Wasteway and A-C3 Panicker Drop Environmental Consequences

There are no environmental consequences for either alternative since there are no threatened and endangered species occupying these areas.

3.2.3 Water Resources

Water stored in Lahontan Reservoir is released into the Carson River through the Lahontan Power Plants and is diverted into the V-Line Canal, T-Line Canal, and the Carson River at the Carson River Diversion Dam for irrigation of the Carson Division. Two main canals carry water from the Carson River Diversion Dam to Newlands Project lands. The T-Line Canal serves lands on the north side of the river. It is nine miles long with a bottom width of 10 feet, and has a capacity of 450 cfs. The V-Line Canal serves lands on the south side of the river and is 27 miles long. The original bed width of the canal varied from 22 feet at the head works down to 13 feet at the end.

For the TCID Low Head Hydroelectric Project there would be no consumption of water by the hydroelectric facilities, as the water used for hydroelectric power generation would be incidental to the use of water for Newlands Project purposes.

The water in the V-Line Canal upstream of Lewis Wasteway and V-C2 (Lewis Check) would be the same as historic uses (approximately 660 cfs). The flow using Lewis Wasteway, 60 to 240 cfs (depending upon S-Line Canal demand), would reduce the remaining flow through V-C2. Re-establish of the V-Line Canal flow at Lewis Wasteway reduces the flood potential of the V-Line Canal further downstream, and additionally, in emergencies it would be possible to divert the full flow of the V-Line Canal through the Wasteway as per the original design (660 cfs). The hydroelectric facilities would utilize the head and flow provided by the Wasteway structure during the irrigation season (typically March to November – depending upon the availability of water).

At the A-C3 Panicker Drop location, no changes to the historical irrigation flows are proposed. As previously stated, the hydroelectric unit would allow TCID to take advantage of the flow and vertical drop at the existing check structure to generate power. There would be no consumption of water by the hydroelectric facilities, as the water used for hydroelectric power generation would be incidental to the use of the irrigation water for Newlands Project purposes. The purpose of the hydroelectric facilities is to utilize the head and flow provided by the check structure during the irrigation season (typically March to November – depending upon the availability of water).

Lewis Wasteway and A-C3 Panicker Drop Hydroelectric Unit Affected Environment

The use of the Lewis Wasteway would allow project water to travel from the V-Line Canal to Lewis Wasteway to the Carson River to the S-Line Canal, instead of project water deliveries being made from the V-Line Canal directly to the S-Line Canal. The V-Line Canal to Lewis Wasteway to the Carson River to the S-Line Canal is a shorter route and may prove to be more efficient. Minor water efficiencies may be gained at the A-C3 due to improved control of flow using the hydroelectric turbine.

No agricultural water rights would be affected by this project. Two new non-consumptive water rights would be obtained by TCID for the proposed hydroelectric units. The hydroelectric units do not consume

any water. The project would allow for better management of existing water resources by use of power generation technologies.

The automation elements of the project using a SCADA system would improve the ability to coordinate water releases. The releases would be synchronized with downstream agricultural demands/deliveries. In summary, the improved control at the Lewis Wasteway and the A-C3 Panicker Drop would allow for better water use practices including conservation.

The benefit of the hydroelectric turbines would be the capture of green energy. The initial revenue from the power generation would be used to pay for one-third of the project cost and the other two-thirds being funded by a rebate from NV Energy.

Lewis Wasteway and A-C3 Panicker Drop Hydroelectric Unit Environmental Consequences

Proposed Action

Construction of the hydroelectric power units, their related appurtenances and stilling basins would have no detrimental effect on water resources. Instead of the water moving from the inlet gates to the outlets of the structure, the water would pass from the inlet gates, through the hydroelectric turbines, to the outlets of the structure. The hydroelectric turbine removes the energy from the water and does not consume any water. To an observer looking 50 feet upstream or 50 feet downstream of the unit there would be no noticeable change in the water. There may be less turbidity in the water due to the establishment of the stilling basin and the addition of additional riprap, reducing the erosive effects of the water falling 14 to 16 feet. The proposed design would ensure that the quantity and quality of water discharged from the hydroelectric units would be the same as it is currently, or historically is in the case of Lewis Wasteway.

During the installation process, BMPs as described in the “State of Nevada Best Management Practices Handbook” would be employed to insure that any debris generated during the installation process would not impact water resources – the canals will be empty. Therefore, the installation of the hydroelectric turbine would not affect water resources. BMPs include but are not limited to sediment fences, straw wattles, and other sediment barriers.

Once the turbines are installed, they would be in contact with the water released from the head structure. There are components of the hydroelectric turbine that would be lubricated. These include a gearbox and bearings that would come in contact with the water but are mechanically sealed (gaskets, etc.). Also, lubrication used in the turbine would be vegetable based and under normal operating conditions would not come in contact with the flow. Any lubrication that might come in contact with the water due to leaks caused by normal wear would be in small amounts compared to the flow and would be quickly diluted, posing no threat to wildlife. Additionally, maintenance on the gearbox can be done under non-flow conditions which would prevent water contamination by lubricants during maintenance.

