

Regulated Environment's Impact on



2011

Green Jobs in South Dakota's Economic Landscape







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Labor Market Information Center

All photographs used in this publication were provided by the South Dakota Department of Tourism. On the cover, clockwise from top left: wind energy in South Dakota, Pactola Lake, aerial view of Black Hills, Glacial Lakes and Oahe Dam. On page 2, Mt. Rushmore. On page 9, Falls Park. On page 16, Big Stone Lake. On page 24, Glacial Lakes. On page 32, Homestake Mine. On page 38, Falls Park.

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Introduction

The U.S. Department of Labor, Employment and Training Administration (ETA) provided funding for the Northern Plains and Rocky Mountain Consortium in December 2009 in response to an application for State Labor Market Information Improvement Grants. The Consortium is comprised of Labor Market Information (LMI) research offices in six contiguous states (Montana, Nebraska, Iowa, South Dakota, Utah and Wyoming). Broadly, the funds are to be used to maximize the efficiency of the current and future labor market by identifying the major features and trends in labor supply and demand, including occupational characteristics and skills needs associated with the greening of the economy.

The consortium's work includes the use of multiple methodologies to research the green economy, including employer surveys, content analysis of administrative records, employment and training program evaluation, and contracting with academic experts for insight on developing technologies and their potential impact on the demand for labor. Another project was researching the impact which regulations have on green jobs, specifically to discern if regulatory requirements result in any green jobs. Each state took the lead in a particular consortium project and in developing the research strategy for that project. LMI offices in Wyoming and South Dakota had the lead on the consortium task titled "Regulatory Impact on Green Jobs." This publication exhibits the information South Dakota gathered as a result of that research.

Much of the information on South Dakota regulatory programs contained in this publication was found on the South Dakota Department of Environment and Natural Resources (DENR) website (http://denr.sd.gov). Additionally, the South Dakota Department of Labor's Labor Market Information staff worked with South Dakota Department of Environment and Natural Resources (DENR) staff during November 2010 to identify the programs, rules and regulations that are part of the regulatory process. This report will identify the public and private industries and firms involved in regulatory processes, such as construction reclamation, watershed protection, and mitigation of environmental and industrial impacts resulting from construction of new power plants and utility lines. The purpose of the partnership between the two state agencies was to identify and quantify skill and competency requirements, develop lists of renewable energy businesses and related employment, quantify anticipated industry growth and identify technological applications affecting labor requirements unique to the regulatory environment.

South Dakota Department of Environment & Natural Resources

The mission of the DENR is "to protect public health and the environment by providing monitoring and natural resource assessment, technical and financial assistance for environmental projects, and environmental regulatory services; all done in a manner to protect South Dakota's environment and natural resources for today and tomorrow while treating everyone as our customer and exceeding their expectations." The department is comprised of two divisions—Division of Environmental Services and the Division of Financial and Technical Assistance. The Division of Environmental Services conducts most of the regulatory work in six areas: air quality, drinking water quality, groundwater quality, surface water quality, minerals and mining, and waste management.



Air Quality Regulations & Programs

The goal of the Air Quality Program is to maintain air quality levels in South Dakota that protect human health, safety and welfare and the National Ambient Air Quality Standards established through the Federal Clean Air Act. The department achieves this goal by monitoring the ambient air quality throughout the state, permitting businesses and facilities that emit air pollution, and ensuring compliance with state laws and rules.

South Dakota Air Quality Laws and Rules: Air quality is regulated by South Dakota Codified Law Chapter (SDCL) 34A-1 Air Pollution Control and South Dakota Administrative Rules Chapter (ARSD) 74:36 Air Pollution Control Program.

Ambient Air Quality Monitoring: The Ambient Air Quality Monitoring staff implements studies and investigations to determine compliance with the National Ambient Air Quality Standards. The standards require testing particulate matter (PM) or dust that is both fine (2.5 PM) and coarse (PM10). The United States Environmental Protection Agency (EPA) requires the DENR to conduct an annual review of the state's ambient air monitoring network to make sure it meets the monitoring objectives.

The air quality program operates a network of 13 locations which test fine and/or coarse particulate matter. They also operate six ozone monitors, five sulfur dioxide monitors and five nitrogen oxide monitors throughout South Dakota. Air Toxic data is collected at one site located in Sioux Falls and at a site in Union County. DENR operates one carbon monoxide monitor in Union County and one in Sioux Falls. DENR contracts with consultants to run the testing programs at the sites. They also contract with testing labs to analyze the test data. The air quality staff works with four contractors/consultants to conduct the testing programs and three laboratories to analyze the test data.

