

Appendix C: Social and Economic Impact Study



ASTORIA STATION SOCIAL AND ECONOMIC IMPACT STUDY



Prepared by the First District Association of Local Governments

2017

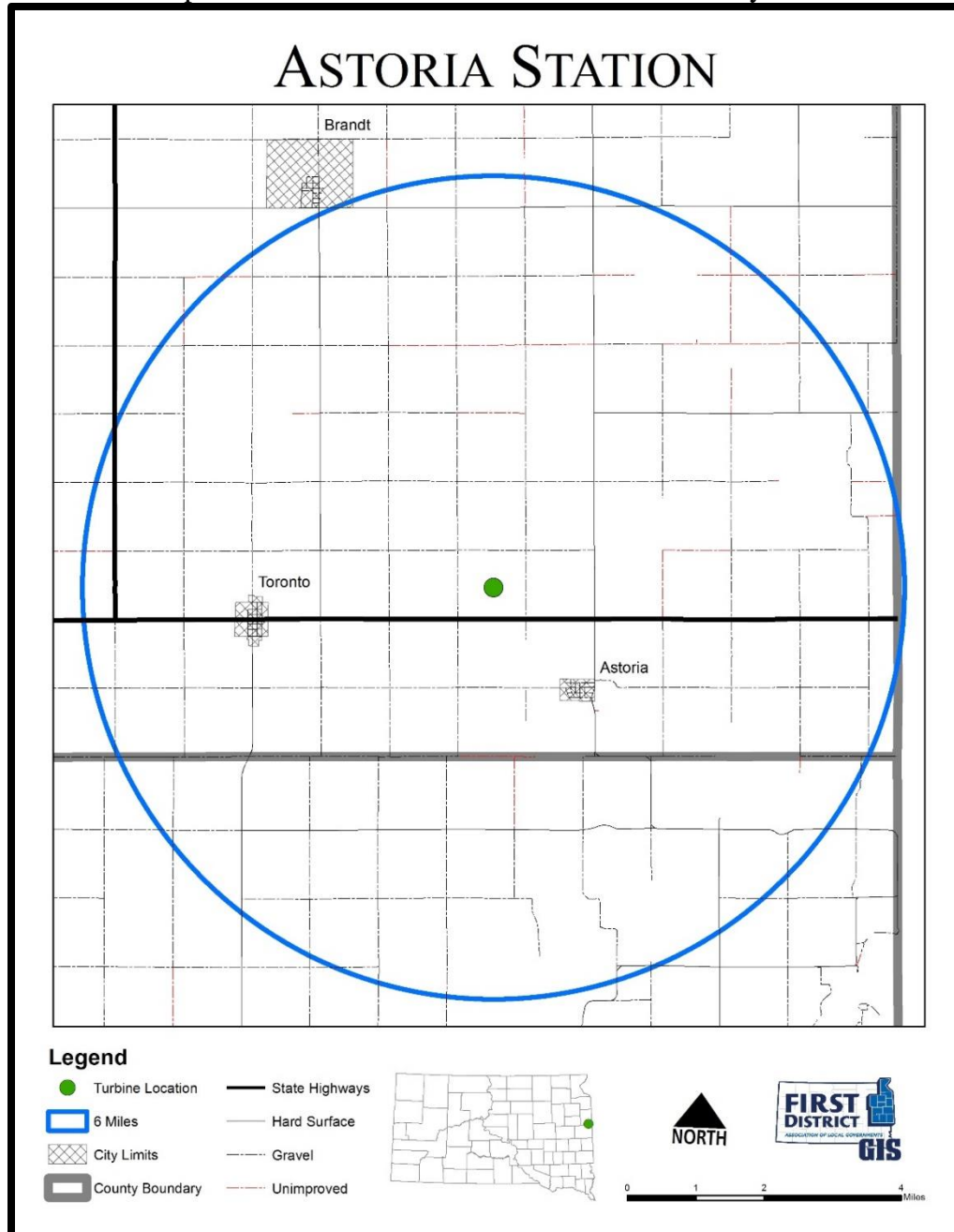
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Executive Summary

Otter Tail Power Company proposes to construct, own, and operate a simple-cycle combustion gas turbine consisting of one natural gas-powered combustion turbine generator (approximately 250 megawatts), one stack, standard operating enclosures, balance-of-plant equipment, and associated facilities. The site is located approximately 1.5 miles northwest of the Town of Astoria in the North ½ of Section 22 – Township 113 North – Range 48 West in Scandinavia Township, Deuel County, South Dakota. The following map shows the project location and the six-mile study area.

Map 1 – Astoria Station Location and 6-Mile Study Area



The purpose of this Social and Economic Impact Study is to aid the Local Review Committee in addressing the impact the proposed Astoria Station project will have in the twelve areas identified in South Dakota Codified Law 49-41B-7 within the six-mile study area as defined by the South Dakota Public Utilities Commission. While mitigation measures have been proposed in two of the twelve study areas the recommended mitigation measures will not create a significant impact within the study area. Recommended mitigation measures can be addressed by developing agreements with local governments or by securing required federal, state, and local permits prior to the start of construction.

Operational staffing is expected to consist of 3-5 new employees while construction staffing is expected to peak at 70 employees. Construction is expected to last approximately 13 months and start in the spring of 2020. Commercial operation is expected to begin in the spring of 2021.

The methodology for this study includes a description of existing conditions within a study area, assessing future conditions during project construction and operation and identifying any measures that may need to be implemented to mitigate negative impacts. Impacts are based upon construction activities and the number of additional workers that the study area will likely need to serve and whether the existing conditions can absorb the anticipated demand created by the project.

If the existing conditions can absorb the anticipated demand created by the project then a determination of ‘no significant impact’ is made and no mitigation measures are proposed. If the existing conditions cannot absorb the anticipated demand created by the project then a determination of ‘mitigation recommended’ is made and mitigation measures are proposed. Table 1 summarizes the determinations made for each study area.

Table 1 - Determinations

Study Area	Determination
1 – Housing Supplies	No Significant Impact
2 – Educational Facilities and Manpower	No Significant Impact
3 – Waste Supply and Distribution	No Significant Impact
4 – Wastewater Treatment and Collection	Mitigation Recommended – Wastewater Permits
5 – Solid Waste Disposal and Collection	No Significant Impact
6 – Law Enforcement	No Significant Impact
7 – Transportation	Mitigation Recommended – Haul Road Agreement and Transportation Permits
8 – Fire Protection	No Significant Impact
9 – Health	No Significant Impact
10 – Recreation	No Significant Impact
11 – Government	No Significant Impact
12 - Energy	No Significant Impact

Based upon the contents of this Social and Economic Impact Study it is the professional opinion of the First District Association of Local Governments that the construction and operation of the Astoria Station facility will have no significant impact on the social and economic environment within the South Dakota Public Utilities Commission defined six-mile study area after all haul road agreements, wastewater permits, and transportation permits are secured.

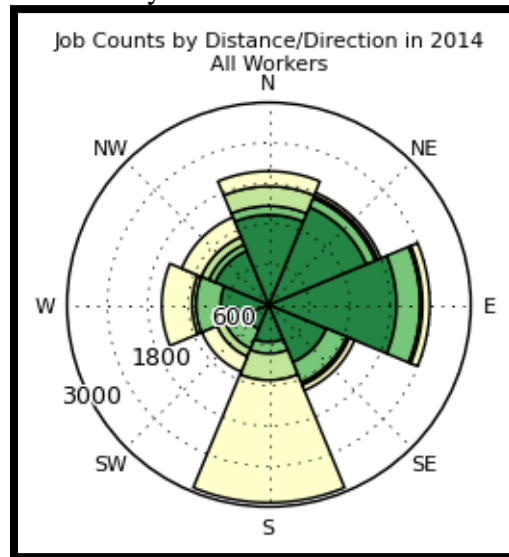
1 - Housing Supplies

While it is reasonable to assume that some Astoria Station employees and construction workers will seek housing within the six-mile study area, it is highly unlikely that all of the estimated 3-5 operational employees and 70 construction workers needed during peak construction will seek housing only within the six-mile study area. Therefore, a larger commuting area will be used to determine the impact on housing supplies for operational and construction workers. This analysis is based on 2014 Census data for Brookings County and Deuel County.

