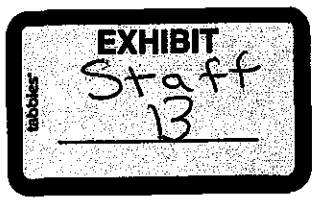
BEFORE THE SOUTH DAKOTA PUBLIC UTILITIES COMMISSION

DOCKET NO. HP14-002

IN THE MATTER OF THE APPLICATION OF DAKOTA ACCESS, LLC FOR AN ENERGY FACILITY PERMIT TO CONSTRUCT THE DAKOTA ACCESS PIPELINE

Direct Testimony of Andrea Thornton
On Behalf of the Staff of the South Dakota Public Utilities Commission
July 6, 2015



Q: Please state your name and business address.

A: Andrea Thornton, Natural Resource Group, LLC (an ERM Group Company), 1500 SW 1st Ave, Suite 885, Portland, OR, 97201.

Q: Describe your educational background.

A: I received my Bachelor's degree in 2006 from Northeastern University in Boston, MA with a duel major in Environmental Geology and Environmental Studies. During my schooling I completed a six month internship at Camp Dress & McKee soils lab in Cambridge, MA.

Q: By whom are you now employed?

A: I have been employed by Natural Resource Group, LLC (an ERM Company) since 2007. I currently hold the position of Consultant 2 in our Regulatory Group.

Q: What work experience have you had that is relevant to your involvement on this project?

A: Since working at NRG my responsibilities have included providing clients in the pipeline and transmission line industries with environmental permitting and environmental review services including assisting in the preparation of Environmental Impact Statements and Environmental Assessments under the National Environmental Policy Act and/or applicable state programs. I have worked on projects across the United States including two recent natural gas pipeline projects in the Dakotas where I have been the lead on soils and geology. I also worked on a feasibility study for a confidential client/project that had a similar alignment to the proposed Project. Prior to working at NRG I completed an internship at a soils lab in Cambridge, Massachusetts where I performed a variety of physical soils tests including grain size distribution, soil density, organic content, permeability, and soil classification.

Q: What is the purpose of your testimony?

A: I evaluated the Soils, Erosion and Sedimentation, Seismic and Subsidence, and Geological Project Constraints sections (Sections 14.5, 14.6, 14.7, and 14.8 respectively) of the Dakota Access LLC (Dakota Access) Revised South Dakota Public Utilities Commission Application (PUC) for a permit to construct the Dakota Access Pipeline under the Energy Conservation and Transmission Facility Act. My evaluation was to determine whether a sufficient level of detail was provided to characterize geology and soils (specifically erodible soils, soils with revegetation concerns, and karst terrain) as well as soil-related limitations and potential hazards associated with pipeline construction. I also evaluated Dakota Access's Agricultural Impact Mitigation Plan and Draft Stormwater Pollution Prevention Plan (SWPPP) and Section 16.1 (Vegetation) to further

review the level of detail provided for erosion control and revegetation mitigation measures to assess that areas affected by construction of the proposed project would be restored to pre-construction conditions within a reasonable timeframe after construction.

Q: What methodology did you employ?

A: I assessed the information provided in Sections 14.5, 14.6, 14.7, 14.8 and 16.1 of Dakota Access's Revised Application by comparing it to information which is normally provided in comparable industry-standard applications for state and federal permits. I also assessed the information provided in the SWPPP and the Agricultural Impact Mitigation Plan by comparing it to multiple project-specific construction mitigation plans used for projects in a similar geographic region. In addition I applied my knowledge of soil characteristics and limitations as well as my knowledge of the Natural Resources Conservation Service (NRCS) Soil Survey Geographic Database (SSURGO) to determine if soils were properly classified by their limitations and if the appropriate mitigation measures were applied. I also reviewed Dakota Access's responses to PUC staff's data requests where Dakota Access provided additional information on certain topics.

Q: Did you review sections 14.5, 14.6, 14.7, and 14.8 of the Revised Application that address soil types and geological features along the proposed route?

A: Yes I reviewed sections 14.5, 14.6, 14.7, and 14.8 and the Revised Application as well as sections 16.1, the SWPPP, the Agricultural Impact Mitigation Plan, and Dakota Access's responses to PUC staff's data requests that were applicable to soils, geology, and revegetation.

Q: Does the proposed route cross any soil types that have the potential for erosion? If so, please explain.