Air Emission Permit Fees: The federal Clean Air Act of 1990 required the development of a national permit program for major sources of air pollution. This permit program is called the Title V air quality permit program. To pay for implementing the permit program, Congress required in the federal Clean Air Act that air pollution sources subject to the permitting program must pay a fee to cover the reasonable direct and indirect costs associated with administering the program.

The Air Emission Fee regulations (ARSD 74:37) outline the fee structure for Part 70, Operating Permit Sources, except ethanol plants. Air emission fees are not assessed for minor sources. An **administrative fee** is assessed based on the amount of actual emissions from a facility on an annual basis. The dollar-per-ton fee is broken down by the emission rates for total suspended particulate matter, sulfur dioxide, nitrogen oxide, volatile organic compounds and hazardous air pollutants emitted to the air by the facility during the previous calendar year.

An **emission fee** is also assessed for actual emissions. Asphalt plant and rock crusher operations pay an annual flat fee. By paying the flat fee, these operations can by-pass filing the annual operational report. Coal-fired power plants with a maximum heat output of 400 megawatts or greater pay an annual flat fee, but are still required to submit an annual operational report. Sources subject to flat fees are not subject to the administrative or dollar-per-ton fee.

An application fee of $125 is assessed for a construction permit and an operating permit for major sources. The fee structure under ARSD 74:37 is evaluated each year and is based on the needs of the program.

Air Emission Permit Fees for Ethanol Plants: Ethanol plants are not subject to the air fees established in ARSD 74:37. Instead, SDCL 34A-1-58.1 establishes air fees for ethanol plants. The annual air fee for an ethanol plant is established as an administrative fee and an emissions fee per ton of total suspended particulate matter, sulfur dioxide, nitrogen oxide, volatile organic compounds and hazardous air pollutants emitted to the air by the ethanol plant during the previous calendar year. A one-time application fee is assessed to each new ethanol plant.

Prevention of Significant Deterioration: The Prevention of Significant Deterioration (PSD) program is designed to protect the air quality in areas that are in attainment with the national ambient air quality standards in South Dakota. The program requires a new business or existing business that undergoes a modification to their existing operations to obtain a pre-construction permit, if the source falls within the applicability requirements of the regulations. The pre-construction permit ensures the national ambient air quality standards will not be exceeded. The Air Quality Program received delegation of the PSD program from EPA in July 1994. Prior to this date, EPA issued the pre-construction permit. The Air Quality program adopted the PSD regulations by reference from 40 CFR Part 52.21. EPA approved DENR's PSD program in its State Implementation Plan in the Federal Register on December 21, 2007, which became effective on January 22, 2008.

The PSD program requires a new business or existing business that undergoes a modification to their existing operations to obtain a pre-construction permit. It is basically a three-step process. DENR air quality staff work with the company's consultant/contractor during the application process. During the construction phase, the primary contact would be with the company and/or the construction consultant/contractor. During operations, an air quality staff person works with another consultant/contractor who performs stack testing. A stack test measures the amount of a specific regulated pollutant being emitted, demonstrates the capture efficiency of a capture system, or determines the destruction or removal efficiency of a control device used to reduce emissions at facilities subject to the Clean Air Act.

In addition to the stack testing, the air quality program conducts onsite inspections to determine compliance with monitoring, recordkeeping, reporting and testing requirements in the PSD permit. The DENR contact at the business would ordinarily be with the manager, the safety officer or the environmental specialist who is responsible for operations, record-keeping and monitoring at the facility. In addition, the air quality program has contact with some of the employees performing work activities related to environmental regulations, including electricians, plumbers, equipment maintenance people, etc. These activities can involve from one to 10 people, although typically it is only one or two employees.

The businesses regulated under the PSD program are normally large facilities, including gas-fired electrical plants or coal-fired peaking (electrical) plants. Inclusion in the PSD program is based on the amount of emissions. Based on their emissions, ethanol plants would be included under this function. However most of the ethanol plants avoid inclusion by restricting emissions. The cement plant in Rapid City, Starmark Cabinetry in Sioux Falls and the Soybean Oil Extraction plant near Volga are regulated under this program. The new Hyperion Energy Center and Basic Electric Deer Creek Station near Brookings also fall under this permitting program. After construction, these businesses will still need to obtain a Title V permit.

The air quality staff currently works with 12 businesses under the PSD program. However, approximately 150 businesses have limited their modifications and are instead included under the Title V program.