According to the 2014 US Census data, 7,592 of the 17,375 employees working in Brookings County commute to work from another county and 3,288 employees experience a commuting distance greater than 50 miles. In Deuel County 610 of the 1,394 employees working in Deuel County commute to work from another county and 543 employees experience a commuting distance greater than 50 miles. Based upon this information the Cities of Brookings (22,056 population – 2010 Census) and Watertown (21,482 population – 2010 Census) are within commuting distance of the project site.

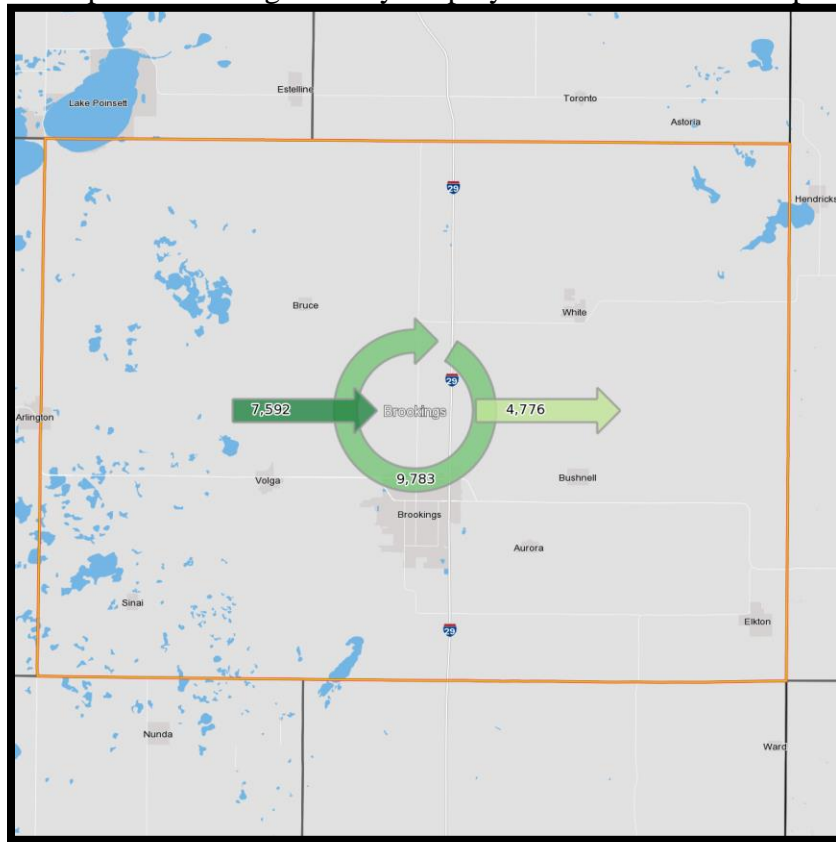
The following data analysis will identify where the Astoria Station workers are likely to seek housing, how many homes and rental units are available within the Astoria Station commuting area and if the existing stock of available homes and rental units can absorb the increased demand created by 70 workers required during peak construction and 3-5 permanent operational workers moving into the area.

Chart 1 – Job Counts by Distance/Direction – Brookings County



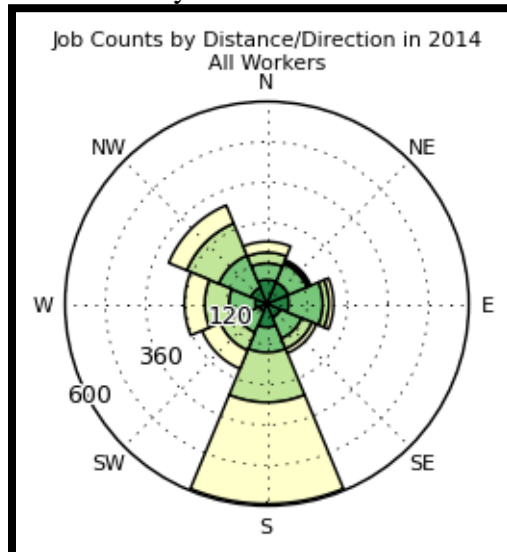
Source: <https://onthemap.ces.census.gov/>

Map 2 – Brookings County Employee Inflow/Outflow Map



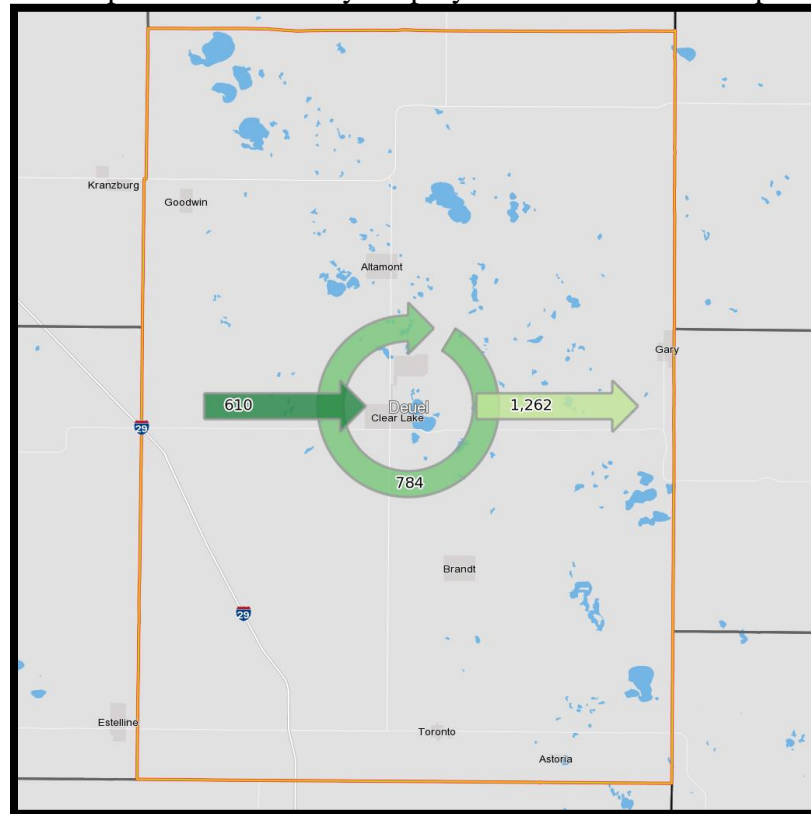
Source: <https://onthemap.ces.census.gov/>

Chart 2 – Job Counts by Distance/Direction – Deuel County



Source: <https://onthemap.ces.census.gov/>

Map 3 – Deuel County Employee Inflow/Outflow Map



Source: <https://onthemap.ces.census.gov/>

To address the housing supplies issue for construction and operational workers, housing supplies within the following geographies have been examined: Brookings County, Deuel County, Town of Astoria, Town of Brandt, Town of Toronto, City of Brookings and the City of Watertown. The following charts track owner-occupied and renter-occupied information within a 50-mile commuting area of the Astoria Station site.

Table 2 – Available Vacant Homes/Rental Units

Location	Vacant Homes	Rental Units
Town of Astoria	8	5
Town of Brandt	4	3
Town of Toronto	12	3
Brookings County	741	367
Deuel County	317	68
City of Brookings	263	293
City of Watertown	500	272
Totals	1,845	1,011

Source: https://factfinder.census.gov/faces/nav/jsf/pages/community_facts.xhtml#

The three municipalities within the six-mile study area (Astoria, Brandt and Toronto) have 35 vacant housing or rental units – half of the 70 Astoria Station construction workers. There are a total of 2,856 available housing and rental units within a 50-mile commuting radius from the

project site. Approximately 1,011 of the total units are rental units – a statistic that is vitally important because most of the construction workers will likely seek rental opportunities over home ownership due to the relatively short duration of this project.

