3.19 Public Safety and Health

3.19.1 Affected Environment

3.19.1.1 Overview

The public safety and health section addresses project activities that may pose health and safety risks to users of public and private lands in the immediate vicinity of project facilities. Based on this definition, the EIS study area includes the main line pipeline system and ancillary facility ROWs, and facilities within the proposed groundwater development areas that include groundwater drilling pad sites, access roads, gathering pipelines, and electrical distribution lines (**Figure 3.0-1**). Also included are the transportation routes required for delivery of hazardous materials (e.g. equipment fuel and delivery of water treatment chemicals).

This section describes the following:

- Hazardous materials and waste:
  - The regulatory definitions for transporting and storing hazardous materials required for construction and for disposal of construction solid waste; identification of the types of project hazardous materials.
  - The potential for encountering existing sources of human-caused soil and water contamination during construction.
- Noise:
  - The definition of noise; the background noise environment in the areas where pipeline and ancillary facilities would be constructed; and where long term noise-generating equipment (pump stations) would operate. The nearest noise sensitive locations (residences, schools, churches, special management areas) to these noise generation sources are identified.
- Pipeline design and construction:
  - The design and construction standards for water pipelines to ensure safe operation.
  - Pipeline operational safety and potential consequences of pipeline water releases.

Other health and safety hazards and risks are discussed in the following sections:

- Project-related dust generation and combustion emissions are discussed in Section 3.1, Air and Atmospheric Values.
- Risks of damage to pipeline and ancillary facilities from earthquakes and fault movement are discussed in Section 3.2, Geologic Resources.
- Project noise effects to wildlife are discussed in Section 3.6, Terrestrial Wildlife.

3.19.1.2 Right-of-way and Ancillary Facilities

Hazardous Materials and Waste

"Hazardous materials," which are defined in various ways under a number of regulatory programs, and "hazardous waste" can represent potential risks to both human health and the environment when not managed properly. Hazardous materials and hazardous wastes are further defined in **Appendix F3.19**.

The following major databases were reviewed to identify potential sites of hazardous material releases or solid waste activities located near the proposed project areas: Comprehensive Environmental Response, Compensation and Liability Act (CERCLA); National Priorities List, Enforcement and Compliance History Outline; Envirofacts Data Warehouse (USEPA 2009a); and NDEP Project Tracking Database. Descriptions of these databases are provided in **Appendix F3.19**.The following lists provide information regarding management requirements during transportation, storage, and use of particular hazardous chemicals, substances, or materials:

- The Superfund Amendments and Reauthorization Act Title III List of Lists or the Consolidated List of Chemicals Subject to Emergency Planning and Community Right-to-know Act and Section 112(r) of the CAA (USEPA 2006a).
- The USDOT listing of hazardous materials in 49 CFR 172.101.

Pursuant to regulations promulgated under CERCLA, as amended by Superfund Amendments and Reauthorization Act, release of a reportable quantity of a hazardous substance to the environment must be reported within 24 hours to the National Response Center (40 CFR Part 302). NAC 445A.347 also requires immediate reporting of a release of a reportable quantity of a hazardous substance to the Nevada Division of Emergency Management. In addition, under the State of Nevada Water Pollution Control Permit program, all releases of a reportable quantity must be reported as soon as possible, but not later than 24 hours after the event, to the NDEP Bureau of Corrective Actions.

Hazardous materials that are not entirely used or applied may become hazardous waste. Solid waste consists of a broad range of materials that include garbage, refuse, wastewater treatment plant sludge, non-hazardous industrial waste, and other materials (solid, liquid, or contained gaseous substances) (USEPA 2006b). In Nevada, solid waste disposal is regulated under NAC 444.570-444.7499; disposal of hazardous waste is regulated under NAC 444.850-444.8746. Nevada regulates the storage and handling of certain defined "highly hazardous substances" under NAC 459.952-459.9542.

Fuels and lubricants would be the primary hazardous materials of concern, in terms of volumes stored and used during construction. Other minor amounts of hazardous materials or substances also may be present during construction, and would be subject to the reporting, handling, and hazard communication requirements in the various regulatory programs described above.

The types of solid waste generated during the construction phase include wood, concrete, metal, petroleum products, and chemical waste such as sealants and adhesives.

During operation of the project most of the hazardous materials would be used at the pumping stations and the water treatment facility. Materials at pump stations would include diesel fuel for back-up generators, biocides, and water treatment chemicals to be determined (SNWA 2011). The water treatment facility would also consume water treatment chemicals including chlorine compounds, corrosion inhibitors, and other chemicals to treat specific water quality characteristics that will not be determined until specific water sources are tested. Mineral oil would be used for transformers, switches, circuit breakers, capacitors, and other electrical equipment at new or upgraded electrical substations. Hazardous materials used for well maintenance would be brought to and removed from the site by maintenance personnel and not stored on-site for extended periods.

Operation and maintenance would generate solid waste similar in composition to that of construction activities, but in much smaller quantities. Operation and maintenance are not expected to generate hazardous waste on a regular basis. Hazardous waste generation would be occasional and in small amounts.