Acid Rain: Acid Rain is also a permitting function similar to the PSD program. Under the Clean Air Act Amendments of 1990, EPA established requirements for acid rain sources. This program is designed to reduce air emissions that contribute to smog and acid rain. These regulations establish standards for sulfur dioxide and nitrogen oxide air pollutants and monitoring and reporting requirements. Electrical generating facilities are the main sources addressed under these regulations. The Air Quality Program's acid rain regulations are in ARSD 74:36:16. These rules have been adopted by reference from the federal regulations listed in 40 CFR Part 72 through 75.

The DENR air quality staff currently works with five different firms under the Acid Rain program. Coal-fired (electrical) plants, such as Otter Tail Power, and electric peaking plants, such as Northwestern Public Service Company and Northern States Power Company, are the only facilities covered under the acid rain source regulations.

Pollution Control: The DENR air quality program issues permits for facilities which are sources of air pollution. This is primarily a permitting function similar to the PSD program. In 2010, the DENR revised the Administrative Rules of South Dakota (ARSD) Article 74:36 – Air Pollution Control Program to adopt new federal standards and implement a construction permit program for those sources not required to obtain a PSD or NSR preconstruction permit. After construction, the facility will still be required to obtain the appropriate air quality operating permit.

Facilities must obtain a construction permit and, within one year after starting operation, apply for a Title V (Part 70) permit if the source meets the following criteria: emits more than 100 tons per year of a regulated pollutant, emits more than 10 tons per year of one hazardous pollution or more than 25 tons per year of a combination of hazardous pollutants, falls under the applicability requirements for the New Source Performance Standards, or falls under the Maximum Achievable Control Technology Standards.

A facility must obtain a construction permit and, within one year after starting operation, apply for a minor sources operating permit if the facility is an air pollution source that is not a Part 70 source and has uncontrolled potential emissions of less than 100 tons per year, but greater than 25 tons per year of a regulated air pollutant.

The air quality program also provides a general permit. A general permit is required for an air pollution source that may be a portable or stationary Part 70, or Minor source. Source categories in which general permits have been developed include asphalt plants, rock crushers,

concrete plants and grain elevators. (Storm water requirements for asphalt plants, rock crushers and concrete plants have to be addressed during the air quality permitting process.) Some manufacturing facilities and paint-spraying facilities are also included.

Facilities operating the following types of equipment must identify the pollution source when submitting their general application for a pollution control permit, including: boiler, turbine or furnace operation; generators and fire pumps; incinerator operation; insignificant activities; kiln and dryer operation; miscellaneous process operation; spray booth operation; and storage tanks. Pollution control data sheets must accompany the general application for the following types of pollution control equipment: bag house; cyclone; electrostatic precipitator; miscellaneous controls, thermal oxidizer; and wet scrubber.

In addition to permitting, the air quality program conducts onsite inspections to determine compliance with the permit requirements, such as monitoring, recordkeeping, reporting and testing. The DENR contact at the business would ordinarily be with the manager, the safety officer or the environmental specialist who is responsible for operations, recordkeeping and monitoring at the facility. In addition, the air quality program has contact with some of the employees performing work activities related to the permit requirements, including electricians, plumbers, equipment maintenance people, etc. These activities can involve from one to 10 people, although typically it is only one or two employees.

There is a federal requirement that workers who conduct visual emission observations must be certified. The DENR provides individual emission evaluation certification (smoke school) training for those workers. This is a two-day field training exercise. Smoke school certification must be repeated every sixth months.

When obtaining a new permit or renewing an expired permit, some facilities are required to conduct a stack performance test. To assist with this requirement, the DENR provides a national listing of stack testing companies. The air program has also compiled a listing of air quality consultants for permitting, assessments, testing, etc. DENR provides a list of consultants who have requested to be included in such a list. The list is not all-inclusive.

The air quality program currently works with approximately 300 Title V permitted businesses and 400 minor sources permitted firms under the pollution control program.

New Source Performance Standards (NSPS): EPA has developed new source performance standards in 40 CFR Part 60 for certain source categories. The Air Quality Program adopts the federal regulations by reference in ARSD 74:36:07. The state rules reference the federal citations *(40 CFR 60).*

This function deals with regulations to control particulate matter, sulfur dioxide, nitrogen oxide, carbon monoxide and volatile organic compound emissions. The regulations establish emission standards, monitoring requirements and reporting requirements. A wide variety of business types are regulated by these standards, including asphalt plants, metallic and non-metallic mineral processors, cement manufacturers, boilers, incinerators, etc. Other sources would include the emergency generators for a coal fired utility plant. Businesses must obtain a Title V permit before construction can occur.

New Source Review: The New Source Review program is designed to protect the air quality in areas not attaining the national ambient air quality standards in South Dakota when new

businesses are built or existing facilities modify their existing operations. The Air Quality Program has developed New Source Review regulations for South Dakota, and they are listed in ARSD 74:36:10. Since all areas in South Dakota have met the national ambient air quality standards, the air quality program is not required to conduct a review when new businesses are built or existing facilities modify their operations.