There are approximately 1,845 available homes and 1,011 available rental units within the 50-mile commuting radius from the Astoria Station site. This existing supply of available homes and rental units is far more than sufficient to meet the demands of 70 temporary construction workers and 3-5 new operational workers.

Determination: No Significant Impact

2 – Educational Facilities and Manpower

There are two school districts within the study area:

- Deubrook 05-6
- Deuel 19-4

Deubrook School District

The current enrollment in the Deubrook School District is 346 students and their peak enrollment since 2010 was 365. 19 new students would need to be added to the district to reach previous peak enrollment numbers.

Table 3 – Deubrook 2015 Payable 2016 Taxable Valuations

Agricultural	\$287,238,988
Owner Occupied	\$68,178,376
Other Non-Ag/Utilities	\$35,517,763
Total	\$390,935,127

Source: SD Department of Education (Appendix A)

Table 4 – Deubrook 2015 Payable 2016 Levy per Thousand

Agricultural	\$1.782
Owner Occupied	\$4.631
Other Non-Ag/Utilities	\$9.918
Special Education	\$1.409
Capital Outlay	\$3.000
Bond Redemption	\$0.000
Pension Fund	\$0.300

Source: SD Department of Education (Appendix A)

According to Dr. Kimberly Kludt, Deubrook School District Superintendent, the Astoria Station would create no negative impacts on the Deubrook School District during construction or operational phases.

The Astoria Station will be constructed within the boundaries of the Deubrook School District and will have a positive impact on the taxable valuation of the school district.

Deuel School District

The current enrollment in the Deuel School District is 501 students and their peak enrollment since 2010 was 547. 46 new students would need to be added to the district to reach previous peak enrollment numbers.

Table 5 – Deuel 2015 Payable 2016 Taxable Valuations

Agricultural	\$365,267,331
Owner Occupied	\$97,763,940
Other Non-Ag/Utilities	\$62,396,384
Total	\$525,427,655

Source: SD Department of Education (Appendix B)

Table 6 – Deuel 2015 Payable 2016 Levy per Thousand

Agricultural	\$1.568
Owner Occupied	\$4.075
Other Non-Ag/Utilities	\$8.727
Special Education	\$1.409
Capital Outlay	\$2.500
Bond Redemption	\$0.000
Pension Fund	\$0.300

Source: SD Department of Education (Appendix B)

According to Chad Schiernbeck, Deuel School District Superintendent, the Astoria Station would create no negative impacts on the Deuel School District during construction or operational phases.

Total additional student capacity of the two school districts within the study area: 65.

According to the 2010 Census the average size of the United States household unit is approximately 2.58 members per household unit. The .58 represents the average number of children per household unit. Based upon the assumption that each member of the projected construction labor force peak of 70 new workers would fall within the parameter of .58 children per household unit, the projected maximum number of additional new students would peak at approximately 41 new students.

This figure is below the additional student capacity of 65 new students identified to reach peak enrollment of the school districts within the study area.

Determination: No Significant Impact

3 – Waste Supply and Distribution

Construction Waste

Waste generated during construction activities will be disposed of at a properly permitted waste site in accordance with the laws of South Dakota. Construction waste disposal will be the responsibility of the prime construction contractor responsible for construction of the Astoria Station project under the direction of Otter Tail Power Company.

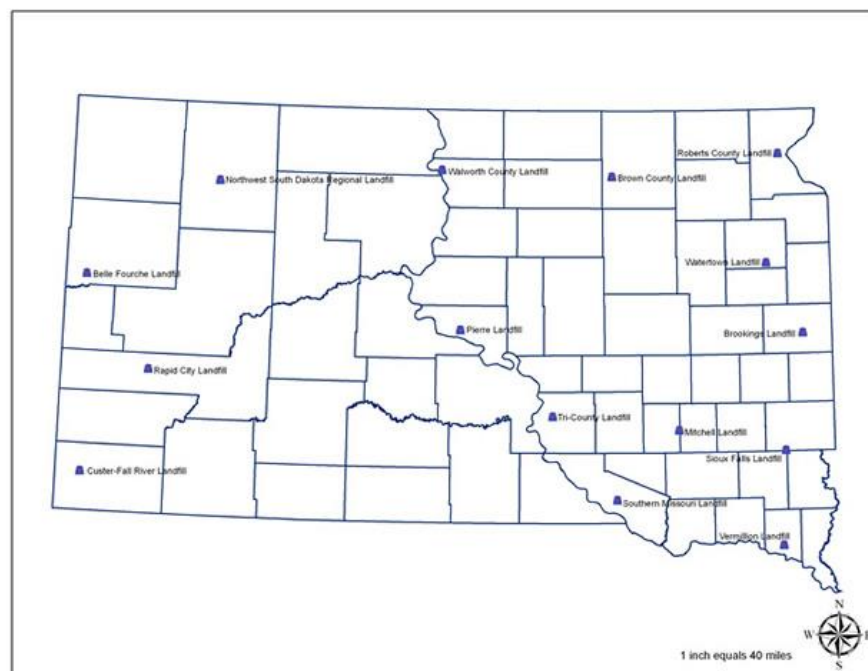
Operational Waste

Waste generated during operational activities will be disposed of at a properly permitted waste site in accordance with the laws of South Dakota. Operational waste disposal will be the responsibility of Otter Tail Power Company and will likely be handled by a private waste collection and disposal company.

Landfill Sites

While there are no properly permitted waste sites within the six-mile project area there are two municipal solid waste landfill sites located nearby. The Brookings Landfill and the Watertown Landfill are both within approximately 30 minutes of the Astoria Station site. The map on the following page shows the locations of municipal solid waste landfill permitted by the State of South Dakota.

Map 4 – Permitted Municipal Solid Waste Landfills in South Dakota



Source: <https://denr.sd.gov/des/wm/landfillmaps/lfstae.aspx>

<http://www.epa.gov/cleanenergy/energy-and-you/affect/sw-generation.html> - According to the U.S. Environmental Protection Agency:

Some electricity generation technologies result in the creation of solid waste. In some cases, this waste is disposed of in landfills. In other cases, this waste may contain toxic and hazardous elements and materials that require special handling, treatment, and disposal, as described below. Certain electricity generation technologies, however, produce no solid waste, or very insubstantial amounts. The specific solid waste impacts for each energy generation technology are described below.

Coal

The burning of coal creates solid waste, called ash, which is composed primarily of metal oxides and alkali. On average, the ash content of coal is 10 percent. Solid waste is also created at coal mines when coal is cleaned and at power plants when air pollutants are removed from the stack gas. Much of this waste is deposited in landfills and abandoned mines, although some amounts are now being recycled into useful products, such as cement and building materials.

Oil

Oil refining produces wastewater sludge and other solid waste that can contain high levels of metals and toxic compounds. Also, when oil is burned at power plants, residues that are not completely burned can accumulate, forming another source of solid waste that must be disposed.

Nuclear Energy

Every 18 to 24 months, nuclear power plants must shut down to remove and replace the "spent" uranium fuel. This spent fuel has released most of its energy as a result of the fission process and has become radioactive waste.

All the nuclear power plants in the United States together produce about 2,000 metric tons per year of radioactive waste. Currently, the radioactive waste is stored at the nuclear plants at which it is generated, either in steel-lined, concrete vaults filled with water or in above-ground steel or steel-reinforced concrete containers with steel inner canisters. In addition to the fuel waste, much of the equipment in the nuclear power plants becomes contaminated with radiation and will become radioactive waste after the plant is closed. These wastes will remain radioactive for many thousands of years.

Uranium processing produces radioactive wastes that must be adequately stored and isolated to minimize the risk of radioactive release. The management, packaging, transport, and disposal of this waste is strictly regulated and carefully controlled by the U.S. Nuclear Regulatory Commission and the U.S. Department of Transportation.