Noise

Noise is generally considered to be unwanted sound (Federal Transit Administration 2006). Sound is what is heard when ears are exposed to small pressure fluctuations in the air. Sound generated by the vibration of objects moves through the air in waves. Noise can be described in terms of three variables: amplitude (loud or soft); frequency (pitch); and time pattern (variability).

- Amplitude. Sound pressure or energy is the magnitude of the sound heard by the ear. This magnitude ranges from low energy (soft) to higher energy (loud). Loudness is expressed in decibels (dB).
- Frequency. Sound is a fluctuation of air pressure. The number of times the fluctuation occurs in one second is called its frequency. Frequency is quantified in cycles per second, or Hertz. Human hearing sensitivity generally ranges between 20 and 20,000 Hertz. Human hearing does not respond equally to all sound frequencies. Therefore, a portion of the sound frequency range (A-weighted) is used to define what humans can normally hear.
- Time pattern. Noise is usually generated by a variety of distant background sources, both natural and human. The amplitude and frequency of these noise sources vary constantly, but may fall within a narrow range, particularly in rural areas where there are few human noise generation sources. Periodic short-term increases in background noise can occur from nearby noisy sources, such as vehicular traffic.

Generally, outdoor noise levels within the project study area are low due to the rural nature of the area. Noise can be generated from wind, animals, humans, transportation, and construction activities. Noise levels may vary markedly within the project area, with noise levels as low as 30 – 40 dBA (decibels A-weighted scale) in wilderness areas to 85 – 90 dBA in urban areas and along major highways.

A guideline standard of a day-night level of 55 dBA was established as a threshold by the USEPA (1974) to protect residential areas from activity interference and annoyance. This standard has been widely used to regulate noise levels for stationary industrial sources, but can vary by state. For mobile sources and short-term construction, the NDOT follows the Federal Highway Administration's noise standard as outlined in the 23 CFR 772 "Procedures for Abatement of Highway Traffic Noise and Construction Noise".

Noise would be generated by excavation and grading equipment during the construction of the pipeline system and ancillary facilities, and during pumping station operation. As stated in Section 3.8, Land Use, the proposed pipeline ROWs and ancillary facilities would be located almost entirely on BLM lands. Aerial photos and other sources were examined to determine the locations of nearby residences, or other public gathering locations (e.g. schools, churches, scenic viewpoints) near (up to 2 miles) from project ROW and pumping station facilities.

The proposed pipeline, power lines, and pump stations would be located near the following locations or communities (**Figure 3.19-1**):

1. Coyote Springs residential development (vicinity of the intersection of U.S. Highway 93 and Nevada State Highway 168 in Clark and Lincoln counties). This development is in its early stages, with no existing residential structures within 1 mile of the proposed ROWs, based on 2008 aerial photography. Pipeline and transmission line ROWs are sited approximately 200 to 300 feet west of the development boundary, parallel to U.S. Highway 93. Highway 93 lies between the proposed project ROWs on the west and the Coyote Springs development boundary on the east. The private land block that includes the Coyote Springs development extends for 9 miles adjacent to Highway 93.
2. Ranch structures at Big Springs (approximately 15 miles south of Garrison, Utah). Ranch buildings and corrals are located near the head of Big Springs, approximately 500 feet east of the proposed Snake Valley lateral pipeline and power line ROWs.
3. Garrison, Utah. This unincorporated community adjacent to Utah Highway 21 includes residences, a church, and other commercial buildings. The nearest Garrison residence is located 1.5 miles east of the pipeline and power line ROW and 1.75 miles from the Snake Valley North Pump Station.

Figure 3.19-1 Noise Sensitive Areas

4. Baker, Nevada. This unincorporated community adjacent to Nevada Highway 486 and 487 includes residences, an elementary school, and commercial buildings. The nearest Baker residence to the terminus of the Snake Valley pipeline and power line is estimated to be 1.5 miles.

Other potentially noise sensitive areas include federal special management areas.

- The nearest GBNP boundary is located 3.5 miles from the Snake Valley North Pump Station.
- The nearest BLM special management area (Snake Indian Burial Cave) is located 1.6 miles north of the Snake Valley South Pump Station.

Pipeline Safety and Reliability

According to the American Society of Civil Engineers (ASCE), approximately 6 billion gallons of treated water (equivalent to 14 percent of the total U.S. daily water production) is lost nationally due to leaks within water transmission systems. These losses are attributed to the fact that much of the 800,000 miles of water pipelines are constructed with rubber gasket joints. Failure of water transmission mains, however, is a rare occurrence, with an anticipated service life of 65 to 95 years (ASCE 2009). New water transmission pipelines are designed, constructed, and operated to the best industry standards to maximize their efficiency and reliability over their service life.