Hazardous Emissions (MACT): Under the Clean Air Act Amendments of 1990, EPA devised this program to address hazardous air pollutant emissions. This program was called the Maximum Achievable Control Technology (MACT). EPA identified 188 hazardous air pollutants for which MACT is required. EPA has taken the approach to implement this program through source categories. For example, they have developed MACT standards for dry cleaners, gasoline distribution, oil and natural gas production, wood furniture manufacturing, etc. The South Dakota air quality program has adopted the federal MACT regulations by reference as they are promulgated and if they are applicable to sources in South Dakota. The Air Quality Program adopts the federal regulations by reference in ARSD 74:36:08. The state rules reference the federal citations (40 CFR 63).

This function involves the regulations to minimize air toxicity. The air quality program does onsite inspections of the regulated facilities. The DENR air quality program performs inspection at about 750 different businesses under the MACT program.

Workers who deal with emissions regulated by the MACT standards must take periodic training. Training and certification requirements cover many types of business activities, ranging from boiler operations to chemical plants to manufacturing using metal plating.

Asbestos Abatement: The Asbestos Program is responsible for regulating asbestos abatement projects in the state of South Dakota. For this reason, guidelines for renovation and demolition projects have been developed. In addition, the department has specific requirements for the handling of asbestos containing materials such as floor tile and roofing materials. The emission standards for asbestos during remodeling or demolition projects are adopted from the federal standards in Administrative Rules of South Dakota 74:36:08. These federal standards are found in 40 CFR Part 61 and 62. Training and certification rules are found in Administrative Rules of South Dakota 74:31.

This function does not include permitting. The DENR waste management program provides technical assistance, issues worker certifications, receives abatement job notices, conducts inspections and handles complaint investigations. They conduct on-site inspections to make sure the work is being done according to regulations. In many cases, asbestos abatement is part of the remodeling process for older government buildings or private businesses. The department has special requirements for the handling of asbestos-containing materials, such as floor tile and roofing material. Waste management program staff make sure contractors who perform asbestos abatement are certified. The department has regulations concerning training and certification. The DENR works with 12 contractor/consultants who perform asbestos abatement in the state.

Open Burning: As part of the air quality program and waste management program, the DENR deals with the open burning of solid waste and vegetative material such as trees, leaves, agricultural crop burning and prescribed fires to manage ecosystems. The statutory authority (34A-1-18) gives the Board of Minerals and Environment the authority to establish open burning requirements and indicate that nonconformance is a violation of the law. The Board

of Minerals and Environment, for the purpose of controlling pollution, shall by rules promulgated pursuant to chapter 1-26 establish emission control requirements and reasonable requirements for open burning. The requirements may vary from area to area, as may be appropriate to facilitate accomplishment of the purposes of this chapter, and in order to take necessary or desirable account of varying local conditions. Any general prohibition against all open burning shall be determined by each municipality or by each county for areas outside the boundaries of the municipalities. The board may not adopt any rule generally prohibiting all open burning, but any board rule regulating open burning shall be only as is necessary to address a specific problem. Any person who allows an emission which does not conform to a requirement in force pursuant to this section is subject to §34A-1-39.

The department, through the Board of Minerals and Environment, adopted solid waste rules (ARSD 74:27:13:11) prohibiting the open burning of solid waste at municipal landfills. In addition, the department adopted air quality regulations to address the open burning of waste materials that are not taken to a landfill from both rural and urban communities. The department made an effort to develop rules that would address air quality issues related to public health, but with enough flexibility to allow open burning of certain items that will not affect public health.

The air quality rules (ARSD 74:36:06:07) prohibit the open burning of materials that generate hazardous air pollutants that have the potential to cause serious health problems. These rules were adopted by the Board of Minerals and Environment. These materials include oils, railroad ties, coated electrical wire, rubber, tires, tar paper, asphalt shingles and wood products treated with inorganic arsenicals, pentachlorophenol or creosols. Open burning of these materials was prohibited because an open flame does not attain a high enough temperature to destroy the chemicals, thus causing a potential for toxic chemicals to be contained in the smoke.

The air quality program and the waste management program also deal with the open burning of solid waste and prescribed fires to manage ecosystems. This function does not include permitting. The air quality and waste management staff mainly deal with complaints about open burning and provide information about open burning regulations, primarily to individuals. They do not work directly with any businesses who conduct open burning in the state; air quality staff contact is mainly with individuals requesting information about open burning.