Municipal Solid Waste (MSW)

The burning of MSW in boilers creates a solid waste called ash, which can contain any of the elements that were originally present in the waste. MSW power plants reduce the need for landfill capacity because disposal of MSW ash requires less land area than does unprocessed MSW. However, because ash and other residues from MSW operations may contain toxic materials, the power plant wastes must be tested regularly to assure that the wastes are safely contained to prevent toxic substances from migrating into groundwater supplies. Under current regulations, MSW ash must be sampled and analyzed regularly to determine whether it is hazardous or not. Hazardous ash must be managed and disposed of as hazardous waste. Non-hazardous ash may be disposed of in a MSW landfill or recycled for use in roads, parking lots, or daily covering for sanitary landfills.

Natural Gas

The use of natural gas to create electricity does not produce substantial amounts of solid waste.

The above waste generation summaries from the U.S. Environmental Protection Agency and leads to the following conclusion: the natural gas-powered Astoria Station will not produce substantial amounts of solid waste as it operates to generate electricity.

Determination: No Significant Impact

4 – Wastewater treatment and collection

Astoria Station operational workers are anticipated to consume less than one gallon per minute of potable water during normal operations of the facility. The source of potable water at the site will originate from either an on-site groundwater well or Brookings-Deuel Rural Water. Both sources are anticipated to have sufficient water supply and distributional capacities to meet the projected potable water usage needs.

Operation of the Astoria Station facility is expected to consume water at a rate of 40 gallons per minute during periods of warm ambient temperatures. The source of process water at the site will originate from either an on-site groundwater well or Brookings-Deuel Rural Water. Brookings-Deuel Rural Water cannot currently supply the anticipated volume of water via pipeline without costly improvements to their distribution system. Therefore, it is anticipated that water from an on-site well supplied by ground water, or trucking of water off-site from Brookings-Deuel Rural Water, will be utilized to meet the operational needs of the project. If an on-site well is used, it is anticipated that water will be transferred into a 350,000-gallon water storage tank at a rate of up to 100 gallons per minute.

3-5 new operational workers are projected to work at the Astoria Station facility. The average family size in the US is 2.58 persons (2010 Census). If 5 new operational employees move in to the area with average sized families then 13 new inhabitants will increase water usage by approximately 39,542 gallons per month. This figure is calculated using the US Geological Survey

estimate of 100 gallons per person per day as an average for individual water usage (source: <https://water.usgs.gov/edu/qa-home-percapita.html>).

70 construction workers are projected to work at the Astoria Station facility during peak construction. The average family size in the US is 2.6 persons (2010 Census). If 70 construction workers move in to the area with average sized families then 182 new inhabitants will temporarily increase water usage by approximately 553,583 gallons per month. This figure is calculated using the US Geological Survey estimate of 100 gallons per person per day as an average for individual water usage (source: <https://water.usgs.gov/edu/qa-home-percapita.html>).

Increases in residential water usage will result in corresponding increases in wastewater volumes where workers live during construction and operation of the Astoria Station. The Cities of Brookings and Watertown are within commuting distance of the project site and an increase of 182 persons will increase their total populations by approximately 0.418%. This increase does not represent a significant population expansion that would adversely impact municipal wastewater collection and treatment systems at either location.

Wastewater generated by the operation of the Astoria Station facility from process and potable water is anticipated to be treated entirely on-site. Any off-site disposal of wastewater will be completed in accordance with state law. The following waste water treatment and collection permits for the Astoria Station may be issued by the South Dakota Department of Environment and Natural Resources:

1. NPDES/Surface Water Discharge
2. On-site Septic Systems
3. Storm Water Discharge

- **NPDES/Surface Water Discharge**

No process water is anticipated to be discharged. Presently the project plans to utilize ground water that will undergo treatment by a mobile demineralizer. By having the supplier perform off-site regeneration to remove the undesirable salts/minerals that occur naturally, this enables the project to operate in a zero-discharge mode for process water.

Should circumstances change such that the process water would be required to be disposed or discharged, the project would make arrangements for off-site disposal.

- **On-site Septic Systems**

There will be on-site wastewater septic system that incorporates a drain field. The water will originate from sinks, showers, toilets etc.-no process water will flow into this system.

- **Storm Water Discharge**

There will be a storm water pond to collect rainfall/snowmelt etc. from the areas that are paved or impacted by the facility. A Storm water discharge permit will be acquired prior to the construction of the pond. Should storm water accumulate into the pond the water will be sampled, analyzed, and discharged according to the parameters of the permit.

Determination: Mitigation Recommended – wastewater permits must be acquired from the South Dakota Department of Environment and Natural Resources before construction begins. The required permits can be found in the 1 Stop Environmental Permitting and Regulation Guide (2017 Edition) at: <https://denr.sd.gov/documents/envprmitguide.pdf> (Appendix C)

5 – Solid Waste Disposal and Collection

Construction Waste

Waste generated during construction activities will be disposed of at a properly permitted municipal solid waste landfill site in accordance with the laws of South Dakota. Construction waste disposal will be the responsibility of the prime construction contractor responsible for construction of the Astoria Station project under the direction of Otter Tail Power Company.

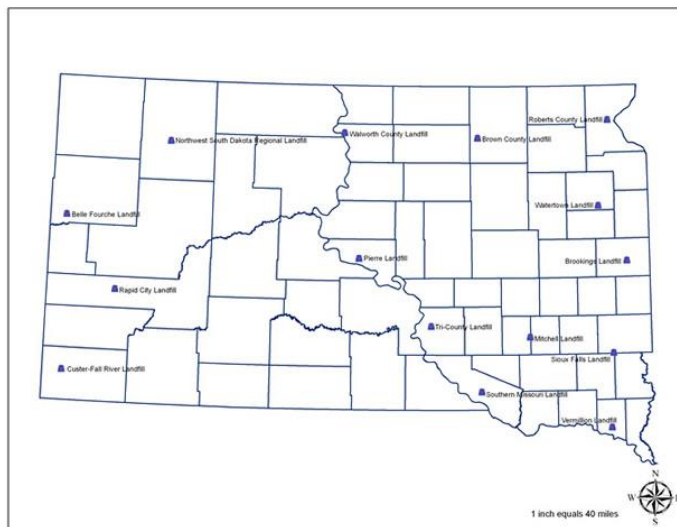
Operational Waste

Waste generated during operational activities will be disposed of at a properly permitted solid waste landfill site in accordance with the laws of South Dakota. Arrangements for operational waste collection and disposal will be the responsibility of Otter Tail Power Company and will likely be handled by a private waste collection and disposal company.

Landfill Sites

While there are no properly permitted waste sites within the six-mile project area there are two municipal solid waste landfill sites located nearby. The Brookings Landfill and the Watertown Landfill are both within approximately 30 minutes of the Astoria Station site. Map 3 shows the locations of municipal solid waste landfill permitted by the State of South Dakota.

Map 5 – Permitted Municipal Solid Waste Landfills in South Dakota



Source: [https://denr.sd.gov/des/wm/landfillmaps/lfstate.aspx](https://denr.sd.gov/des/wm/landfillmaps/lfststate.aspx)

Determination: No Significant Impact

6 – Law Enforcement

Two law enforcement agencies, the Brookings County Sheriff's Department and the Deuel County Sheriff's Department, are located within the six-mile project area. Both Sheriffs referenced in this study were in office during the construction of the Deer Creek Station, a natural gas fired power plant facility constructed in 2011 that is located approximately 13 miles south of the Astoria Station site, and were contacted to provide input as to the anticipated impact of the construction and operation of the Astoria Station facility.