Other proposed appurtenant equipment to be installed would have no effect on water resources.

The “No Action” alternative could have an effect if flooding that could have been avoided by the use of the Wasteway occurs. Additionally, even though TCID would remain as it is and would continue to operate as it currently does, the potential for the anticipated water conservation associated with the proposed action would not be realized.

No Action

In general, under a “No Action” alternative, there would be no environmental consequences regarding water resources for any of the facilities. All facilities would continue to function as they do currently.

3.2.4 Air Quality

Lewis Wasteway and A-C3 Panicker Drop Hydroelectric Unit Affected Environment

The National Ambient Air Quality Standards (NAAQS) published by USEPA in 40 CFR Part 50 define the levels of air quality that USEPA has determined to protect human health and welfare. An area is considered to be in nonattainment for a pollutant if it violates a particular NAAQS. Conversely, attainment areas are those where monitoring shows that no violations of the NAAQS have occurred. An area is considered unclassifiable if no monitoring has been conducted to determine its classification and NAAQS violations would not otherwise be expected. Churchill County is classified as an attainment area and all of the proposed action is located within Churchill County.

Lewis Wasteway and A-C3 Panicker Drop Hydroelectric Unit Environmental Consequences

Proposed Action

The construction of the inlet works at Lewis Wasteway and the hydroelectric units and stilling basins at both locations would require excavation and consequently fugitive dust would be generated. According to the Nevada Division of Environment Protection (NDEP) Bureau of Air Quality Planning, if an area in excess of five (5) acres is disturbed, a surface area disturbance permit is required. The total area to be disturbed over the course of the project is less than 0.5 acres.

Also, regardless of the size of the disturbed area, fugitive dust emissions must be controlled at all times through the use of BMPs as described in the “State of Nevada Best Management Practices Handbook”. BMP’s include but are not limited to equipment maintenance, dust suppression, and site restoration. Most of the soil disturbance associated with the project would occur during the replacement of the Lewis Wasteway inlet structure, earthen levee, hydroelectric unit and stilling basin – approximately 0.35 acres. In summary, there is the potential for temporary, localized impacts on air quality associated with fugitive dust generated during construction and emissions from construction equipment.

Fugitive dust generated during construction would be controlled by best management practices including watering. Emissions from construction equipment would be temporary and insubstantial and would not result in violations of national or state ambient air quality standards. No air quality issues are anticipated post construction.

No Action

There would be no air quality environmental consequences associated with the “No Action” alternative since no work would be performed.

3.2.5 Noise

Lewis Wasteway and A-C3 Panicker Drop Hydroelectric Unit Affected Environment

There is traffic noise near the both locations since they all have vehicular roads next to their associated embankments. Both the Lewis Wasteway and the A-C3 Panicker Drop have dirt roads that allow

vehicular traffic. Vehicular traffic on the dirt roads would be considered light and the relative loudness of light auto traffic at 100 feet is approximately 50 decibels (dBA) ((Beranek (1988) and EPA (1971)).

Noise level drops 6 dBA when distance doubles. For example, if the noise at the hydroelectric unit is 85 dBA, 10 feet away it is approximately 79 dBA. The table below illustrates:

Hydroelectric plant noise at 85 dBA	
Distance from Noise Source (ft)	Noise level at that distance (dBA)
10	79
20	73
40	67
80	61
160	55
320	49
640	43

The residences nearest to the Lewis Wasteway headworks are approximately 100 and 150 feet away. According to the chart, the sound at those distances the estimated sound would be 61 and 55 respectively. The property owner nearest to the A-C3 Panicker Drop is approximately 600 feet away. The estimated perceived sound 600 feet away would be 45 dBA. Noise at 60 dBA is comparable to conversation in restaurant, office, background music, or air conditioning unit at 100 ft. Noise at 50 dBA is comparable to a quiet suburb, conversation at home, or Large electrical transformers at 100 ft. Noise at 40 dBA is comparable to a library, bird calls (44 dB), or the lowest limit of urban ambient sound. (Temple University Department of Civil/Environmental Engineering (www.temple.edu/departments/CETP/environ10.html), and Federal Agency Review of Selected Airport Noise Analysis Issues, Federal Interagency Committee on Noise (August 1992). Source of the information is attributed to Outdoor Noise and the Metropolitan Environment, M.C. Branch et al., Department of City Planning, City of Los Angeles, 1970.)

In addition to the reduction in sound due to distance, the hydroelectric units would be installed at the invert of the canals, with embankments on three sides providing natural barriers. Effective noise barriers typically reduce noise levels by 5 to 10 dBA. For a barrier to be effective, it must cut the line of sight between the noise source and the potentially affected area. This requirement is satisfied since the units would not be visible unless you are directly above them. Barriers can be formed from earth mounds or "berms", from high, vertical walls, or from a combination of earth berms and walls. Earth berms have a very natural appearance and are usually attractive. They also reduce noise by approximately 3 dB more than vertical walls of the same height (U.S. Department of Transportation, Federal Highway Administration, fhwa.dot.gov/environment/noise/noise_barriers/design_construction/keepdown.cfm).