Radon Testing and Mitigation: The federal Environmental Protection Agency (EPA) has recommended acceptable levels of radon exposure. These levels were based on both health and economics. Both passive and active tests are acceptable methods of testing. The DENR air quality program provides information on radon testing and mitigation in homes. Air quality program information indicates where the highest radon potential exists in South Dakota and the United States. Information provided tells how to obtain and use a radon test kit. Radon level samples are sent to the state health laboratory. The air quality staff help inform homeowners on different methods of mitigating high levels of radon. The air quality people also provide a list of certified radon mitigation professions for South Dakota. The DENR air quality program maintains a list of residential measurement service providers who are certified by the National Radon Safety Board (NRSB). The air quality program provides training related to radon testing and mitigation. The DENR air quality program works with 15 testing and mitigation contractors/consultants under the Radon Testing and Mitigation program.

Medical Waste Disposal: The Air Quality Program developed requirements (ARSD 74:35) for air emissions from incinerators burning medical waste and for the disposal of medical waste. The state regulations indicate requirements for air emissions from incinerators burning medical waste and for the disposal of medical waste. However, the federal regulations that DENR adopted take precedent.

Clean Diesel Grant Program: The South Dakota Clean Diesel Grant Program provides funds that allow school districts to purchase new public school buses to replace old, high-emitting public school buses, and to equip in-use diesel school buses with exhaust control retrofit devices that significantly reduce toxic soot emissions. The primary goal of the program is to reduce school children's exposure to both fine particulate and smog-forming pollution. The DENR provides the grant funding and administers the program.

The Air Quality program awards funding to replace the oldest buses first. The total award per school district is a minimum of 25 percent of the replacement bus cost and may be more, depending upon the number of successful applicants. The program staff gives preference to the school districts that are also applying for exhaust control retrofit installation on their buses. The school districts are not charged for exhaust control retrofits.

For retrofits of new engines in school buses, the DENR air quality program hires a consultant who does the work on-site. In the case of newly purchased school buses, most of the buses come from out-of-state manufacturing plants. This function does not include permitting. The DENR provided grants to 42 public school districts under the Clean Diesel program.

Staffing Issues Related to Air Quality Regulations

Businesses Operating in the Regulated Environment

Many types of businesses have activities impacted by air quality regulations or programs. In some cases, all businesses in an industry sector are covered by the regulations. (Use the DENR website to determine if a specific type of business activity is covered by the regulations.) In other cases, the businesses in an industry sector will be impacted only when they perform a specific regulated activity. The following types of businesses and activities are impacted by the air quality regulations: utility plants, cement plants, asphalt plants, rock crushers, ethanol plants, oil and natural gas production, soybean processing plants, gasoline distribution, wood product manufacturing, grain elevators, spray painting operations, boiler and incinerator operations, drycleaners, asbestos abatement, hazardous and nonhazardous waste disposal, building demolition, radon testing and mitigation, ambient air quality testing, environmental engineering services, and environmental consulting services. Examples of the industry sectors containing businesses that perform the listed activities are exhibited in Appendix A.

Staffing of Businesses Operating in the Regulated Environment

Businesses operating in the regulated environment employ a diverse group of employees; some of these employees work in jobs directly related to the environmental regulations, and some do not. During the interviews with DENR staff, they identified the types of workers with whom they deal directly. Those types of workers are listed by occupational title in Appendix B.

In addition, there are the other employees who work in "green jobs" but might not interact with DENR staff. The SD Department of Labor recently completed a separate survey of "green jobs" in the state. Of particular relevance for this report would be "green jobs" in the

industries that are impacted by environmental regulations. Those other "green jobs" are listed by occupational title and DENR program in Appendix C.

Factors Impacting Staffing in the Regulated Environment

Air quality DENR staff were not aware of any employee shortages/training issues that caused problems for the private firms or public entities in meeting environmental rules and regulations. Air quality staff were not aware of current or developing technology that will affect staffing for firms performing work in the regulated environment.

With respect to new or revised regulations that might affect staffing for firms performing work in the regulated environment, DENR air quality staff mentioned the new greenhouse gas tailoring rule. The EPA announced a final rule on June 3, 2010 to require large power plants and other "stationary sources" of greenhouse-gas (GHG) emissions to get additional Clean Air Act permits. The "tailoring" rule will be phased in. It first will take effect for some facilities in January 2011. It would subject only facilities with GHG emissions of 100,000 tons or more per year to Clean Air Act state permitting requirements. Sources with lower GHG emissions would be exempt. DENR staff thought this new regulation would require additional training of workers at firms, but did not think it would result in any major training or work problems. The air quality staff said the new greenhouse gas tailoring rule would require current staff to learn about the new regulations. But again, they thought it could be handled with current staff, and no additional staff would be needed.