Design and construction guidelines and standards for water pipelines are published by the American Water Works Association and endorsed by the American National Standards Institute. Additional design guidance is available from ASCE, the National Association of Corrosion Engineers, and to a lesser extent, the Water Environment Federation. Compliance with these standards and guidelines is voluntary, though they may be adopted by regulating agencies. These industry practices are intended to define the level of quality materials that are appropriately used for most water systems, and if followed, will result in a system that is properly designed, tested, and constructed. Design and construction guidelines and standards for water transmission pipelines within the SNWA system are governed by the much more rigorous Facilities Engineering Guides – Volume 3 Pipeline Design. Additional design standards which may be applicable to well-field collection pipes are detailed in the Las Vegas Valley Water District's Uniform Design and Construction Standards: http://www.lvvwd.com/assets/pdf/ eng_udacs_2010.pdf. Those standards were prepared to be in compliance with the State of Nevada's Public Water System Design, Construction, Operation, and Maintenance Regulations (NRS 445A.800 - 445A.955).

3.19.1.3 Groundwater Development Areas

Hazardous Materials and Waste

The results of the database review indicated that there are no known listed sites in the proposed groundwater development areas and pipeline and power line ROWs (NDEP 2009a,b; USEPA 2009b,c).

Regional Ground Water Quality and Contamination

A baseline water quality assessment of the carbonate aquifer in Nevada and Utah was conducted in 2003 by the USGS (Schaefer et al. 2005). Wells completed in the carbonate aquifer were tested for general water quality, isotopes, organic compounds, pesticides, radon, and microbiology. Of 30 wells that were sampled, 7 are located in proposed project basins. Sampling results include the following:

- Inorganic constituents above maximum contaminant levels are probably related to natural conditions in the aquifer rocks and presence of geothermal conditions rather than inputs from human contamination sources.
- Pesticides and pesticide degradation compounds were encountered in agricultural pesticide use areas.
- The detection of VOCs was attributed to contamination of sampling equipment. No analyses were conducted for petroleum hydrocarbons.
- In many of the wells that were sampled, identified aquifer contaminants may not have spread widely because of very slow groundwater flow rates.

Noise

Baseline noise levels within groundwater development areas are comparable to those described for the ROW areas. The community of Baker is located within a portion of a groundwater development area in northern Snake Valley.

Pipeline Safety and System Reliability

Pipeline design and safety standards for gathering pipelines within groundwater development areas are the same as those described for the mainline pipeline.

3.19.2 Environmental Consequences

3.19.2.1 Rights-of-Way

Issues

The issues and concerns regarding potential impacts of the proposed pipeline and ancillary facility construction and maintenance to public safety and health are listed below:

- Potential effects of hazardous material spills on soils, water, and biological resources.
- Pipeline and ancillary facility construction and operation noise effects on nearby residences and communities.
- Pipeline damage or failure resulting in water loss, resulting in potential risks to public safety, and potential adverse impacts to environmental resources.

Assumptions

- Construction activities include the surface-disturbing activities needed to construct the pipelines, pump stations, meter stations, production well locations, valves, pressure reducing stations, and permanent access roads so that the entire system can be placed into service. It also would include reclamation activities for areas where the surface has been disturbed.
- Operational activities include ROW stabilization measures such as reseeding and repair of erosion control structures. Pumping station noise generation is discussed in this section. Potential water conveyance issues associated with pipeline and pumping station operations are discussed. Evaluation of pipeline water releases are based on the available descriptions of how the SNWA would monitor pressure changes in its pipeline systems to detect leaks and larger accidental releases and the SNWA scenario for a maximum case release.

Methodology for Analysis

The following lists the steps in the analysis of impacts to public safety and health:

- Review the hazardous material and waste handling procedures as described in the Applicant Environmental Protection Measures (**Appendix E**) for conformance to materials management regulations to determine if such procedures would be protective of the environment and public health.
- Evaluate the existing BLM RMP management actions and best management practices and SNWA ACMs (**Appendix E**) to limit the extent and duration of predicted impacts.
- Recommend additional mitigation measures if warranted, to avoid, reduce, or offset impacts.
- Evaluate the effectiveness of the proposed mitigation measures.
- Estimate residual impacts after BLM management actions and BMPs, ACMs, and recommended mitigation measures are applied.
- A qualitative evaluation was completed for the potential environmental effects of a maximum pipeline water release scenario because the pipeline system has been not been fully designed. The maximum release scenario was evaluated in a project location with the greatest elevation change below the release point.

3.19.2.2 Proposed Action, Alternatives A through C

Hazardous Materials and Wastes

The largest quantities of hazardous materials to be used are hydrocarbon fuels (diesel and gasoline) and lubrication oil. It is not possible to predict potential quantities of these materials that would be transported or stored to pipeline segments and construction sites. However, by necessity, much of the fuel and lubricants would be transported directly to work sites on public roads in relatively small tankers (e.g., 3,000 gallons or less for fuel). The ACMs (**Appendix E**) would provide procedures for handling and disposal of hazardous materials and wastes during construction activities (ACM A.1.55). Impacts of hazardous material spills would be direct, but short-term with prompt removal or

remediation of impacted media. Compliance with applicable government regulations and ACMs would substantially reduce spill incidence and the risk of impacts of spills on the environment and public. Adverse events, though uncommon, do occur. With adequate protection measures and swift action to prevent a large loss of material, the risk of long-term effects is reduced. All spills of any size on public lands would be reported to the BLM for implementing response operations.