A: Yes the proposed route crosses soil types that have the potential for erosion. The industry standard for evaluating soils (including soils that are erodible by water or wind) is to use the SSURGO database, which is a digital version of NRCS soil surveys. This database provides the most detailed level of soils information available for natural resource planning and management and is linked to an attribute database that provides the proportionate extent of the component soils and their properties for each soil map unit.

Highly erodible soils are typically identified based on three soil parameters available in the SSURGO database that are directly related to the susceptibility of a soil type to erosion by water or wind. These parameters are: land capability subclass; slope; and wind erodibility group (WEG). Typically, map units with a land capability subclass designation of 4e through 8e (which are considered to have severe to extreme erosion limitations for agricultural use), and/or soils with

an average slope greater than 8 percent are identified as susceptible to water erosion. Wind erodibility is assessed using WEG designations. A WEG is a grouping of soils that have similar surface-soil properties affecting their resistance to soil blowing, including texture, organic matter content, and aggregate stability. Soils in WEG 1 and 2 include sandy-textured soils with poor aggregation and are typically classified as highly erodible by wind.

Section 14.5 of the Dakota Access Revised Application states that "*soils with a land capability class and subclass of Ve through VIIIe are considered to be highly erodible. Soils with a land capability class and subclass of IIIe through IVe are considered to be moderately erodible. The remaining capability classes and subclasses are considered to have low erodibility.*" The section goes on to discuss soils with slopes greater than 8 percent, however wind erodible soils are not discussed separately from general soil erodibility.

Revised Exhibit C lists the soil characteristics for each soil map unit within the Project area by county (including erosion potential and slopes greater than 8 percent). Revised Exhibit A3 provides maps which accurately identify locations of specific soils along the proposed pipeline right-of-way. The Revised Application does not provide any quantifiable measurement for the magnitude of erodible soils. Using Exhibit C I was able to add up the pipeline crossing lengths provided to determine that 28,057 feet (8.3 miles) are classified as having a high erosion potential and 196,700 feet (37.3 miles) are classified as having a moderate erosion potential. In addition 8,493 feet (1.6 miles) are classified has having steep slopes (greater than 8 percent) that were not also classified as having a high or moderate erosion potential.

In order to determine where the areas are along the proposed pipeline one would need to have Revised Exhibit A3 and Revised Exhibit C side by side to run through the mapping and soil limitations. A Federal Energy Regulatory Commission (FERC) Minimum Filing Requirement is to provide a milepost by milepost description of impacts on soils. This is typically done by providing a milepost in/out crossing table of soil units and their characteristic and limitations. This type of table would be useful for helping to determine the locations of erodible soils along the proposed pipeline.

Q: Does Dakota Access propose any methods for mitigating erosion during construction or operation of the pipeline? If so, please explain.

A: Yes, Dakota Access proposed measures for mitigating erosion during construction and operation of the pipeline within the SWPPP and the Agricultural Impact Mitigation Plan. Section 3.1 of the SWPPP lists temporary and permanent erosion control measures that would be taken during construction and operation of the proposed pipeline including temporary slope breakers, silt fences, hay/straw bales, temporary trench plugs, permanent slope breakers, and

revegetation. Sections 6b and 6c of the Agricultural Impact Mitigation Plan describes topsoil separation and replacement and prevention of erosion.

Q: In your opinion, does the Stormwater Pollution Prevention Plan adequately mitigate erosion?

A: The SWPPP provides standard erosion protection and mitigation measures seen across the board in the pipeline industry, however, it does not address any locations that will require site-specific erosion and sediment control plans. Dakota Access has stated that they will work with landowners and land managing agencies through the construction/restoration process and also provided Revised Exhibits A3 and C which combined can help identify areas with higher erosion potential. Neither the Revised Application nor the SWPPP state that final pre-construction design efforts will include site-specific drawings and plans that will identify and locate the type of BMPs proposed for specific locations with highly erodible soils. I recommend that the PUC require that pre-construction design efforts include BMPs specific to locations with higher erosion potential.

Q: Do you have any additional recommendations for mitigating erosion concerns?

A: In addition to having final pre-construction design efforts include BMPs specific to locations with a higher risk of erosion potential, I recommend the PUC require a milepost in/out table showing the areas that are more prone to erosion so the Environmental Inspectors (EIs) can have the data more readily accessible during construction and restoration to know where the more "problem areas" are expected to be. This table should include wind erodible soils if any are crossed by the proposed Project.