Drinking Water Quality Regulations and Programs

The state of South Dakota began primary enforcement of the federal Safe Drinking Water Act (SDWA) in 1983. The South Dakota Drinking Water Program develops and enforces the South Dakota Drinking Water Regulations that apply to public water systems. Approximately 660 public water systems (PWS) currently exist in South Dakota.

Federal Safe Drinking Water Act

On August 6, 1996, President Clinton signed the federal SDWA Amendments of 1996. The 1996 amendments emphasize sound science and risk-based standard setting, small water supply system flexibility and technical assistance, source water protection, consumer

awareness/right-to-know and water system infrastructure assistance through a Drinking Water State Revolving Fund.

South Dakota adopts the federal regulations through a process of incorporation by reference. The federal regulations being incorporated include 40 C.F.R. PART 141 – National Primary Drinking Water Regulations and 40 C.F.R. PART 142 – National Primary Drinking Water Regulations Implementation.

South Dakota Drinking Water Laws and Rules: Drinking water quality is regulated by SDCL Chapter 34A-3A, Safe Drinking Water and by ARSD Chapter 74:04:12, Drinking Water Standards.

South Dakota Drinking Water Systems: The DENR drinking water program is revising applicable sections of the ARSD to coincide with current federal requirements of the SDWA. New rules added to the drinking water standards include the Ground Water Rule (GWR), Stage 2 Disinfection Byproduct Requirements (Stage 2 DBP) and Long Term 2 Enhanced Surface Water Treatment Rule (LT2). Additionally, minor revisions to the Lead and Copper Rule, as well as updating the references to the most recently published code of federal regulations, are being proposed.

To accomplish the objectives of these administrative rule revisions, two separate rule making processes are being done concurrently. The changes proposed for ARSD 74:04:12, Drinking Water Standards, are addressed in SDCL 34A-3A-3 and are promulgated through the authority of the Water Management Board. The changes in the Drinking Water Standards also require minor revisions to ARSD 74:04:11, Sanitary Surveys and ARSD 74:04:12:41-45, Consumer Confidence Reports. These two rules are addressed in SDCL 34A-3A-25 and are promulgated through the authority of the Secretary of the DENR.

The DENR drinking water program implements the federal safe drinking water act. They were delegated responsibility for regulations and standards for all public drinking water. There are three types of public drinking water facilities: (1) community water systems, (2) non-transient, non-community water systems and (3) transient, non-community water systems. A community water system is a public water system which serves at least 15 service connections, used by year-round residents or regularly serving at least 25 year-round residents. This category would include city water systems, rural water systems and grouped residential water systems. There are 454 community water systems. A non-transient, non-community (NTNC) water system is a public water system that is not a community water system and regularly serves at least 25 of the same persons at such places as work places, offices, daycares and schools for at least six months a year. There are 28 non-transient, non-community water systems. A transient, non-community water system serves different individuals each day (such as a restaurant, motel, tourist attraction or highway rest area); there are 172 in the state.

No permits are required for public drinking water systems. However, a public water system is required to have a certified operator. All new community and non-transient, non-community water systems constructed after October 1, 1999 have to obtain a Certificate of Approval from the DENR before beginning operation. The requirement affects all new water systems. This includes private water systems that do not meet the definition of community or non-transient, non-community water system at start-up, but are designed to one day meet that definition. For example, a developer plots out 30 lots for homes in the development, but when the water system begins operation, there are only four homes hooked up to the

system. Obviously, the intent is for this water system to, one day, be large enough to qualify as a public water system; therefore, the developer must meet all the new water system requirements.

The new requirements include a capacity development review process. The public water system operator has to provide technical, management and financial information. This information would include engineering details and specifications, an operational maintenance plan, water rates, revenue flows, information about management, etc. This new process gives the water system operator a better chance of achieving compliance with safe drinking water rules. The new requirements also give DENR the authority to prevent new water systems that lack technical, managerial and financial capacity from operating. The DENR wanted to minimize a problem that became a concern when the housing market dropped, and real estate developers walked away from some projects.

When working with a new water system in a new residential area, the drinking water quality staff would deal with a wide range of contact people, including real estate developers and their engineers, bank loan officers, residents, realtors, etc. When dealing with public water systems, staff would work with certified operators, public works directors, county planners, city planners, community planners and city engineers.