Ground disturbance during construction activities has the potential for the unintentional discovery of contaminated media, particularly soil. Review of Federal and NDEP databases indicated no known contaminated sites in ROW areas. Therefore, there is low potential for encountering contaminated soil. The project passes through a rural industrial area near the project terminus northeast of Las Vegas. Because of this historic use and because of the potential for unauthorized dumping of hazardous materials, it is recommended that the SNWA conduct soil contaminant surveys within proposed ROWS prior to construction (ROW-PS-1). If contamination is encountered, it would be cleaned up according to applicable rules and regulations.

ROW-PS-1: Hazardous Material Surveys. SNWA would conduct BLM-approved hazardous materials-contaminant surveys before establishing final pipeline ROW locations. Effectiveness: This measure would be effective, minimizing potential impacts from hazardous materials. Pre-construction surveys for hazardous materials would minimize unanticipated disturbance of these areas.

Common hazardous materials used in operations would largely consist of fuels and lubricants, but used in lesser quantities than in construction. However, in contrast to construction, operations at the water storage facility at the pipeline terminus would require the use of water treatment chemicals including sodium chloride, sodium hypochlorite, corrosion inhibitors, and hydrofluorosilicic acid (SNWA 2011). The largest quantity of material would be sodium hypochlorite, with 64,000 gallons expected to be stored on-site at any given time. There also would be 3,200 gallons of zinc orthophosphate (corrosion inhibitor) and 11,200 gallons of hydrofluorosilicic acid available on-site. Other water treatment chemicals could be used depending on the quality of water eventually used and produced.

Sodium hypochlorite is used as a disinfectant for drinking water. It is not persistent in the environment and is broken down readily on exposure to air and water (Agency for Toxic Substances and Disease Registry 2002). It can have acute effects on people since it is very corrosive. Zinc orthophosphate, is lightly toxic, but may have little effect if discharged to the environment (The Cadmus Group 2004). Hydrofluorosilicic acid is a fluoridation agent which is considered a severe irritant for short term human exposure and is toxic to some aquatic animals, but is not persistent in the environment as it is readily neutralized in air and water (CSBP 2008). The level of treatment for arsenic in raw water is not currently known. If arsenic treatment is needed, it would likely involve addition of ferric chloride and sodium hypochlorite. Any sludge generated from arsenic treatment would be deposited in an approved landfill.

Solid waste would consist of trash, empty containers, used oil, and other materials that are designated to be discarded. The ACMs (**Appendix E**) provide procedures for handling and disposal of hazardous materials and solid and hazardous wastes during facility operations, as identified in ACMs A.2.2 and A.2.3.

As with construction activities, impacts of spills would be direct, but short-term with prompt removal or remediation of impacted media. Compliance with applicable government regulations and ACMs would substantially reduce spill incidence and the risk of impacts of spills on the environment and public. Adverse events, though uncommon, do occur. With adequate protection measures and swift action to prevent a large loss of material, the risk of long-term effects is reduced.

Noise

Noise would be generated by construction equipment. The SNWA has committed to maintain standard noise control devices (e.g., mufflers) to reduce construction equipment noise (ACM A.9.1), and to reduce unnecessary engine noise (ACM A.9.3). Noise levels decrease exponentially with distance and therefore, impacts would be limited to areas in proximity to construction. A general estimate of pipeline construction noise ranges from approximately 70 dBA within 500 feet of the construction ROW, diminishing to less than 50 dBA at one mile (California Department of Transportation and USFS 1987). Increased noise from construction equipment would be short-term, intermittently occurring at a given location and lasting only as long as the construction period, potentially 60 to 90 days. Pumping

station noise would be relatively continuous to maintain water flow within the mainline pipeline.It is anticipated the construction equipment would generate noise at levels exceeding 55 DbA at the following noise sensitive locations:

1. The property boundary of the Coyote Springs Development in Clark and Lincoln Counties. Construction noise would be combined with existing traffic noise on Highway 93, which may range from 70 to 80 DbA. It is anticipated that the additive noise levels would increase slightly (2 to 3 dB), and would be more continuous during working hours.
2. The ranch property located at Big Springs in the Snake Valley. This location is rural, and therefore, short-term construction noise levels would increase substantially above current background levels. SNWA has committed to notify the ranch owner in advance of construction and to conduct construction activities during daylight hours to the extent possible (ACM A.9.4).

The SNWA would enclose its pumping stations and utilize design features to minimize operational noise levels (ACM A.9.2). After incorporating these design features, it is anticipated that operational noise levels would not exceed 70 dBA at 500 feet. This level translates to a noise level of less than 50 dBA at one mile from the source (Minnesota Pollution Control Agency 1999).

Pipeline Safety and System Reliability

The only potential for pipeline water releases during construction would occur during hydrostatic testing, when the pipeline would be filled with water and pressure-tested in short sections to ensure the integrity of the pipe during future operations. Water releases from this construction step are expected to be small in volume because of the small fraction of the pipeline length filled at the time of testing and the opportunity to control the rate of release with relief valves. ACM 1.62 states that hydrostatic test water be discharged to dry washes. Erosion control measures would be implemented, and the discharges would be managed and monitored so that they do not exceed the typical 2 to 5 year flood events in these existing washes.