The Low Head Hydroelectric Power Plants are expected to operate 24 hours a day, seven days a week, during the irrigation season (typically March through November – depending upon the availability of water). After the hydroelectric turbines are built, the noise level would be monitored 100 feet from the operating units, additional noise mitigation may be taken if discrete mechanical frequencies are louder than 65 dB. The normal ambient noise level near the present check structures (A-C3 and V-C2), while spilling water is 75 to 80 dB.

Lewis Wasteway and A-C3 Panicker Drop Hydroelectric Unit Environmental Consequences

Proposed Action

Both of the proposed project sites would experience a temporary increase in noise due to construction activities. However, the amount of construction equipment for these projects would be minimal and brief. Construction at both sites may include an excavator and a loader or backhoe. Installation of the hydroelectric turbine generator equipment would require a crane.

Assuming a peak of 85 dBA, the above analysis predicts that the sound produced by the hydroelectric unit at the Lewis Wasteway would be approximately 40 to 50 dBA in the yard of the nearest residence. It is anticipated that sound of water being released from the V-Line Canal check structure could produce potentially more noise than the proposed hydroelectric unit. This is because it does not have the advantage of a barrier and is visible from the houses (line of sight). An additional consideration is that the peak of 85 dBA would not be continuous and may even be rare. Regarding the noise at the A-C3 Panicker Drop, it would not be heard by the local residents.

The noise produced by the automated gates would be less than that of a vehicle passing by the head structures.

No Action

No additional noise would be produced under the “No Action” alternative and so there would be no environmental consequences.

3.2.6 Vegetation

Lewis Wasteway and A-C3 Panicker Drop Hydroelectric Unit Affected Environment

The dominant habitat type near each project location is alfalfa hay fields. Where farming is not actively being done there are patches covered with sagebrush, shadscale saltbush, rabbitbrush, and black greasewood. There are also locations near the project areas with no vegetation.

In the Lewis Wasteway channel bed, approximately 900 square feet of vegetation would be removed and replaced with the hydroelectric unit and the stilling basin. In the channel bed there are Fremont cottonwood, narrow-leaved willow, weeds and crabgrass. This riparian scrub-forest habitat is patchy and disturbed, and has been heavily invaded by weeds and crabgrass.

The vegetation adjacent to the A-C3 is mostly weeds and crabgrass and would be removed and replaced by the hydroelectric unit, stilling basin and appropriate riprap. The effected vegetation is approximately 400 square feet.

Lewis Wasteway and A-C3 Panicker Drop Hydroelectric Unit Environmental Consequences

Proposed Action

There is some potential for weeds to infest areas where the soil and existing vegetation would be disturbed. Areas of the project where the soil would be disturbed include approximately 0.35 acres. Implementation of noxious weed BMPs would prevent the spread of invasive plant species in these areas. BMPs include but are not limited to utilization of certified weed free fill material, all off-road equipment will be cleaned (power or high-pressure cleaning) of all mud, dirt, and plant parts prior to immobilization

onto lands under Reclamation's jurisdiction, and disturbance to areas infested with noxious weeds will be avoided to the greatest extent possible.

No Action

No vegetation or soil would be disturbed under the "No Action" alternative and so there would be no environmental consequences.

3.2.7 Hazardous Materials

Lewis Wasteway and A-C3 Panicker Drop Hydroelectric Unit Affected Environment

None of the proposed project sites has facilities that store or use hazardous materials.

Lewis Wasteway and A-C3 Panicker Drop Hydroelectric Unit Environmental Consequences

Proposed Action

Construction of the various project elements would involve the use of common hazardous materials, including, but not limited to, fuel, such as diesel and gasoline, oil, and lubricants. A spill prevention and handling plan will be submitted to Reclamation prior to issuance of the LOPP. To reduce the risk of the release of any pollutants, the following BMPs would be implemented:

- Gasoline, oil, and lubricants would be transported in approved containers in accordance with National Fire Protection Association Code,
- Sorbent material would be maintained on site to absorb petroleum products spills occurring during construction.

The risk of using routine hazardous materials during project construction would be minimal therefore, the potential risk for contamination is remote. Again, mitigation measures and BMPs would be incorporated while construction and maintenance activities are in progress. If an accident or spill were to occur, the construction crew would have absorbent materials readily available to immediately respond and thereby prevent significant impacts on soil, surface water, or groundwater.

If during construction, contaminated soil is encountered, the project would be delayed while the contaminated material is evaluated and removed.

No Action

No hazardous materials would be transported or used under the "No Action" alternative and so there would be no environmental consequences.

3.2.8 Visual Resources

Lewis Wasteway and A-C3 Panicker Drop Hydroelectric Unit Affected Environment

The visual environment found in the vicinity of both sites is similar. Near both locations there are homes, agricultural fields, hay barns, power poles, fences, and the landscape is generally flat. There is a dirt road adjacent to each site that allows vehicular traffic, which tends to be infrequent. The surrounding landscape near both locations appears heavily disturbed. The two homes adjacent to the Lewis Wasteway are 100 feet and 150 feet from the proposed hydroelectric unit. The closest home to the A-C3 is 600 feet from the proposed hydroelectric unit. Figure 9 shows an aerial view of both locations.