Drinking water regulations require public drinking water systems to test their water. The tests have to be analyzed by a certified drinking water laboratory. The community water systems have the highest amount and greatest frequency of sampling. Water at non-transient, non-community systems is tested less. The transient water systems have less sampling on a less frequent interval than the other two systems. The water tests are made to determine if there are contaminants which may be a risk to the public. The EPA regulations require testing for about 90 contaminants. The contaminants fall into four groups: microbial pathogens, organics (chemicals), inorgranics and radioactive elements. The risk could be classified as an acute risk, which basically means there could be an immediate impact if the water is drank. The risk could also be classified as a chronic risk, which means it could take a long time to take effect. Normally chemicals fall in this category.

The DENR receives about 96,000 test reports. About 75,000 of these reports are tests conducted by the water system operators. Some of the water system operators send their samples to testing labs. Subsequently, the testing labs submit around 21,000 of the water test reports to the DENR. The drinking water staff verifies the water tests against national contaminant standards. They determine if the drinking water systems are in compliance.

The drinking water systems must also be aware of the possibility of disinfection by-products in the drinking water. Disinfection by-products form when chlorine reacts with natural organic materials in the water. (Chlorine is added to drinking water to reduce the chance of serious illness or death from waterborne diseases.) The Stage I Disinfection By-Product Rule (DBPR) was the first of a staged set of rules that will reduce the allowable levels of DBPs in drinking water. The disinfection bi-product rule establishes seven new standards and a treatment technique of enhanced coagulation or enhanced softening to further reduce disinfection bi-product exposure. These rules affect only drinking water systems that disinfect their water or distribute disinfected water.

Another possible source of public drinking water contamination is fecal contamination from groundwater sources. An EPA regulation called the Ground Water Rule (GWR) was developed

to provide for increased protection against fecal contamination in public water systems that use groundwater sources. This regulation also affects systems that do not have their own sources but are served by other groundwater systems. The GWR establishes a risk-targeted approach for groundwater systems that may be susceptible to fecal contamination. The occurrence of fecal indicators in a drinking water supply is an indication of the potential presence of microbial pathogens (disease causing organisms) that may pose a threat to public health. This rule requires groundwater systems that are at risk of fecal contamination to take corrective action to reduce possible cases of illnesses due to exposure to microbial pathogens. This rule includes community and non-community systems that use groundwater sources. Groundwater sources include wells, springs, (infiltration) galleries and any other water sources that are not regulated under the Surface Water Treatment Rule.

In addition to the water testing, DENR drinking water staff conducts on-site inspections once every three years. Staff inspects the technical parts (physical structures and processes, etc.), the managerial parts (recordkeeping, staffing, etc.) and the financial parts of the operation (water rates, revenues, water usage, accounting for lost water, etc.).

Every public drinking water system must have a certified drinking water system operator. In most cases, the operator is an employee of the business/public entity operating the drinking water system. In the case of the smaller transient, non-community water systems, the certified operator may be the owner of the business; or the transient water system owner may contract for those services. The DENR drinking water quality program provides training for drinking water and wastewater treatment plant operators. There are 1,300 certified water and/or wastewater treatment plant operators.

Federal Drinking Water Compliance Reports: The DENR drinking water program submits data to EPA on a quarterly basis. Data submitted includes: public water system inventory statistics, drinking water standard violations, major monitoring/reporting violations, treatment technique violations and enforcement actions taken against violators. The annual compliance report South Dakota is required to submit to EPA provides a summary of the numbers of violations for: a) drinking water standards, b) treatment techniques, c) variances and exemptions and d) significant monitoring violations. The information is based on data retrieved from EPA and verified against the state's database.

South Dakota's Drinking Water Report: The state of South Dakota prepares an Annual Drinking Water Report for all community public water systems throughout the state. The U.S. Environmental Protection Agency (EPA) requires water suppliers to put annual drinking water quality reports into the hands of their customers. These consumer confidence reports, which EPA developed in consultation with water suppliers, environmental groups and the states, will enable Americans to make practical, knowledgeable decisions about their health and their environment. If the community public water system has had no violations for the previous year and is not served by another water system, the community water systems can use the report generated by the state to distribute to their customers.

Public Notice of a Public Drinking Water Problem: If a water system serves at least 15 service connections or 25 people daily for at least 60 days out of the year, it is a public water system (PWS), and public notification will be required for violations of the State Drinking Water Standards. Specific requirements will differ somewhat depending on whether the system is a community public water system or a non-community public water system.

Public notification helps to ensure consumers will always know if there has been a violation of drinking water quality regulations. The level of public notice is dependent upon the risk associated with the problem. If the problem presents a critical risk to the public, the public notice has to be a Tier 1 notice. Public notice immediately alerts consumers if there is a serious problem with their drinking water. For instance, the presence of fecal materials requires the boiling of water for drinking. If the risk is a chronic risk, a Tier 2 public notice is called for. If the maximum contaminant level was exceeded, the operator must provide public notice indicating the drinking water facility's progress in solving the problem. For less serious problems (e.g., a missed water test), water suppliers must notify consumers in a timely manner.