The mainline pipeline system would begin operations as well fields are developed and gathering pipelines are constructed. The system would be operated and monitored as described in Chapter 2, Section 2.5.1.8, Operation and Maintenance. When the potential for a leak or larger release is detected, the system would be shut down to isolate the pipe section where the leak or release is suspected. It is expected that this monitoring and response system will be adequate to detect and control nearly all water releases from the pipelines or ancillary facilities. To insure that SNWA is implementing the best practices to reduce the risk of releases, it is recommended that the SNWA conduct periodic technical reviews of its system (ROW-PS-2).

Proposed Mitigation Measure:

ROW-PS-2: **Five-year Review of Leak Detection Methodologies**. SNWA would review and implement best industry practices for leak detection. Effectiveness: This measure would be effective in reducing pipeline leaks, ruptures, and interruptions in service because it would require the SNWA to evaluate best industry practices regularly and adopt those which are appropriate. Leak detection systems for water pipelines represent a spectrum of evolving technologies. Effect on other resources: There would be no effects of implementing this measure on other environmental resources.

There is low public risk from a sudden pipeline rupture during operations. The potential scenarios that might cause a sudden rupture include:

- Third party (contractor) damage. Pipeline damage can occur when contractors excavate without complying with “One-Call” rules (811).
- Operational error. Transmission pipelines have failed upon sudden closure of valves, without concurrent shutdown of pumps. Notwithstanding the controls that will be designed, installed, and implemented in accordance with the SNWA’s Facilities Engineering Guides, human override of controls is always a possibility.
- Earthquakes and fault movement. Faulting, and the attendant risks, are discussed in Section 3.2, Geologic Resources, under Geological Hazards.

- Floods and erosion. The SNWA's Facilities Engineering Guides address the depth of cover necessary to protect the transmission mains against scour. Even if exposed, the joints in SNWA's transmission mains will be fully welded, allowing the pipeline to remain intact. Flood hazard risks are discussed in Section 3.3, Water Resources.
- Terrorist acts, vandalism. Attempts to damage the pipeline system would most likely be directed toward aboveground facilities, which include pumping stations, pressure reducing stations, and the storage reservoir. Access to project aboveground facilities would be controlled by fencing and other surveillance measures. The security needs for the system will depend on the level of threat estimated, which will vary over time.
- The SNWA POD (2011) outlines a maximum water release scenario of 24.6 million gallons from a 10-mile pipeline segment (**Appendix E**). The effects of this scenario would depend upon the water release point. Two possible consequence outcomes are discussed below:
  - Basin side-slope release. This type of release would result in water flowing from a higher elevation on sloping terrain to the next lower basin floor. The greatest elevation difference (approximately 800 vertical feet) from one basin to another is from the Delamar Valley down slope to the Pahranagat and Coyote Springs valleys in Lincoln County. The SNWA pressure reduction facility is proposed at the bottom of this slope in the Coyote Spring Valley to account for this large elevation change. It is likely that released water would flow into the nearest dry wash that would then convey the water stream down the wash channel. Flows of this maximum volume would likely scour and widen the wash channel and convey larger rocks and coarse sediment. Sediment and rocks would likely be deposited on the alluvial fans of the next lower hydrologic basin where slope angles decrease. Finer sediments and gravel would be conveyed out onto the basin floor where the water would spread out and infiltrate into the basin floor. It is possible that water would accumulate in impermeable soil areas (playas) at low points in the basin and would remain until it evaporates. It is likely that perennial vegetation would be removed by scour in dry washes. It is possible that roads and highways that intercept the dry wash would be washed out and require repair. It is not expected that existing residences would be affected by this type of side slope scenario, since no residences are located downslope of drainages traversed by the largest diameter main line pipeline (Spring, Lake, Dry Lake, Delamar, Coyote Springs, and Garnet valleys).
  - Basin floor release. This type of release would likely result in water flowing onto the adjacent basin floor, either via dry washes or sheet flow across low gradient slopes. This type of release would likely cause limited erosion of large rocks and coarse sediment because the elevation change between the release point and the deposition area would be low (likely 50 to 100 vertical feet). It is likely that vegetation would be removed and also covered by deposited sediment. Depending on downgradient conditions, released water would spread out and infiltrate into the basin soil surface or pond in impermeable areas (e.g. playas). The Coyote Spring residential development is located in proximity (within 500 feet) of the large diameter main line pipeline segments in the Coyote Springs Valley. Water from a major release could flow into this residential area (presently unoccupied, but potentially built out in the future). Implementation of water industry design standards and the SNWA Facility Engineering Guidelines would reduce the likelihood of a pipeline failure and large water release. Leak detection systems (based on detecting changes in pipeline pressure) would be implemented during operations. The BLM recommends that the SNWA implement periodic technical reviews of its leak detection system to further reduce the likelihood of water releases (ROW-PS-2).

Conclusion. Fuels and lubricants would be the most common hazardous materials used in construction activities over a pipeline distance of approximately 306 miles. Impacts from spills during construction and operation of ROW facilities would be direct, but short-term, given prompt containment and cleanup of spilled materials. Protective measures proposed by SNWA and the existing regulatory framework greatly reduce the risks of spilled material and associated potential for contamination of soil, water, and biological resources. Hazardous and solid wastes would be handled and disposed off-site according to applicable regulations and applicant protective measures. Although the potential for encountering contaminated media during construction is low, the possibility exists.