Figure 9 Aerial Views of Both Project Locations

Lewis Wasteway and A-C3 Panicker Drop Hydroelectric Unit Environmental Consequences

Proposed Action

The most significant visual change would occur at the inlet of the Lewis Wasteway. The inlet works are 12 inches above the top of the canal crest and the three gate operators are located 3 feet above the concrete. Both hydroelectric units and their associated stilling basins are located inside and below the canal bank. Unless one is standing at the head structure, it is unlikely that one would see the hydroelectric unit. The appurtenances associated with the hydroelectric units (e.g. controls and switchgear) would be located on top of the canal bank, would take up an area of 48 square feet and stand 6 feet tall.

The power poles for the hydroelectric unit at the Lewis Wasteway are already in place. The six power poles that are needed for the A-C3 would be placed 240 feet apart, stand 35 feet tall and would be located west side of the dirt road that parallels the A-Line Canal (Sorenson Road).

The visual impacts of the hydroelectric units and the power line at A-C3 would be minor and would not affect the general appearance of the area.

No Action

Modifications to the existing structures would not occur under the “No Action” alternative. The existing structures would continue to appear as they currently do and so there would be no environmental consequences.

3.2.9 Transportation

Lewis Wasteway and A-C3 Panicker Drop Hydroelectric Unit Affected Environment

Bottom Road is a dirt road that passes over the embankment that was constructed at the Lewis Wasteway site. Access is from Sheckler Cutoff approximately 0.5 miles away. The section of Bottom Road over the Lewis Wasteway is in need of repair. Just to the west of the Lewis Wasteway, the road is concave and results in some vehicles becoming high centered as they attempt to pass over the embankment. At this location, the dirt road is narrow and the concrete drop off presents an unprotected hazard, see Figure 10.



Figure 10 Lewis Wasteway – Bottom Road

Sorenson Road, the dirt road that runs next to the A-C3 Panicker Drop and the A-Line Canal, is in fair condition. Access is from Schindler Road approximately 0.64 miles away.

Lewis Wasteway and A-C3 Panicker Drop Hydroelectric Unit Environmental Consequences

Proposed Action

Transportation on Bottom Road at Lewis Wasteway would be affected during construction of the head works and bypass pipelines. A temporary road would be constructed across the V-Line Canal after the irrigation season to allow the property owner to the west access to their property during construction. Bottom Road is not a through road and it dead-ends 1000 feet to the west of Lewis Wasteway. A barricade would be set up at Bottom Road to prevent pass through access of the construction site during construction. Though traffic would be minimal (limited typically to the property owner to the west), traffic control standards would be maintained through project completion.

When the temporary road is removed, the V-Line Canal banks would be restored. The riprap on the V-Line Canal associated with the construction would be restored like the new Wasteway-Head structure. Regrade and replace riprap at a 2:1 slope and blend the riprap with the existing V-Line Canal riprap. The riprap would be recycled from the existing canal slopes or would be purchased from a commercial source.

Traffic on Sorenson Road near the A-C3 is infrequent. Traffic may be interrupted temporarily by construction activities. Traffic control standards would be maintained until project completion. Otherwise, the proposed action would not affect Sorenson Road near the A-C3.

All legal access to private property would be obtained prior to construction activities. Land status and easements would be shown on project drawings.

No Action

Transportation would not be affected under the “No Action” alternative since no work would be performed on the facilities.

3.2.10 Indian Trust Assets

Lewis Wasteway and A-C3 Panicker Drop Hydroelectric Unit Affected Environment

Indian Trust Assets (ITAs) are legal interests in property held in trust by the United States for Indian Tribes or individuals. The Secretary of the Interior, acting as the trustee, holds many assets in trust. Examples of objects that may be trust assets are lands, minerals, hunting and fishing rights, and water rights. While most ITAs are on reservations, they may also be found off-reservations.

The Pyramid Lake Paiute Tribe is located near the town of Fernley, Nevada and the Fallon Paiute Shoshone Tribe is located near the town of Fallon, Nevada. There are no ITAs at either of the proposed project sites however, the Newlands Project receives supplementary water from the Truckee River via the Truckee Canal. Both tribes have an interest in the proper management of the Truckee Canal and the Newlands project.

Environmental Consequences - Both Alternatives

The proposed action and the no action alternatives would not affect ITAs, since there are no trust assets at either project site.

3.2.11 Environmental Justice

Lewis Wasteway and A-C3 Panicker Drop Hydroelectric Unit Affected Environment

Executive Order No. 12898, Environmental Justice, requires each federal agency to achieve environmental justice as part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects, including social and economic effects, of its programs, policies, and activities on minority and low-income populations. EPA guidelines for evaluating potential adverse environmental effects of projects require identification of minority populations when a minority population either exceeds 50 percent of the population of the affected area or represents a meaningfully greater increment of the affected population than of the population of some other appropriate geographic unit.