Neither the Revised Application nor the SWPPP make mention of winter construction or stabilization procedures. If construction is to take place over the winter months, I recommend that the PUC require a Winter Construction Plan be provided to address these erosion control and stabilization techniques prior to issuing Dakota Access a permit. The FERC Plan (Section III part I) requires projects that have planned construction during winter weather conditions to have a project-specific winter construction plan that addresses winter construction procedures, stabilization and monitoring procedures, and final restoration procedures. Another industry specific guidance document is the INGAA Foundation *Planning Guidelines for Pipeline Construction During Frozen Conditions.*

The SWPPP is also vague in stating that "*temporary sediment barriers will remain in place until permanent revegetation measures have been judged successful.*" I would recommend the PUC require a more quantifiable measurement to determine when revegetation is successful before granting a permit. For example, a typical standard for pipeline projects is that revegetation

in non-agricultural areas will be considered successful if the vegetative cover is sufficient to prevent the erosion of soils on the disturbed ROW and density and cover are similar to that in adjacent undisturbed areas. Sufficient coverage in upland areas is defined when vegetation has a uniform 70 percent vegetative coverage. Revegetation efforts are to continue until revegetation is successful.

Q: Does the proposed route cross any geological features that have the potential for subsidence or land movement? If so, please explain.

A: Yes the proposed route crosses geologic features that have the potential for subsidence or land movement. As indicated in the Revised Application, "*potential karst is present from MP 316.5 to MP 348.3, as well as, MP 455.8 to MP 471.5*". The Revised Application goes on to state that the Project crosses about 188 miles of the Pierre Shale which is the only geologic formation in the project area that is susceptible to landslides. Upon review of the USGS Landslide Incidence and Susceptibility GIS data, the majority of the proposed Project crosses land with a low landslide incidence and susceptibility. The only lands with moderate and high susceptibility in the Project area occur in Campbell County associated with the Missouri River (which would not be crossed in South Dakota) and a portion of Turner County which would not be crossed by the proposed alignment.

As stated in Dakota Access's March 18, 2015 Data Request Responses Nos. 12 and 13, as well as Dakota Access's June 12, 2015 Interrogatory Response 2-21, while the proposed Project crosses regions that have the potential for karst topography based on the underlying bedrock, this does not mean that karst topography is present. I agree with this determination. South Dakota has deep glacial drift deposits which overlay the carbonate rock formations that have the potential for karst topography, thereby limiting the risk of surface subsidence.

Q: In your opinion, does Dakota Access address the concerns with subsidence or land movement in a manner that is consistent with industry standard practices during pipeline routing?

A: Yes, given the low risk of potential subsidence or land movement in the proposed Project area I agree that Dakota Access's proposed mitigation methods are consistent with industry standards. If voids or other signs of karst topography are found during construction Dakota Access is proposing to conduct further site-specific evaluations by a qualified geologist or geotechnical engineer to provide input on mitigation measures. Dakota access provided examples of specialized construction techniques which may be used as mitigation measures if karst is found during construction, however, mitigation would be determined on a case by case basis.

Q: Do you have any additional recommendations for Dakota Access with regards for mitigating risks associated with subsidence or land movement?

A: No I do not have any additional recommendations with regard to mitigating risks associated with subsidence or land movement.

Q: Does the proposed route cross any soil types that could inhibit future revegetation of ground disturbed during construction activities? If so, please explain.

A: Yes, the proposed route crosses soil types that could inhibit future revegetation of ground disturbed during construction activities. Revised Exhibit C shows, by map unit, the revegetation potential for each map unit within the Project area. Section 14.5 of the Revised PUC states that *"The majority of soils impacted by the Project have moderate to high revegetation potential. Soils with low revegetation potential typically have high compaction and/or erosion potential, have slopes greater than 8 percent, and are not classified as prime farmland."* The Revised Application does not identify which soil characteristics and/or limitations where used to make these revegetation potential categories.

In my experience using SSURGO databases to analyze soil characteristics, the industry standard way to identify soils with revegetation concerns is to look at the component soil series that have a surface texture of sandy loam or coarser, are moderately well to excessively drained, and have an average slope greater than or equal to nine percent. Not knowing exactly how Dakota Access determined their revegetation potential categories I cannot be certain if their groupings are consistent with industry standards. Using the categories provided in Exhibit C I was able to add up the pipeline crossing lengths provided to determine that 65,917 feet (12.5 miles) are classified as having a low revegetation potential.