It is anticipated that project construction noise would exceed 55 dBA at 2 noise sensitive locations (Coyote Springs Development and ranch at Big Springs) over the short term (60 to 90 days). Implementation of mufflers (ACM A.9.1) would reduce but not eliminate equipment noise.

Compliance with SNWA's Facilities Engineering Guides as indicated above would ensure that SNWA's pipeline is designed, constructed, and operated in accordance with current best practices within the water pipeline industry.

The accidental release of a large pipeline water represents an unlikely event. Nearly the entire pipeline length is located a mile or more from rural residences. The most likely outcome of a large water release event would be erosion in receiving drainages, and water ponding on basin floors. Implementation of leak detection systems, and block valve actuation would limit the size and extent of water releases.

- While highly unlikely, a large accidental water release (up to 24.6 million gallons) could cause dry wash scour and vegetation removal, deposition of rocks and sediment on valley side slopes, and sediment deposition and water ponding on valley floors. It is possible that a large water release could wash out roads and highways; portions of the Coyote Springs residential development (no current residences) located in Coyote Spring Valley could be flooded.

Residual impacts include:

- Compliance with BLM, other federal and state regulations that govern hazardous material cleanup would insure that contaminants in affected soils and water sources would be remediated to agency approved levels.
- No residual noise impacts from construction activities are anticipated.
- Continuous operational noise at the North Snake Valley pump station would be less than 50 A-weighted decibels at 500 feet, a level that is not expected to create activity interference and annoyance in Garrison, Utah. Garrison is located approximately 1.5 miles from the pump station.

3.19.2.3 Alternative D

Conclusion. The management requirements for hazardous materials and solid waste for Alternative D would be the same as for Alternatives A through C. The length of the Alternative D mainline ROW is shorter, 225 miles compared to 306 miles for Alternatives A through C. It is assumed that the risk of hazardous material spills and the amounts of hazardous and solid waste produced would be relatively proportional to the length of the ROW. Therefore, the number of hazardous material spills and waste generated would be about 26 percent less than for Alternatives A through C.

It is anticipated that project construction noise would exceed 55 DbA at one noise sensitive location (Coyote Springs Development) over the short term (60 to 90 days). Implementation of mufflers (ACM A.9.1) would reduce but not eliminate equipment noise.

The risks and magnitude of water releases during hydrostatic testing would be the same as those described for Alternatives A through C.

Residual impacts include:

- Compliance with BLM, other federal and state regulations that govern hazardous material cleanup would insure that contaminants in affected soils and water sources would be remediated to agency approved levels.
- No residual noise impacts from construction activities are anticipated.

3.19.2.4 Alternatives E and F

Conclusion. The management requirements for hazardous materials and solid waste for Alternative E and F would be the same as for Alternatives A through C. The length of the Alternative E mainline ROW is shorter, 263 miles compared to 306 miles for Alternatives A through C. It is assumed that the risk of hazardous material spills and the amounts of hazardous and solid waste produced would be relatively proportional to the length of the ROW. Therefore, the number of hazardous material spills and waste generated would be about 14 percent less than for Alternatives A through C.

It is anticipated that project construction noise would exceed 55 DbA at one noise sensitive location (Coyote Springs Development) over the short term (60 to 90 days). Implementation of mufflers (ACM A.9.1) would reduce but not eliminate equipment noise.

The risks and magnitude of water releases during hydrostatic testing would be the same as those described for Alternatives A through C.

Residual impacts include:

- Compliance with BLM, other federal and state regulations that govern hazardous material cleanup would insure that contaminants in affected soils and water sources would be remediated to agency approved levels.
- No residual noise impacts from construction activities are anticipated.

3.19.2.5 Alignment Options 1 through 4

There would be no important differences in potential impacts to public safety with respect to hazardous materials and solid waste management, pipeline design and construction, and construction noise when comparing Alignment Options 1 through 4 to equivalent segments of the Proposed Action.

3.19.2.6 No Action

Under the No Action Alternative, the proposed project would not be constructed or operated. No project-related surface disturbance or operation activities would occur. Risks to public safety and health would continue in relation to transport and use of hazardous materials for existing activities within the project area.

3.19.2.7 Alternatives Comparison

Table 3.19-1 summarizes the differences in impacts between the Proposed Action and Alternatives A though E.