Analysis reveals that the ethnic composition of the populations of Churchill County is less than 50 percent and is different from the State of Nevada. Analysis of the percentage of persons below the poverty level for Churchill County reveals that the incidence of poverty in the County is not meaningfully different from the State of Nevada. Statistics for ethnicity and income for Churchill County and the state of Nevada are shown in Table 3 (<http://quickfacts.census.gov/qfd/states/32/32001.html>).

Additionally, none of the proposed project elements is located in populated areas.

Description	Churchill County	Nevada
White	75.2 %	52.9 %
Black	2.1%	8.9%
Native Americans	5.0 %	1.6 %
Asian	3.0 %	7.9 %
Pacific Islanders	0.3 %	0.7 %
Hispanic or Latino	12.8 %	27.3 %
Per-Capita Income (2010)	\$25,134	\$27,003
Median Household Income (2010)	\$54,538	\$54,083
Persons Below Poverty (percent, 2010)	13.1%	14.2%

Table 1 Ethnicity and Income statistics for Churchill County (2013 U.S. Census)

Environmental Consequences - Both Alternatives

Neither the proposed action nor the no action alternative would disproportionately affect minority or low-income populations.

3.2.12 Soils

The project would require soil disturbances at both the Lewis Wasteway and the A-C3 Panicker Drop locations.

Lewis Wasteway Hydroelectric Unit Affected Environment

The soils of the embankment between the V-Line Canal and Lewis Wasteway are compacted earth fill that was installed after the failure of Lewis Wasteway. The compacted fill has a pea gravel filter at the toe of the levee on the north side of the Lewis Wasteway. The embankment has been effective in stabilizing the V-Line Canal Bank and minimizing leakage into the Lewis Wasteway drainage. The embankment continues to be compacted by vehicle traffic. The compaction and erosive elements (e.g. wind and rain) have resulted in the roadway at the crest of the levee (Bottom Road) becoming concave to the west of the Lewis Wasteway. The slope has resulted in a high spot that causes some vehicles to

become high centered, see Figure 10. The crest of the levee is paved with approximately 6 inches of gravel. A geotechnical evaluation would be conducted at each site.

A-C3 Panicker Drop Hydroelectric Unit Affected Environment

Downstream of the A-C3, the canal is constructed of native soils with some riprap lining approximately 3ft up on each side of the canal and 30 feet downstream of the check structure, see Figure 6.

Lewis Wasteway Hydroelectric Unit Environmental Consequences

The construction of the new Lewis Wasteway would be conducted in phases. After the irrigation season, water from the V-Line Canal, upstream of V-C2, would need to be pumped down and the water will be immediately returned back into the V-Line Canal, downstream of V-C2. Construction would commence with the excavation of the Lewis Wasteway embankment and construction of the temporary road across the V-Line Canal. During the temporary road construction across the V-Line Canal, the property owner located west of the project would temporarily access their property through an adjacent property owner's property. After the excavation is complete and the temporary road is built, the new inlet, pipelines, gates, hydroelectric plant and stilling basin would be installed. After the installation and inspection of the hydroelectric facilities are complete, the replacement embankment would be installed and compacted per the design documents. The fill material would meet specifications and be from commercial sources.

The construction of the new Lewis Wasteway inlet would require the excavation of approximately 7700 square feet of the designed compacted earthen embankment for the foundation of the head works, installation of the 60-inch epoxy coated carbon steel hydroelectric turbine pipeline and the two 48-inch precast concrete bypass pipelines. The excavated material would be used to make a temporary road across the V-Line Canal to allow access west of the construction site. After the head works are constructed and the pipelines are placed and properly bedded, the embankment would be reconstructed to design specifications which include a sand filter chimney in the core and full length of the embankment.... In the location of the embankment, tell tail drains will be installed, and a soil mix will be deposited and compacted to build up the embankment to prevent seepage. The crest of the embankment, which is also Bottom Road, would be reconstructed and paved with gravel. Riprap would be reinstalled in the V-Line Canal to complete the new Lewis Wasteway installation.

Approximately 900 square feet of vegetation would be removed from the bottom of Lewis Wasteway, mostly crabgrass and weeds, see Figure 7. The organic material would be properly disposed of in an approved landfill. Native soil would be removed from the same location to make room for the foundation of the hydroelectric unit and the stilling basin. The removed native soil would be used to fill in the eroded section of Lewis Wasteway (southwest corner) that was not replaced after the 2008 failure event of the Wasteway head structure. Riprap would be placed downstream of the stilling basin and around the hydroelectric unit to prevent erosion.

During construction, all fugitive dust would be controlled using BMPs. Since the disturbance would be relatively small, watering would be the method used for dust control. Care would be taken to avoid runoff when watering down construction areas and weed-free straw wattles would be utilized where necessary. Once the construction is complete, the temporary road across the V-Line Canal would be removed and Bottom Road would return to its normal function.

A-C3 Panicker Drop Hydroelectric Unit Environmental Consequence

Installation of the hydroelectric unit would require the excavation of the foundation of the unit and the stilling basin. Approximately 900 square feet of native soil would be impacted by the work. The native soil removed would be used to rehabilitate the worn banks downstream of the A-C3.