As stated earlier in my testimony, in order to determine where the areas are along the proposed pipeline one would need to have Revised Exhibit A3 and Revised Exhibit C side by side to run through the mapping and soil limitations. A FERC Minimum Filing Requirement is to provide a milepost by milepost description of impacts on soils. This is typically done by providing a milepost in/out crossing table of soil units and their characteristic and limitations. This type of table would be useful for helping to determine the locations of soils with revegetation concerns along the proposed pipeline.

Dakota Access does not identify if any areas with saline, sodic, and saline-sodic soils would be crossed by the proposed Project. These soil types can be linked to revegetation issues and loss of agricultural productivity if soils are not handled properly during construction.

Q: In your opinion, does Dakota Access have the proper plans in place to manage these soil types in order to facilitate revegetation after pipeline construction?

A: Dakota Access does not provide any specific mitigation measures in the SWPPP that would be used in areas with revegetation concerns. The SWPPP states that one seed mix would be used along the entire alignment in South Dakota (unless otherwise instructed by applicable permits or land managing agency requirements). The SWPPP does not state if Dakota Access consulted with the NRCS regional soil scientists to receive seed mix recommendations.

The SWPPP does state that Dakota Access will use fertilizer and agricultural lime and that final revegetation standards will be determined through discussions with the individual state and local agencies through the permit process, however, it is unclear as to whether site-specific measures will be developed for areas with revegetation concerns.

Q: Do you have any additional recommendations for Dakota Access in regards to handling these soil types in order to enhance revegetation after pipeline construction?

A: I recommend that Dakota Access consult with regional NRCS Soil Scientists (or provide documentation of consultation if already taken place) to determine any seed mix changes needed for the lands with revegetation concerns or any recommended site-specific mitigation measures.

I also recommend creating a milepost in/out table showing the areas that have revegetation concerns so the EIs can have it on hand during construction and restoration to know where the more "problem areas" are expected to be.

The Revised Application, SWPPP, and Agricultural Impact Mitigation Plan do not mention winter construction, stabilization procedures during frozen conditions, or seeding over winter. If construction is to take place over the winter months, I recommend that the PUC require a Winter Construction Plan be filed prior to issuing Dakota Access a permit. Please refer to my earlier testimony for examples of industry standard documents that provide recommendations for winter construction plans.

Q: Does this conclude your testimony?

A: Yes.

Andrea Thornton

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an ERM Group company

Andrea is a Consultant in Natural Resource Group, LLC's (NRG) Portland office. She has been working in the industry since 2007 and has experience in field survey coordination; agency consultation; preparation of geology, soils, and land use sections of environmental impact statements (EIS), environmental assessments (EA), and resource reports; soils data analysis; physical soils testing; and laboratory environmental safety inspections.

Selected Project Experience

- Spectra Energy, Atlantic Bridge Project, 2015 to Present, Approximately 18 miles or varying size natural gas pipeline and associated aboveground facilities in New York, Connecticut, and Massachusetts: Deputy Project Manager on a Federal Energy Regulatory Commission (FERC) third-party EA, planning workloads, coordinated agency and public meetings, and responsible for Socioeconomics section of EA.

- ExxonMobil, Alaska LNG Third-Party EIS Project, 2014 to Present, Approximately 800 miles of new 42-inch diameter pipeline in Alaska: Section Lead responsible for preparation of Soils section of a Federal Energy Regulatory Commission (FERC) third-party EIS.
- Venture Global, Venture Global Liquefaction Project, 2014 to Present, Approximately 42 miles of 42-inch diameter pipeline in Louisiana and new LNG terminal: Section Lead responsible for researching and writing soils resource report.

- Dominion Transmission Inc., Atlantic Coast Pipeline, 2014 to Present, Approximately 296 miles of 42-inch diameter pipeline, 178 miles of 36-inch diameter pipeline, 76 miles of 20-inch diameter pipeline, and 3 miles of 16-inch diameter pipeline in Virginia, West Virginia, and North Carolina: Section Lead responsible for researching and writing soils resource report. Agency coordination to plan for soil surveys on national forest land.

- Dominion Transmission Inc., Supply Header Pipeline, 2014 to Present, Approximately 35 miles of 36-inch diameter pipeline and 4 miles of 30-inch diameter pipeline in West Virginia and Pennsylvania: Section Lead responsible for researching and writing soils resource report.