Table 3.19-1 Summary of Potential Impacts to Public Safety Associated with Right-of-way Development

Potential Impact	Proposed Action and Alternatives A through C	Alternative D	Alternatives E and F
Hazardous Material Spills and Waste	Limited number of hazardous waste spills and waste is properly disposed.	Assume 26% fewer hazardous waste spills and less hazardous waste generated based on shorter mainline pipeline length.	Assume 14% fewer hazardous waste spills and less hazardous waste generated based on shorter mainline pipeline length.
Unanticipated Hazardous Waste Sites	Number of sites limited due to rural project location and preconstruction surveys.	Same or less than Alternatives A through C based on shorter mainline pipeline length.	Same or less than Alternatives A through C based on shorter mainline pipeline length.
Noise	Construction noise impacts localized and limited in duration at two sensitive noise locations.	Construction noise impacts localized and limited in duration at one sensitive noise location.	Construction noise impacts localized and limited in duration at one sensitive noise location.
Pipeline Safety and System Reliability	Low likelihood of accidental water releases during operations over a pipeline distance of 306 miles. Extent of water releases would be limited by leak detection systems and block valves.	Low likelihood of accidental water releases during operations over a pipeline distance of 225 miles. Extent of water releases would be limited by leak detection systems and block valves.	Low likelihood of accidental water releases during operations over a pipeline distance of 263 miles. Extent of water releases would be limited by leak detection systems and block valves.

3.19.2.8 Groundwater Development and Groundwater Pumping

Issues

The issues and concerns regarding potential impacts of the groundwater development and pipeline water conveyance are the same as those described for the ROWs and ancillary facilities:

- Potential effects of hazardous material spills on soils, water, and biological resources.
- Handling and disposition of solid and hazardous waste.
- Potential effects of water treatment chemical spills on soils, water, and biological resources.
- Pipeline damage or failure resulting in water loss, resulting in potential risks to public safety, and potential adverse impacts to environmental resources.

Assumptions

- Construction activities include the surface-disturbing activities needed to construct the well pads and gathering pipelines. The same BMPs and ACMs discussed for the ROWs (Tier 1) would be applicable to subsequent phases because construction methods would be similar.
- Water quality treatment requirements at well locations cannot be defined until additional water development has occurred. The need for this information for future analysis is included in the list of incomplete and unavailable information in the Chapter 3.0 introduction.
- Evaluation of pipeline water releases are based on the available descriptions of how the SNWA would monitor pressure changes in its pipeline systems to detect leaks and larger accidental releases and the SNWA scenario for a maximum case release.

Methodology for Analysis

- The impact analysis steps for groundwater development in the well fields are the same as those described for the ROW and ancillary facilities (Tier 1).
- A qualitative evaluation was completed for the potential environmental effects of a pipeline water release scenario because the pipeline system has been not been fully designed.
- Mitigation measures discussed in this resource section focus on new measures. Where applicable, some of the ROW mitigation measures may apply to surface disturbance activities associated with groundwater development. These ROW mitigation measures also would be considered in subsequent NEPA tiers.

3.19.2.9 Proposed Action, Alternatives A through C

Hazardous Materials

The types of fuels and lubricants required for collector pipeline construction, and the methods for storage and spill cleanup would be the same as those described for the ROW and ancillary facilities. The types of solid waste, and approved disposal methods would also be the same.

Noise

Groundwater development would include the construction of groundwater development fields and infrastructure to interconnect the well fields to the primary water transmission pipelines. The community of Baker would be located within a groundwater development area in northern Snake Valley. It is recommended that the SNWA apply construction equipment noise reduction measures (ACMs 9.1 and 9.3), and that ACM 9.4 (owner notification and daylight working hours) be applied when construction work is undertaken within 500 feet of an occupied residence.

Safety and Reliability

Future groundwater development would require additional water pipelines. The design, construction, and operation of all future water pipeline and associated facilities would conform to the SNWA's Facilities Engineering Guidelines existing at the time of construction. This conformance would maximize the pipelines' efficiency and ensure reliability

over their service life. The mitigation measures identified for pipelines in the ROW area also would be applicable for all new pipelines of 10-inches or greater diameter.

Conclusion. Public safety concerns for groundwater ROW development would be similar to those described for the main line pipeline and ancillary facilities. The BLM-recommended mitigation measure for pre-construction hazardous material surveys, ROW-PS-1 (Hazardous Material Surveys), would be applicable. With the implementation of the ACMs, impacts from hazardous materials and waste would be short-term and localized.

Noise associated with construction activities would be short-term and localized to areas near the gathering pipeline ROWs and well pads. The vicinity of Baker is included in one of the Snake Valley groundwater development areas. Implementation of noise reduction (ACMs A9.1 and 9.2) and landowner notification and daylight working hours.

Additional water releases are anticipated from operation and maintenance of water wells. While there are numerous well sites (144 to 174 wells for the Proposed Action), releases from individual wells and collector pipelines are expected to be relatively small, posing little risk to public safety or the environment. To insure that the best methods for leak detection and control are used, it is recommended that periodic reviews of leak detection technology, ROW-PS-2 (Five-year Review of Leak Detection Methodology), be implemented.

Potential residual impacts include:

- Residual effects resulting from the use of hazardous materials would depend on the substance, quantity, timing, location, and response involved in the event of an accidental spill or release. In accordance with spill response plans, prompt cleanup of spills and releases would minimize the potential of residual effects due to an accidental spill or release of hazardous materials. Compliance with the BLM, other federal and state regulations that govern the transportation, storage, use, and disposal of hazardous materials and ACMs would greatly reduced the potential for residual effects due to hazardous materials.
- No residual noise impacts to noise sensitive areas are anticipated.
- With the implementation of the water industry and SNWA design measures, the collector water pipelines would be designed, constructed, and operated safely. No residual effects of pipeline water conveyance are expected unless a highly unlikely large water release incident occurred. The potential for a large water release would be less than the mainline because the collector pipeline diameters would be smaller.