Brookings County, South Dakota Sheriff's Department

Marty Stanwick, Sheriff.....605-696-8300

Full Time Officers – 13

Part Time Officers – 3

24-hour protection – yes

Dispatch location – City of Brookings

Capacity to handle existing caseload – yes

Any problems associated with Deer Creek Station – yes (speeding and reckless driving)

Any perceived impacts resulting from the Astoria Station project – none

Deuel County, South Dakota Sheriff's Department

David Solem, Sheriff605-874-8212

Full Time Officers – 4

Part Time Officers – 1

24-hour protection – yes

Dispatch location – City of Watertown

Capacity to handle existing caseload – yes

Any problems associated with Deer Creek Station – no

Any perceived impacts resulting from the Astoria Station project – none

Total Survey Number of Full- and Part-Time Law Enforcement Officers, by Agency

Brookings County Sheriff's Department	16
Deuel County Sheriff's Department	5

Total South Dakota County Full- and Part-Time Law Enforcement Officers in the Two Surveyed Law Enforcement Agencies	21
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The Brookings County Sheriff's Department has also cross-deputized the entire Brookings City Police Force. This provides access to 19 additional patrol officers should the need arise. The Sheriff's Department also oversees a Retired Senior Volunteer Patrol consisting of 22 volunteers that serve in a patrol and report role.

Brookings County Sheriff Marty Stanwick noted that his office received multiple traffic related complaints from within the Deer Creek Station project area relating to construction workers either speeding or driving recklessly on rural roads. Deuel County Sheriff David Solem did not recall receiving any complaints pertaining to the construction or operation of the Deer Creek Station facility. Neither Sheriff anticipated any negative impacts to be associated with the construction and operation of the Astoria Station project.

While neither law enforcement agency anticipated any adverse impacts resulting from the construction or operation of the Astoria Station facility both Sheriff David Solem of Deuel County and Sheriff Marty Stanwick of Brookings County agreed that effective communications between all parties impacted by the project would be the most effective means to avoid potential conflicts before they arise. Prior to the commencement of construction of the Deer Creek Station facility the owner, Basin Electric Power Cooperative, invited both law enforcement agencies to participate in a preconstruction meeting to familiarize them with the project and to facilitate communications between all parties. A similar meeting prior to the start of construction on the Astoria Station facility would be beneficial to all parties.

Determination: No Significant Impact

7 - Transportation

The primary mode of transportation used to bring shipments of construction equipment, workers and materials as well as operational workers into the Astoria Station site will be via state highway and township roads. Construction related traffic to the project site and operational traffic will travel to the site primarily on SD Highway 28 and gravel roads maintained by Scandinavia Township. A secondary traffic route impacts both Scandinavia Township and Deuel County roads. No roads maintained by Brookings County are likely to be impacted by the project.

SD Highway 28

Approximately 12 miles of SD Highway 28, from just west of the intersection of SD Highway 15 and SD Highway 28 to the border of South Dakota and Minnesota, falls within the study area.

Shipments trucked to the site are expected to travel over SD Highway 28 prior to entering the road network maintained by Scandinavia Township.

SD Highway 28 carries a six-inch thick bituminous surface that is 26 feet in width except for approximately one half of a mile of surface that is 54 feet in width located within the corporate boundaries of the Town of Toronto. Detailed surface information can be found on page 76 of the South Dakota Department of Transportation Surfacing Log (Appendix D)

There is one bridge, located at MRM 375.67 on SD Highway 28 within the study area.

Table 7 – Bridge Information

Structure Number	MRM	ADT	Fed Sufficiency Rating
20201280	375.67	478	79.9

Source: SDDOT State Owned Structures Report (Appendix E)

Data from two traffic count segments on SD Highway 28 provides average daily traffic information broken down by total traffic volume and total truck volume. One of the traffic count segments is from the SD Highway 15 and SD Highway 28 intersection east to the Town of Toronto and the other is located between the Town of Toronto and the South Dakota and Minnesota border. Traffic count information was taken from the 2016 South Dakota Traffic Flow Map (Appendix F).

- Average daily traffic between the intersection of SD Highway 15 and SD Highway 28 and the Town of Toronto
 - 1,013 – Total traffic volume
 - 158 – Total truck volume
- Average daily traffic from the Town of Toronto and the South Dakota and Minnesota border
 - 478 – Total traffic volume
 - 168 – Total truck volume

SD Highway 15

Approximately 2 miles of SD Highway 15, from the intersection of SD Highway 15 and SD Highway 28 then north two miles, falls within the study area. No construction shipments trucked to the site are anticipated to travel over SD Highway 15. Construction and operational workers may utilize SD Highway 15 to access the site.

SD Highway 15 carries a 6.8-inch thick bituminous surface that is 24 feet in width. Detailed surface information can be found on page 47 of the South Dakota Department of Transportation Surfacing Log (Appendix D). There are no bridges on SD Highway 15 within the study area (Appendix E).

Data from one traffic count segment on SD Highway 15 provides average daily traffic information broken down by total traffic volume and total truck volume. Traffic count information was taken from the 2016 South Dakota Traffic Flow Map (Appendix F).

- Average daily traffic from the intersection of SD Highway 15 and SD Highway 28 then north two miles
 - 1,257 – Total traffic volume
 - 221 – Total truck volume

Scandinavia Township Roads

Approximately two miles of Scandinavia Township roads will see an increased usage because of this project. There are no bridges on this section of Scandinavia Township roads.

Heavy haul roads will be utilized to haul construction materials to the project site and construction and operational worker commuting roads will be utilized by construction and operational workers as a means of travel to and from the project site.

- Construction Haul Roads
 - 482nd Avenue from SD Highway 28 north to Astoria Station – gravel with an existing 16-17-foot wide surface. A portion of 482nd Avenue would need to be widened to allow larger trucks to navigate the intersection. A portion of this section of 482nd Avenue may also need to be raised.
 - 193rd Street from County Road 311/483rd Avenue west to 482nd Avenue – gravel with an existing 17-18-foot wide surface. The west approach to 193rd Street and County Road 311/483rd Avenue intersection would need to be widened to receive larger trucks, as would the 193rd Street and 482nd Avenue intersection.
- Construction/Operational Worker Commuting Roads
 - 482nd Avenue from SD Highway 28 north to 193rd Street – gravel with an existing 16-17-foot wide surface
 - 193rd Street from County Road 311/483rd Avenue west to 482nd Avenue – gravel with a 17-18-foot wide surface

Deuel County Roads

Approximately one mile of the Deuel County road system may see the greatest increase usage because of this project. County Road 311/483rd Avenue from SD Highway 28 north to 193rd Street may be utilized as a secondary heavy haul road. Construction materials may be hauled to the project site on this route if 482nd Avenue is impassible. Operational and construction workers may use this route as a means of travel to and from the project site.

- Construction Haul Roads
 - County Road 311/483rd Avenue SD Highway 28 north to 193rd Street – asphalt with an existing 28-foot wide surface
- Construction/Operational Worker Commuting Roads

- County Road 311/483rd Avenue SD Highway 28 north to 193rd Street – asphalt with an existing 28-foot wide surface

There are no bridges on the above-mentioned Deuel County road.

Data from one traffic count segment on County Road 311/483rd Avenue provides average daily traffic volume. Traffic count information was recorded in 2013 and comes from the South Dakota Department of Transportation - Deuel County Traffic Flow Map (Appendix G).

- Average daily traffic on County Road 311/483rd Avenue approximately ¼ mile north of SD Highway 28.
 - 227 – Total traffic volume

South Dakota Department of Motor Carrier Services Permits

Single Trip Permits

Temporary Licensing - Single-trip commercial license, temporary fuel, or temporary PUC (single state registration) permits.

Oversize / Overweight - Allows for the movement on state highways of a vehicle transporting a non-divisible load that exceeds size, weight, or size and weight limitations.

Over 80K on the interstate - Single-trip permits which allows a motor vehicle to exceed 80,000 pounds when traveling on the Interstate Highways. The permit does not allow a motor vehicle to exceed its legal axle weight, legal tire weight, or the weight as allowed by the Bridge Gross Weight Formula.

Movement to scale site - Single-trip permit to allow a motor vehicle to move to the nearest available public or private scale to determine whether a load is properly placed on the motor vehicle. Before a single-trip permit is requested, the operator moving a load in question must obtain approval from the private scale operator to weigh the vehicle and its load. A motor vehicle operator issued a permit to move to a weigh scale may not leave the scale site unless his load conforms to all legal weight limits or he obtains an overweight permit.

Books of 10 - Self issue books of permits for over 80k on the interstate, single trip commercial licensing, telephonic coupons, and construction plate permits.