- WBI Energy, Wind Ridge Pipeline Phase II Project, 2014 to Present, Approximately 96 miles of new 16-inch diameter pipeline in North Dakota: Section Lead responsible for researching and writing soils resource report and client prepared EA.

- Dominion Virginia Power, Haymarket 203 kilovolt (kV) Transmission Line Project Environmental Route Review, 2014 to Present, Approximately 6 miles of new 230 kV transmission line in Prince William County and the Town of Haymarket in Virginia: Section Lead responsible for route review and preparation of Land Use, Recreation, Geology, and Soils sections of Routing Study, State Corporation Commission (SCC) Application, and Department of Environmental Quality (DEQ) supplement documents.

- Paiute Pipeline Company, Elko Expansion Project, January 2014 to Present, Approximately 35 miles of new 8-inch diameter pipeline in Elko County Nevada: Section Lead responsible for resource report review and preparation of Geology, Soils, and Water resource sections of the EA.

- Spectra Energy, Algonquin Incremental Project, 2013 to Present, Approximately 38 miles of varying size natural gas pipeline and associated aboveground facilities in New York Connecticut, Rhode Island, and Massachusetts: Section Lead responsible for resource report review and preparation of Geology and Soils sections of EIS.

- Dominion Virginia Power, Remington CT – Warrenton 230 kV Double Circuit Line, Vint Hill – Wheeler and Wheeler – Louden 230 kV Transmission Lines Project Environmental Route Review, 2013 to Present, Approximately 6 miles of 230 kV new and existing electric transmission line in Fauquier and Prince William counties Virginia: Section Lead responsible for route review and preparation of Land Use, Recreation, Geology, and Soils sections of Routing Study, State Corporation Commission (SCC) Application, and Department of Environmental Quality (DEQ) supplement documents.

- Quanta Services, Bluegrass Memphis Pipeline Project, 2013 to 2014, Approximately 91 miles of new NGL pipeline in Tennessee, Arkansas, and Mississippi: Project Team Member responsible for survey tracking and coordination with sub consultants on edits to daily progress reports.

- Spectra Energy, Patoka Express Constraints Analysis, August 2013 to October 2013, Approximately 1,500 miles of 30-inch diameter pipeline and 32 pump stations in Montana, Wyoming, Nebraska, Kansas, Missouri, and Illinois: Project Team Member responsible for researching and writing various sections of the Constraint Study including environmental features, state and federal permits, and issues analysis.

- ONEOK, Sterling III Pipeline Project, July 2013 to October 2013, Approximately 550 miles of 16-inch NGL pipeline in Oklahoma and Texas: Project Team Member responsible for writing the Request for Proposal to Provide Post-Construction Restoration Services and working with bidders through the process.

- Quanta Services, Texas Gas Abandonment Project, January 2013 to December 2013: Project Team Member responsible for survey tracking; Section Lead responsible for preparing resource reports and associated plans for Geology, Soils, and Land Use sections.

- Portland General Electric Company, Cascade Crossing Transmission Project, 2012 to 2013, 210 miles of new 500 kilovolt (kV) electric transmission line, upgrade of an existing 230 kV line, and related facilities in Oregon: Project Team Member responsible for contributing to the preparation of a third-party EIS for the U.S. Forest Service (FS); and preparing the Geology, Soils, and Recreation sections and portions of the Land Use, Water Resources, and Vegetation sections of the EIS.

- Williams Gas Pipeline, Kalama Lateral Pipeline Project, 2011 to 2012, 3.1 miles of 16-inch-diameter natural gas pipeline to provide 62,888 Dth/d of natural gas to a proposed 346 megawatt (MW) natural gas-fired combustion turbine power plant in southwestern Washington: Project Team Member responsible for preparing Soils section and collaborating in preparation of other Resource Reports with authors and client as needed.

- Questar JL 47 Loop Pipeline Project, April 2012 to December 2012, Approximately 15 miles of 16-inch-diameter natural gas pipeline in Duchesne County Utah: Project Team Member

responsible for coordinating paleontological surveys, researching and writing Geology and Paleontology sections of project documents, and running and interpreting soils analysis for the project.