Work downstream of the A-C3 would require some excavation and reshaping of the canal cross-section. BMPs would be used to control all fugitive dust. The primary method for controlling the dust on the project would be watering from a water truck. Additionally, BMPs will include but are not limited to placement of straw wattles and sediment barriers.

The project would not change the appearance of the surrounding area, other than to improve the canal banks. The only noticeable change would be the improvement of the canal cross-section, the hydroelectric unit and stilling basin with its associated riprap.

No Action

In the absence of the proposed project, the soils would remain as they are currently.

3.2.13 Floodplains

Lewis Wasteway Hydroelectric Unit Affected Environment

Federal Emergency Management Agency (FEMA) flood insurance rate map 32001C1070F, dated 9/26/2008, shows that the area where construction would take place at the V-C2 is located outside the probable flood zone designated Unshaded-X.

A-C3 Panicker Drop Hydroelectric Unit Affected Environment

FEMA flood insurance rate map 32001C1750F, dated 9/26/2008, shows that the area where construction would take place at the A-C3 is located outside the probable flood zone designated Unshaded-X.

Lewis Wasteway Hydroelectric Unit Environmental Consequences

The project would not be constructed in the floodway as confirmed by the County floodplain manager. The hydroelectric unit would be constructed at an elevation of 3992 feet. The project would not be constructed in any special flood hazard areas.

A-C3 Panicker Drop Hydroelectric Unit Environmental Consequences

The project would not be constructed in the floodway as confirmed by the County floodplain manager. The hydroelectric unit would be constructed at an elevation of 3960 feet. The project would not be constructed in any special flood hazard areas.

No Action

In absence of the proposed project, all of the facilities would remain as they are currently.

3.2.14 Historic and Cultural Resources Lewis Wasteway and A-C3 Panicker Drop Hydroelectric Unit Affected Environment

“Cultural Resources” is a broad term that includes prehistoric, historic, architectural, and traditional cultural properties. Those cultural resources that are included in or eligible for inclusion in, the National Register of Historic Places (NRHP) are referred to as historic properties. The criteria for NRHP eligibility are outlined at 36 CFR Part 60.4. Section 106 of the National Historic Preservation Act (NHPA) requires federal agencies to take into account the effects of their undertakings on historic properties. Compliance with Section 106 of the NHPA follows a series of steps outlined at 36 CFR Part 800. These steps are used to identify and consult with interested parties, determine the area of potential effects (APE) for an undertaking, determine if historic properties are present within the APE, assess the effects the undertaking would have on historic properties, and resolve any adverse effects to historic properties before the undertaking is implemented. The Section 106 process also requires consultation with the Nevada State Historic Preservation Office (SHPO), Indian tribes, and other interested parties.

Mesa Field Services of Sparks, Nevada, and their subcontractors conducted a class III cultural resources inventory consisting of a pre-field records search and pedestrian survey of Lewis Wasteway and A-C3 Panicker Drop and its associated power line path. The surveys were conducted in February - March 2014. The purpose of this inventory was to identify cultural resources in the 2 acre discontinuous APE and to evaluate the eligibility of those resources for inclusion in the NRHP.

Reclamation considers the Newlands Project to be an historic property including all associated contributing features. Reclamation considers the A-Line Canal (including the A-C3 Panicker Drop) and the V-Line Canal (including the V-C2 and Lewis Wasteway features) to be a contributing components of the Newlands Project, eligible for inclusion in the NRHP Register under Criterion A, for their association under the themes of reclamation, irrigation, and the development of agriculture in the State of Nevada. The period of significance of the Newlands Project and its conveyance features begins in 1903 with the start of construction of the Truckee Canal and ends in 1942 with the termination of the Civilian Conservation Corps CCC program.

Reclamation applied the criteria of adverse effect and Secretary of the Interior Standards to the historic properties. The criteria for adverse effect are located at 36 CFR § 800.5(a)(1). The section states: “An adverse effect is found when an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the National Register in a manner that would diminish the integrity of the property’s location, design, setting, materials, workmanship, feeling, or association. Consideration shall be given to all qualifying characteristics of a historic property, including those that may have been identified subsequent to the original evaluation of the property’s eligibility for the National Register. Adverse effects may include reasonably foreseeable effects caused by the undertaking that may occur later in time, be farther removed in distance or be cumulative.”

In summary, based on all of the available information, Reclamation finds the overall project would result in a finding of no adverse effect to historic properties pursuant to 36 CFR §800.5(b). Concurrence from the Nevada SHPO regarding this finding is pending. Reclamation would complete section 106 prior to any project related ground disturbance and submit a finding of effect with the appropriate documentation to the Nevada SHPO, seeking concurrence on the findings. Reclamation would not make a decision on this project, and sign the Finding of No Significant Impact (FONSI), until consultation with the Nevada SHPO has been concluded.