Extended Length Permits

Booster Axle - Allows the movement on State Trunk Highways of a cement truck equipped with an overweight booster axle (not a variable load or lift axle) before July 1, 1996 whose loaded weight exceeds that allowed by SDCL 32-22-21 but does not exceed 600 pounds per inch of tire width.

Non-divisible Loads - Allows for the movement of a non-divisible oversize but not overweight load being hauled on a single unit or combination of two units up to a width of 14 feet 6 inches.

Side overhang may not exceed 3 feet 3 inches. Total combined front and rear overhang may not exceed 30 feet. Total length of a single unit is limited to 60 feet, including load overhang. Total length for a two-unit combination is limited to 85 feet, including load overhang, and the second unit's wheelbase may not exceed 43 feet. The vehicle operator must keep a trip log. Trip authorization is required if the load exceeds a width of 12 feet.

Lift Axle/ Variable Load Axle - Allows a motor vehicle to be overweight when making a turn due to the lifting of a lift axle or variable load axle in order to make the turn. This permit allows the raising of the lift axle 100 feet before beginning a turn provided the axle is lowered within 100 feet after completing the turn. Not available for trailers.

Oversize Trailer - Allows for the movement of a semi-trailer manufactured for moving oversize equipment up to 10 feet wide and up to 110 feet long, but not over height or overweight. Can be assigned to a trailer or the power unit.

Overlength Semi-trailer - Allows for the movement of a semitrailer manufactured before July 1, 1998 over 53 feet long but not longer than 60 feet. The overall length of the tractor and semitrailer may not exceed 80 feet.

Slow on Interstate - This permit is valid only when no parallel route is available. Allows the movement of a vehicle that cannot maintain a speed of 40 miles per hour on Interstate Highways. The vehicle must display flashing warning lights and must be driven as far to the right as possible.

Scandinavia Township Haul Road Agreements

Scandinavia Township requires the execution of a haul road agreement between the Township and the contractor prior to the beginning of construction. The haul road agreement identifies haul roads, the condition of haul roads prior to construction and sets forth the responsibilities of the contractor to make road-related improvements or to restore roadbeds and appurtenances to the condition they were in prior to the start of construction.

The Astoria Station facility will not be the first construction project within the study area to require a haul road agreement with Scandinavia Township. Scandinavia Township has developed previous haul road agreements for the Buffalo Ridge II wind farm and the CapX2020 power line

Deuel County Road Agreements

Deuel County requires the execution of a haul road agreement between the County and the contractor prior to the beginning of construction. The haul road agreement identifies haul roads, the condition of haul roads prior to construction and sets forth the responsibilities of the contractor to make road-related improvements or to restore roadbeds and appurtenances to the condition they were in prior to the start of construction.

The Astoria Station facility will not be the first construction project within the study area to require a haul road agreement with Deuel County. Deuel County has developed previous haul road agreements for the Buffalo Ridge II wind farm and the CapX2020 power line

Construction Traffic

The impact of construction traffic will be addressed in permits issued by the State of South Dakota and by Haul Road Agreements issued by Scandinavia Township. The greatest impact of construction traffic will be experienced on Scandinavia Township roads because they are simply not designed for the amount of heavy traffic that will occur during the construction of the Astoria Station facility. This issue will be addressed in the Scandinavia Township Haul Road Agreement and will require pre-and post-construction inspections to be completed to determine what must be done to improve haul roads prior to construction and what must be done to return haul roads to preconstruction conditions.

Operational Traffic

The impact of operational traffic will be minimal as it will consist largely of motor vehicle traffic to and from the facility. 3 to 5 employees will have no significant impact on traffic patterns or traffic safety. No mitigation is recommended for operational traffic.

Determination: Mitigation Recommended – all state and local transportation permits must be obtained and haul road agreements must be developed with Deuel County and Scandinavia Township before construction hauling to the Astoria Station site commences.

8 – Fire Protection

There are three fire departments located in the Towns of Astoria, Brandt and Toronto that provide fire protection services within the six-mile study area. All three are staffed exclusively by volunteer firefighters. A total of 55 volunteer firefighters provide fire protection services within the survey area. All three fire departments have mutual aid agreements that allow neighboring firefighters to respond to events should the need arise.

Astoria, South Dakota

Fire Chief – Jason Landmark (605-690-0923)

Assistant Fire Chief – Sheldon Crooks (605-832-3351)

Volunteer Fire Department Staff20 Firefighters

Community Fire Rating “Rural Rating”

Equipment:

- 2 Pumpers (1 @ 1,000 gpm and 1 @ 800 gpm)
- 1 Tanker (1,800 gallons)
- 1 Grass Rig (250 gallons/200 gpm)
- 1 One-Ton Chevrolet 4 x 4

Ambulance Service: Hendricks, Minnesota and Clear Lake, South Dakota

Brandt, South Dakota

Fire Chief – Phil Fieder (605-881-8724)

Assistant Fire Chief – Marty Brown (605-520-3675)

Volunteer Fire Department Staff 15 Firefighters

Community Fire Rating “Rural Rating”

Equipment:

- 3 Tanker (1 @ 1,000 gallons, 1 @ 1,200 gallons and 1 @ 750 gallons)
- 3 Grass Rig (all @ 250 gallons/200 gpm)

Ambulance Service: Hendricks, Minnesota and Clear Lake, South Dakota

Toronto, South Dakota

Fire Chief – Doyle Trooien (605-794-2921)

Volunteer Fire Department Staff 20 Firefighters

Community Fire Rating “Rural Rating”

Equipment:

- 2 Pumpers (1 @ 1,200 gpm and 1 @ 1,000 gpm)
- 2 Brush Rig (all 300 gallons @ 200 gpm)
- 1 Rescue Van

Ambulance Service: Hendricks, Minnesota and Clear Lake, South Dakota

South Dakota State Fire Marshall Paul Merriman (605-773-3562) was contacted and asked to share his thoughts about the Astoria Station project. He suggested that local fire departments should be contacted by Otter Tail Power Company prior to the start of construction to provide early education and response training to impacted fire departments and to determine the capacities of each department to respond to a fire call at the project site.

Representatives from each of the three fire departments were also contacted and asked to share their thoughts about the Astoria Station project. They unanimously echoed the recommendations of the State Fire Marshall to provide early education and response training to impacted fire departments and to determine the capacities of each department to respond to a fire call at the project site. They also expressed the importance of effective communications between Otter Tail Power Company and the fire departments during planning, construction and operation of the Astoria Station Facility.

None of the responding parties anticipated any significant adverse impacts as a result of this proposed project.

Determination: No Significant Impact

9 – Health

There are no healthcare facilities located within the six-mile study area. The construction and operation of the Astoria Station facility will have no impact on healthcare facilities as none are located within the study area.

Determination: No Significant Impact

10 – Recreation

Existing recreational facilities that will be impacted by the construction and operation of the Astoria Station facility are located inside of the city limits of the three municipalities that fall within the six-mile study area. A summary of the recreational facilities can be found below.

Town of Astoria – Information provided by Astoria Finance Officer Sue Crooks

Existing Recreational Opportunities:

- City Park with picnic tables, gazebo, and playground equipment
- Lighted softball complex

Existing Camper Hook-ups (both privately owned and operated):

- Crooks Family Site – 7 hook-ups north of Astoria
- Hulsebus Family Site – 6 hook-ups south of Astoria
- The Astoria Station project would have no adverse impact on existing recreational facilities.
- No recollection of a past project having had an adverse impact on recreational facilities.

Town of Brandt – Information provided by Brandt Mayor Greg Anderson

Existing Recreational Opportunities:

- City Park with picnic tables, playground equipment and restrooms
- Lighted softball complex

Camper Hook-ups:

- The Town of Brandt has discussed installing camper hook-ups in the past and available municipally-owned property to the south of the City Park could be developed for this purpose at a reasonable cost.
- The Astoria Station project would have no adverse impact on existing recreational facilities.
- No recollection of a past project having had an adverse impact on recreational facilities.