3.19.2.10 Alternative D

Conclusion. Potential public safety concerns from groundwater development would be the same as those described for the Proposed Action and Alternatives A through C. The total amount of ROW associated with well fields and collector pipelines is expected to be smaller than the Proposed Action and Alternatives A through C and would be restricted to a smaller area in Lincoln County. The number of unanticipated hazardous waste sites encountered during construction would be equal to or less than the Proposed Action.

Similar to the Proposed Action and Alternatives A through C, noise levels during construction of well pads, access roads, and pipelines within the groundwater development would be localized and of short duration. Since no groundwater development would occur in Snake Valley, no construction noise effects to residences are expected.

Implementation of pipeline design standards and SNWA operational pipeline monitoring systems would reduce the likelihood of a large water release. The potential consequences of a large release are the same as those described for the Proposed Action and Alternatives A through C.

The total amount of ROW associated with well fields and collector pipelines associated with Alternative D is expected to be smaller than the Proposed Action and Alternatives A through C. While water releases from wells and collector pipelines are possible during the project's life, most are likely to be small, posing little risk to the environment or public safety.

Potential residual impacts include:

- Residual impacts would be the same as Alternative A through C except that the use of hazardous materials and risk of encountering existing contamination would be less because of fewer miles of pipeline. The potential for a large water release would be less than the mainline pipeline because the collector pipeline diameters would be smaller.

3.19.2.11 Alternatives E and F

Groundwater Development

Conclusion. Potential public safety concerns from groundwater development would be the same as those described for the Proposed Action and Alternatives A through C. The total amount of ROW associated with well fields and collector pipelines is expected to be smaller than the Proposed Action and Alternatives A through C because there would be no facilities in Snake Valley. The number of unanticipated hazardous waste sites encountered during construction would be equal to or less than the Proposed Action.

Similar to the Proposed Action and Alternatives A through C, noise levels during construction of well pads, access roads, and pipelines within the groundwater development would be localized and of short duration. Since no groundwater development would occur in Snake Valley, no construction noise effects to residences are expected.

Implementation of pipeline design standards and SNWA operational pipeline monitoring systems would reduce the likelihood of a large water release. The potential consequences of a large release are the same as those described for the Proposed Action and Alternatives A through C.

The total amount of ROW associated with well fields and collector pipelines associated with Alternatives E and F is expected to be smaller than the Proposed Action and Alternatives A through C. While water releases from wells and collector pipelines are possible during the project's life, most are likely to be small, posing little risk to the environment or public safety.

Potential residual impacts include:

- Residual impacts would be the same as Alternatives A through C except that the use of hazardous materials risk of encountering existing contamination would be less because of fewer miles of pipeline. The potential for a large water release would be less than the mainline pipeline because the collector pipeline diameters would be smaller.

3.19.2.12 No Action

Under the No Action Alternative, the proposed project would not be constructed or operated. No project-related surface disturbance or operation activities would occur. Risks to public safety and health would continue in relation to transport and use of hazardous materials for existing activities within the project area.

3.19.3 Cumulative Impacts

Because health and safety issues are site-specific to the SNWA pipeline and water development, none of the identified past, present, and reasonably foreseeable projects identified in Chapter 2 are anticipated to interact with this project to create expanded cumulative impacts. The public transportation system (highways, roads) would be utilized by SNWA for delivery of treatment chemicals at the water storage and treatment facility northeast of Las Vegas. The small volume of SNWA-related truck traffic (less than 10 deliveries per month to the site) did not warrant further analysis.

3.19.3.1 Impacts Common to All Alternatives

Climate Change Effects

Climate change already appears to be influencing both natural and managed ecosystems of the American Southwest (Breshears et al. 2005, Westerling et al. 2006, Seager et al. 2007) and models indicate the likelihood of the Southwest being a climate change "hotspot" in the coming decades (Diffenbaugh et al. 2008). Recent warming in the Southwest is among the most rapid in the nation, significantly more than the global average in some areas (USGCRP 2009). Projections suggest continued strong warming in the region, with significant increases in temperature (USGCRP 2009) and decreases in precipitation (Seager et al. 2007). A warmer atmosphere and an intensified water cycle are likely to mean not only a greater likelihood of drought for the Southwest, but also an increased risk of flooding (USGCRP 2009). Greater variability in patterns of precipitation can be anticipated in the future. In the coming century, mean global temperature could increase significantly, with an associated increase in both the frequency of extreme events (heat waves, droughts, storms) and the frequency and extent of wildfire (IPCC 2007; Westerling & Bryant 2008; Krawchuk et al. 2009). Under such conditions, future impacts could be substantial for some resources, impacting biodiversity, protected areas, and agricultural lands.

Climate Change Effects to Public Safety and Health

Climate change effects were not evaluated for this resource because potential effects to Public Safety and Health as a result of climate change cannot be directly quantified.