Any applicable mitigation measures resulting from consultation would be included in the Draft EA to avoid, minimize, or mitigate effects to known and unknown historic properties would be implemented

through a Memorandum of Agreement (MOA) with the appropriate consulting parties. In the event of an unanticipated discovery of unknown cultural resources during construction activities, Reclamation would be immediately notified and any ground disturbing activities within 50 feet of the discovery would be stopped until the find can be inspected by a qualified archaeologist and avoidance or recovery measures can be developed in consultation with Reclamation, as outlined at 36 CFR § 800.13. Work would not resume at that specific location until authorized by Reclamation.

Lewis Wasteway and A-C3 Panicker Drop Hydroelectric Unit Environmental Consequences

Proposed Action

Reclamation is in the process of completing Section 106 compliance, with consultation with the Nevada SHPO pending, related to the Proposed Action for the TCID Lewis Wasteway Replacement and Low Head Hydroelectric Project. Reclamation finds the overall project would result in a finding of no adverse effect to historic properties pursuant to 36 CFR §800.5(b). Concurrence from the Nevada SHPO regarding this finding is pending. Reclamation would complete section 106 prior to any project related ground disturbance and submit a finding of effect with the appropriate documentation to the Nevada SHPO, seeking concurrence on the findings.

No Action

Under the No Action alternative, Reclamation would not allow the proposed project. Conditions related to cultural resources would remain the same as existing conditions. There would be no impacts to cultural resources under the No Action alternative.

3.3 Irreversible and Irretrievable Commitment of Resources

A commitment of resources is irreversible when its primary or secondary impacts limit the future option for a resource. An irretrievable commitment refers to the use or consumption of resources that is neither renewable nor recoverable for later use by future generations. The commitment of resources refers primarily to the use of nonrenewable resources such as fossil fuels, water, labor, and electricity.

3.3.1 Lewis Wasteway

According to the definition, replacing the Lewis Wasteway and the installation of a hydroelectric unit at the Wasteway is not an irreversible or irretrievable commitment of resources. The hydroelectric unit would not consume water; it would instead use the water related resources of flow and pressure head to generate electricity. The water resource would be available for its current use as well as for future generations. The installation of the hydroelectric unit is reversible; it can be removed and the Lewis Wasteway can then function as it had in the past (original design) or the new head gates on the Lewis Wasteway can remain closed and the V-Line Canal can continue to function as it currently does without sending flow to the Carson River.

3.3.2 A-C3 Panicker Drop

According to the definition, the installation of a hydroelectric unit at the A-C3 Panicker Drop is not an irreversible or irretrievable commitment of resources. The unit would not consume water; it would instead use the water related resources of flow and pressure head to generate electricity. The water resource would be available for its current use as well as for future generations. The installation of the hydroelectric unit is reversible; it can be removed and the A-C3 Panicker Drop can then function as it currently does.

3.4 Cumulative Impacts

A cumulative impact is an impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non- Federal) or person undertakes such other actions (40 CFR ~ 1508.7). Based on review of planning documents and information acquired during the scoping phase of this Project, there are no known developments or actions planned within the region of influence.

Do to the absence of reasonably foreseeable future actions, the cumulative impacts analysis consists of the incremental impact of the proposed Project on past and present actions. Cumulative impacts to cultural and archaeological resources could occur if unanticipated discoveries were made during construction activities, however, based on the detailed Class III cultural inventory, cultural resource impacts are anticipated to be negligible. Cumulative visual impacts are related to the introduction of new facilities into the landscape, ground disturbance, and sensitive viewers but are expected to be minor.

Based on the relatively small amount of ground disturbance, facility improvements, temporary construction activity period, and the use of BMPs, cumulative impacts to soil resources, water resources, wildlife, and air quality are expected to be negligible.

3.4.1 Lewis Wasteway

According to the definition, the replacement of the Lewis Wasteway and the installation of a hydroelectric unit at the Wasteway would have a current impact in that it is an addition to the existing structure and has the potential to add noise at the location of the installation. To function properly the hydroelectric unit is dependent upon the flow and pressure head that currently exists at that specific location. No additional modifications relating to the installation are planned or foreseen for that location or others. There are no known foreseeable future actions at this location.

3.4.2 A-C3 Panicker Drop

According to the definition, the installation of a hydroelectric unit at the Panicker Drop would have a current impact in that it is an addition to the existing structure and has the potential to add noise at the location of the installation. To function properly the hydroelectric unit is dependent upon the flow and pressure head that currently exists at that specific location. No additional modifications relating to the installation are planned or foreseen for that location or others.

There are no known foreseeable future actions at this location.

4.0 CONSULTATION AND COORDINATION

4.1 Consulation and Coordination

The Draft EA was provided for a 25-day public review and comment period on May 30, 2014, at [US Bureau of Reclamation, Mid-Pacific Region website](#), at the Churchill County Library, and at the Bureau of Reclamation, Lahontan Basin Area Office which is located in Carson City, Nevada. A news release was issued and notice of availability was sent to those on the mailing list.

4.2 Tribal Consultation

Tribal consultation was initiated by letter on May 30, 2014 to the Fallon Paiute Shoshone Tribe and the Pyramid Lake Paiute Tribe for comment.