Town of Toronto – Information provided by Toronto Finance Officer Terri Anderson

Existing Recreational Opportunities:

- City Park with picnic shelter, playground equipment and restrooms
- Lighted softball complex

- Tennis courts

Camper Hook-ups:

- The Town of Toronto owns and operates 4 camper hook-ups at the City Park site.
- The Astoria Station project would have no adverse impact on existing recreational facilities.
- No recollection of a past project having had an adverse impact on recreational facilities.

One of the only noticeable impacts to recreational facilities associated with the construction of the Deer Creek Station project was a temporary increase in the demand for camper hook-ups. Many Deer Creek Station construction workers utilized campers as their means of housing during the duration of project construction. This resulted in existing camper hook-up sites within commuting distance of the construction site being occupied for extended periods of time.

A portion of Astoria Station construction workers are likely to occupy camper hook-up sites for the duration of project construction. This will create a short-term increase in the demand for camper hook-up sites. The anticipated 13-month long construction timeframe will not result in a long-term impact to recreational facilities within the project area.

Determination: No Significant Impact

11 - Government

Governmental entities located within the six-mile study area

- Brookings County
 - Argo Township
 - Lake Hendricks Township
 - Oaklake Township
- Deuel County
 - Blom Township
 - Brandt Township
 - Norden Township
 - Scandinavia Township
- Town of Astoria
- Town of Brandt
- Town of Toronto
- Deubrook School District
- Deuel School District

Governmental Entity Impact Summary

The governmental entities surveyed responded that the proposed Astoria Station facility project construction and operation would have either no impact or a positive impact to general operations within their jurisdiction. No perceived negative impacts were expressed by any survey respondents.

Governmental Entity Taxation Summary

The governmental entities surveyed responded that the proposed Astoria Station facility project construction and operation would have either no impact or a positive impact to taxation within their jurisdiction. No perceived negative impacts were expressed by any survey respondents.

Sales Tax

Otter Tail Power Company has applied for sales/tax relief for the project under South Dakota's Reinvestment Payment Program. Applications approved under the program allow project owners to receive a reinvestment payment that does not exceed the sales/use tax paid on project costs. Otter Tail Power Company's application was approved by the South Dakota Board of Economic Development on February 14, 2017.

Property Tax Discretionary Formula

Otter Tail Power Company plans to pursue a phasing in of property taxes over the course of five years known as a discretionary formula. The projected annual property taxes will be approximately \$1 million once the discretionary formula period ends.

Determination: No Significant Impact

12 – Energy

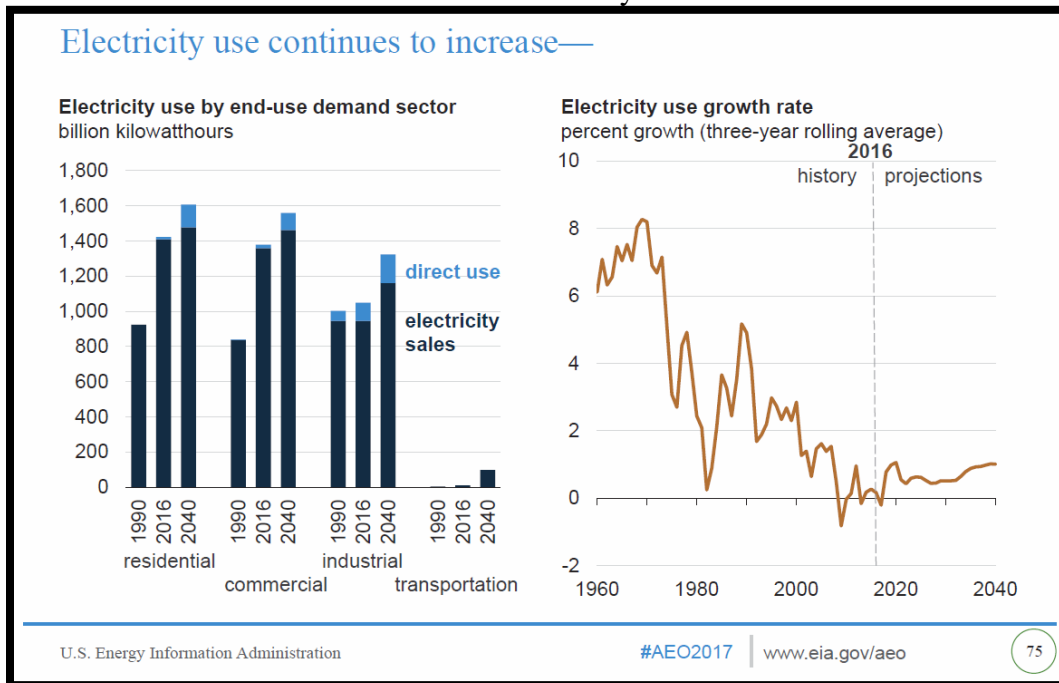
Projected increases in the consumption of electricity creates a corresponding demand for the development of new power plants. Sources of electrical generation include coal, natural gas, nuclear, renewables and petroleum. Natural gas provides a reliable and affordable source of domestically sourced power that does not produce a significant adverse to the environment.

According to the U.S. Energy Information Administration—Annual Energy Outlook 2017 (Appendix H):

“Electricity - As demand grows modestly, the primary driver for new capacity in the Reference case is the retirement of older, less efficient fossil fuel units—largely spurred by the Clean Power Plan (CPP)—and the near-term availability of renewable energy tax credits. Even if the CPP is not implemented, low natural gas prices and the tax credits result in natural gas and renewables as the primary sources of new generation capacity. The future generation mix is sensitive to the price of natural gas and the growth in electricity demand.”

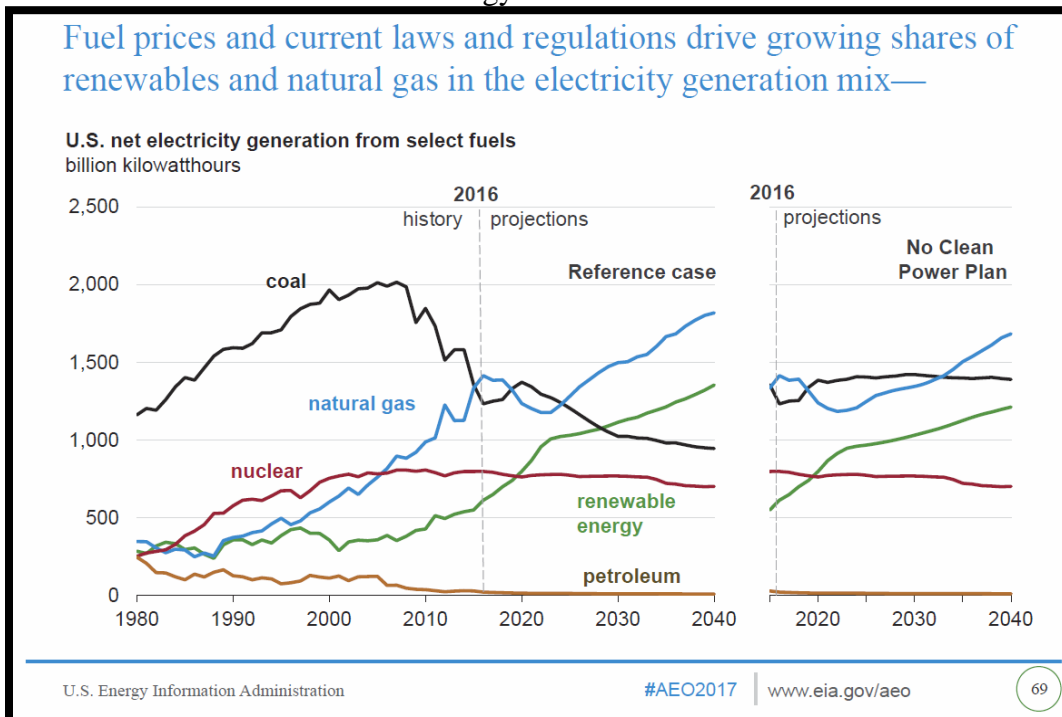
The following U.S. Energy Information Administration charts show projected electricity usage, fuel sources and natural gas usage through the year 2040.