- Dominion Virginia Power, Chickahominy to Skiffes Creek 500 kV and Skiffes Creek to Whealton 230 kV Transmission Line Project Environmental Route Review, 2011 to 2012, Approximately 72 miles of 230 kV and 500 kV new and existing electric transmission line in multiple counties in Virginia: Section Lead responsible for preparation of Land Use, Recreation, Geology, and Soils sections of Routing Study, State Corporation Commission (SCC) Application, and Department of Environmental Quality (DEQ) supplement documents.

- Dominion Virginia Power, Lexington to Dooms 500 kV Transmission Line Project, September 2012 to October 2012, Approximately 39 miles of 500 kV lines in Virginia: Project Team member responsible for preparation of Land Use, Geology, Recreation, and Soils sections of project documents.

- Williams Gas Pipeline, Piceance Anomaly Digs, January 2012 to August 2012, EA for anomaly digs along existing 48-mile Piceance Lateral in Rio Blanco County Colorado: Project Team Member responsible for researching and writing Soils, Surface and Ground Water, Floodplains, Hydrology, Water Rights, and Paleontology sections of the EA.

- Kinder Morgan, Port Westward Coal Export Terminal Project, March 2012 to April 2012, Coal export terminal in St. Helens, Oregon: Project Team Member responsible for researching federal, state, and local permits applicable to this type of project and assisting with preparing a written permit process report for client.

- Dominion Virginia Power, Cloverhill to Liberty, 230 kV Transmission Line Project, January 2012 to April 2012, Approximately 8 miles of new 230 kV transmission line: Project Team Member responsible for researching and writing Land Use, Recreation, Geology, and Soils section of related project documents.

- Spectra Energy, New Jersey-New York Expansion Project, 2011 to 2012, 20 miles of multi-diameter natural gas pipeline and compressor station modifications in New Jersey, New York, and Connecticut: Project Team Member responsible for assisting with alternatives sections of a Federal Energy Regulatory Commission (FERC) third-party EIS.

- Marshal Line 6B Incident Response Public Affairs, August 2010 to September 2010: Managed local call center in Marshall Michigan for Enbridge, responsible for training local hires, reporting oiled wildlife to U.S. Fish and Wildlife Service (FWS), passing landowner requests on to right-of-way agents and claims adjustors, maintaining "Emergency Response Tracking" database, and speaking with distressed/upset landowners. Compiled data and created daily morning reports, met with client on a daily bases to answer questions, and attended nightly meeting to report status of call center.

- Palomar Gas Transmission, LLC, Palomar Gas Transmission Project, 2007 to 2010, 221 miles of 36- and 24-inch-diameter natural gas pipeline in Oregon: Project Team Member responsible for assisting with survey coordination for environmental field survey efforts; assisting biological leads with research, quality control, and data compilation; assisting with

preparing FERC resource reports for Geology and Ground Water; and participating in tribal consultations and cultural survey coordination for the project.

- Guardian Pipeline, L.L.C., Guardian Expansion and Extension Project, 2007 to 2010, 119 miles of 30-, 20-, and 16-inch-diameter natural gas pipeline and two new compressor stations in Illinois and Wisconsin: Project Team Member responsible for construction compliance tracking and task support.

- NV Energy, Fort Churchill to Harry Allen Substation, 2009 to 2010, 484 miles of 345 kV electric transmission line in Nevada: Project Team Member responsible for analyzing soils data and writing Soils, Geology, and Paleontology sections of siting and routing report.

- Sierra Pacific Power Company, Blackhawk to Ft Churchill, and Falcon to Humboldt Projects, September 2008 to December 2008, a 345 kV Electrical transmission line in Nevada: Responsible for supporting soils lead with SSURGO/STATSGO database management and queries for two 345 kV electric transmission line projects in Nevada.

- Sunstone Gas Transmission Project, July 2008 to November 2008, approximately 598-mile-long natural gas pipeline in Wyoming, Idaho and Oregon: responsible for assisting biological leads with fisheries research and compiling a waterbody crossing table.

Education and Training

- B.A., Environmental Geology, Northeastern University, Boston, Massachusetts, 2006
- B.A., Environmental Studies, Northeastern University, Boston, Massachusetts, 2006
- National Environmental Policy Act Writing the Perfect EA/FONSI, or EIS Training, 2014
- FERC Environmental Compliance Seminar, Louisiana, 2008
- FERC Regulatory Overview and Guidance Seminar, Louisiana, 2008
- Occupational Safety and Health Administration (OSHA) 24 hour Hazardous Waste Operations and Emergency Response (HAZWOPER) training, Massachusetts, 2005