4.3 Agency Consultation

4.3.1 National Historic Preservation Act

As stated above in Section 3.2.14, Section 106 of the NHPA requires Federal agencies to consider the effects of Federal undertakings on historic properties (properties determined eligible for inclusion in the National Register). Compliance with Section 106 of the NHPA is a process done in consultation with the Nevada SHPO, Fallon Paiute Shoshone Indian Tribe, and other interested parties.

Reclamation will enter into consultation with the Nevada SHPO as outlined in the 36 CFR Part 800 regulations describing the Section 106 process. Pursuant to the regulations at 36 CFR §800.59(c), the Nevada SHPO has a minimum of 30 days from receipt to review an agency finding.

4.3.2 Endangered Species Act (1973) Section 7 Consultation

Section 7 of the ESA of 1973, as amended, prohibits Federal agencies from authorizing, funding, or carrying out activities that are likely to jeopardize the continued existence of a listed species or destroy or adversely modify its critical habitat. By coordinating with the USFWS before initiating projects, agencies review their actions to determine if these could adversely affect listed species or their habitat. If a May Affect determination is made, then either informal or formal consultation is initiated with the USFWS. Through consultation, the USFWS works with other Federal agencies to help design their programs and projects to conserve listed and proposed species. However, if a no effect determination is made, no consultation with the USFWS is required.

On May 2, 2014, Reclamation staff researched the USFWS on-line Information, Planning, and Conservation System to determine the presence of Threatened or Endangered Species within the proposed project area. According to the USFWS there are no listed species under the Endangered Species Act of 1973 (Act), as amended, in Churchill County, Nevada (U.S. Fish and Wildlife Service, 2014) that would be impacted by the proposed action or are known to occur within the project area. Since they are not present, there would be no effect.

4.3.3 Related Laws, Rules, and Regulations

TCID will obtain all necessary permits from local county, state, and federal agencies. This includes compliance with all legal requirements such as the Endangered Species Act, Fish and Wildlife Coordination Act, Migratory Bird Treaty Act, National Historic Preservation Act, and Air Quality Standards.

4.4 Agencies and Individuals Contacted

Agency	Individual
Nevada Department of Wildlife	Tim Herrick
U.S. Fish and Wildlife Service	Ted Koch, State Supervisor
U.S. Fish and Wildlife Service	Robert Williams, Field Supervisor
U.S. Environmental Protection Agency	Environmental Review Office
Nevada Bureau of Water Pollution Control	Joseph Maez
Nevada Bureau of Safe Drinking Water	Jim Balderson
Nevada Bureau of Air Quality Planning	Adele Malone, Planning Supervisor
Nevada State Historic Preservation Office	Rebecca Palmer, Historic Preservation Specialist
Nevada Division of Water Resources	Kelvin Hickenbottom, Deputy State Engineer
Nevada State Clearinghouse	Skip Canfield
Churchill County Floodplain Manager	Michael Johnson
U.S. Army Corps of Engineers	Kristine Hansen, Senior Project Manager
Natural Resources Conservation Service	Lex Riggle, Fallon Service Center
Nevada Natural Heritage Program	Eric Miskow, Biologist/Data Manager
Fallon Paiute-Shoshone Tribes (4,5)	Mervin Wright
Truckee Carson Irrigation District (TCID)	Rusty Jardine
Churchill County	Eleanor Lockwood
Adjacent Landowner	Mike and Terry Yohey
Adjacent Landowner	Hazel O'Neal

4.5 List of Preparers

Bureau of Reclamation

Julia A. Long
U.S. Bureau of Reclamation
Natural Resources Specialist
Lahontan Basin Area Office
705 North Plaza St. Suite 320
Carson City, NV 89701
Ph: 775-884-8372
Fax: 775-882-7592

Farr West Engineering

Danny Sommers
5442 Longley Lane Suite A
Reno, Nevada 89441
Ph: 775-853-7265
Fax: 775-284-3408

Mesa Field Services

Sean Simpson, M.A., RPA
150 Isidor Ct., Ste 101
Sparks, NV 89441
Ph: 775-424-3970

5.0 REFERENCES

Jardine, Rusty, 2014 Personal communication, Truckee Carson Irrigation District, District Manager.

Nevada Natural Heritage Program 2004. State of Nevada Department of Conservation and Natural Resources. Rare Species List. Website: [Nevada Natural Heritage Program 2004. State of Nevada Department of Conservation and Natural Resources. Rare Species List](#). Accessed March 2014

U.S. Fish and Wildlife Service. 2014. Nevada's Endangered, Threatened, Proposed and Candidate Species by County. Nevada Fish and Wildlife Office list updated August 5, 2013.

Temple University Department of Civil/Environmental Engineering (www.temple.edu/departments/CETP/envir010.html), and Federal Agency Review of Selected Airport Noise Analysis Issues, Federal Interagency Committee on Noise (August 1992).

(U.S. Department of Transportation, Federal Highway Administration, fhwa.dot.gov/environment/noise/noise_barriers/design_construction/keepdown.cfm).

United States Census Bureau. Website: [United States Census Office](#). Accessed March 2014