Chart 3: Electricity Use



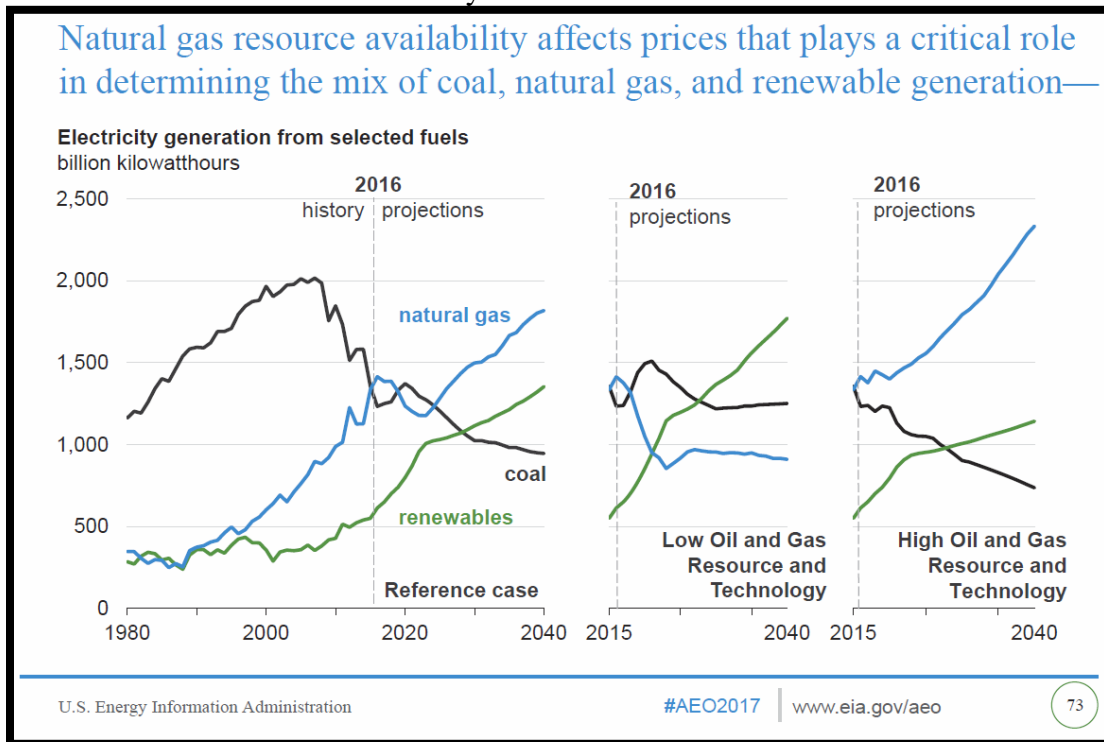
Source: U.S. Energy Information Administration—Annual Energy Outlook 2017 (Appendix H)

Chart 4: U.S. Net Energy Generation from Select Fuels



Source: U.S. Energy Information Administration—Annual Energy Outlook 2017 (Appendix H)

Chart 5: Electricity Generation from Selected Fuels



Source: U.S. Energy Information Administration—Annual Energy Outlook 2017 (Appendix H)

The proposed Astoria Station will increase the areas capacity to generate electricity while not producing emissions that have a significant adverse impact to the environment. Otter Tail Power Company has chosen a project site that can be developed without significant disturbance to adjacent properties because the site is approximately a quarter of a mile from electrical distribution infrastructure as well as a site that intersects an existing natural gas pipeline. It would be difficult to locate a more ideal site for the development of a natural gas-fired power plant than the site chosen for the development of the Astoria Station facility.

Determination: No Significant Impact

Labor Force

The Astoria Station site is located approximately 1.5 miles northwest of the Town of Astoria, South Dakota in Deuel County. The labor source identified in this section includes workers in Deuel County and the four South Dakota counties that border Deuel County: Brookings, Codington, Grant, and Hamlin Counties.

The labor force in those five counties consists of 44,516 workers and includes 4,185 construction, extraction, and maintenance workers as well as 13,800 management, professional, and related workers. 70 construction workers (1.67% of area construction, extraction, and maintenance workers) are expected to be working at the Astoria Station site during peak construction. 3-5 operational workers (0.036% of area management, professional, and related workers) are expected

to work at the Astoria Station facility after construction is complete and operation of the facility commences.

Based upon current labor force and resident occupations there appears to be a sufficient number of workers within the area to meet the construction and operational workforce demands created by the Astoria Station facility. The Astoria Station project construction will require a workforce with a variety of skills including, but not limited to, general carpenters, iron workers, millwrights, and electricians. It is expected that a portion of the construction work force will be hired locally. Recruitment of additional construction personnel from outside the affected area will usually include specialists and supervisory personnel who will temporarily relocated to the affected area.

Table 8 – County Labor Force

Area	Labor Force	Employment	Unemployment	Rate
Brookings County	19,306	18,729	577	3.0%
Deuel County	2,236	2,152	84	3.8%
Codington County	15,193	14,756	437	2.9%
Grant County	4,551	4,428	123	2.7%
Hamlin County	3,230	3,138	92	2.8%

Source: <http://dlr.sd.gov/lmic/lbtables/countylf.aspx>

Table 9 – County Labor Supply

Area	Unemployed	Underemployed	Discouraged Workers	Total Labor Supply
Brookings County	577	1,250	50	1,877
Deuel County	84	50	65	199
Codington County	437	910	50	1,397
Grant County	123	205	45	373
Hamlin County	92	140	50	282

Source: <http://dlr.sd.gov/lmic/lbtables/laborsupply.aspx>

Table 10 – Resident Occupations – Brookings, Codington, Deuel, Grant and Hamlin Counties

	Custom Region	Pct. of Total	U.S.	Pct. of Total
Employed civilian pop. 16 years and over	44,516	100.0%	145,747,779	100.0%
Management, professional, and related	13,800	31.0%	53,433,469	36.7%
Service	7,345	16.5%	26,446,906	18.1%
Sales and office	10,283	23.1%	35,098,693	24.1%
Farming, fishing, and forestry	1,425	3.2%	1,061,192	0.7%
Construction, extraction, and maintenance	4,185	9.4%	11,977,387	8.2%
Production, transportation, and material moving	7,478	17.0%	17,730,132	12.2%

Source: U.S. Census Bureau, American Community Survey, latest 5-Year Estimates

Land Values

Land values within the platted property improved by the Astoria Station project will increase substantially. Otter Tail Power Company forecasts annual property taxes to be approximately \$1 million once the facility is fully operational and 100% of property taxes are being collected.

Land values outside of the platted property improved by the Astoria Station project are not expected to increase or decrease noticeably. Adjacent properties are agricultural in nature and use and are located within the agricultural zoning district. Land values of properties located near the Deer Creek Station facility have not been adversely impacted and the same outcome is expected as a result of the construction and operation of the Astoria Station facility.

Property Tax Impacts

Although land values within the platted property improved by the Astoria Station project will increase substantially, land values outside of the project are not expected to increase or decrease noticeably. Adjacent properties are located within the agricultural zoning district.

Otter Tail Power Company plans for a phasing in of property taxes over the course of five years known as a discretionary formula. The projected annual property taxes will be approximately \$1 million once the discretionary formula period ends.

List of Appendices

Appendix A – 2015-2016 Profile of Deubrook Area School District 05-6

Appendix B – 2015-2016 Profile of Deuel School District 19-4

Appendix C – SD DENR 1 Stop Environmental and Permitting and Regulation Guide

Appendix D – SD DOT State Highway Log Aberdeen Region

Appendix E – SD DOT State Owned Structures

Appendix F – 2016 SD Traffic Flow Map

Appendix G – Deuel County Traffic Count Map

Appendix H – US Energy Information Administration – Annual Energy Outlook 2017