Drinking Water Security: Drinking water utilities today find themselves facing new responsibilities. While their mission has always been to deliver a dependable and safe supply of water to their customers, the challenges inherent in achieving that mission have expanded to include security and counter-terrorism. The Public Health Security and Bioterrorism Preparedness and Response Act of 2002 recognized the need for drinking water systems to undertake a more comprehensive view of water safety and security. The Act specifies actions community water systems and the U.S. Environmental Protection Agency (EPA) must take to improve the security of the nation's drinking water infrastructure.

South Dakota's Water/Wastewater Agency Response Network (WARN) is a water/wastewater system member organization created to provide mutual aid and assistance to members. The WARN is not a state program. It is a means of receiving help from and giving help to neighboring water/wastewater utilities when responding to and/or recovering from an emergency. This is a tool member utilities can use when the inevitable flood, ice storm, blizzard, fire or even a human-caused event occurs. While everyone hopes these never occur, WARN is an insurance policy in case they do occur and a utility needs assistance in response and recovery activities. The WARN speeds up the ability of the drinking water/wastewater system to respond in an emergency. The emergency can range from a flood impacting drinking water treatment to a small town drinking water plant operator getting the flu. In both cases, the water system impacted can get help from other WARN members. Drinking water security is funded by the water security grant fund. The WARN charges a fee for water/wastewater systems to belong to the organization.

Other public water safety programs: The DENR drinking water quality program regulates public drinking water systems that put fluoride in their water. Community public water systems with over 500 customers require monthly sampling. Only community public water systems serving more than 500 people are required by state law to adjust fluoride levels between 0.9 and 1.7 milligrams per liter (mg/L). If the community water system serves less than 500 people and tests show levels less than the 2.0 mg/L, the water system needs to do nothing about fluoride. If the fluoride level moves above 2.0 mg/L, the water system must work with the drinking water staff to determine what action must be taken to reduce the levels. If the fluoride levels rise above 4.0 mg/L, the water system is in violation of the maximum contaminant level and must give public notice and take corrective action.

The Drinking Water Program is involved in inspecting and monitoring bottled water purveyors operating bottling plants within the state of South Dakota, although the Department of Public Safety provides the actual regulations. All statutory authority rests with the Department of Public Safety. Bottled water must conform to Chapter 20:01:11 of the South Dakota Administrative Rules and to the requirements of CFR Title 21 of the U.S. Food and Drug Administration that relate to bottled water.

The Drinking Water Quality staff is responsible for the safety of public beaches, which includes weekly monitoring fecal coliform bacteria. Compliance is determined based on standards outlined in the state rules. Owners'/operators' staff conducts the actual sampling and visual inspection of the beaches. However, the sampling reports are sent to the Drinking Water staff to determine compliance.

Municipal swimming pools in South Dakota (not including hotel/motel, apartment or campground pools) are required to sample for coliform bacteria during each week of operation. (These other public swimming pools are regulated by the South Dakota Department of Health.) All pool samples are tested for "total coliform," which is an indicator bacteria for drinking water and pools. Two or more consecutive positive samples indicate a general trend of bacteria presence in the pool. Corrective measures should be taken, such as superchlorination, to prevent a health related incident caused by poor water quality. Plans and specifications for municipal swimming pools are required to be submitted to the DENR for review and approval.

New Domestic Well Testing: In order to assure the citizens of South Dakota are provided with a good quality water supply, the Centennial Environmental Protection Act of 1989 requires that all new domestic wells drilled in South Dakota are tested for bacteria and several selected chemicals. The test results, which provide a general indication of water quality, are to be used by residents to judge for themselves the general quality of the water. All compliance samples have to be sent to a lab certified by the DENR.

Drinking Water State Revolving Fund (DWSRF): The Drinking Water State Revolving Fund (DWSRF) Program was established to provide low interest loans for drinking water projects. A capacity assurance checklist is part of the drinking water project assistance application. The Safe Drinking Water Act requires that a system applying for a DWSRF loan must demonstrate it has financial, managerial and technical capacity.

Public Drinking Water System Operator Certification: Drinking water treatment systems protect public health and the environment only if they are working and being operated correctly. The Operator Certification Program is intended to protect public health, environmental quality and water systems' investments in their facilities. There are certifications in water treatment, water distribution, small water treatment systems and very small water systems. All community and non-transient, non-community systems must have a certified water treatment and distribution operator. All transient water systems using surface water or using disinfection equipment, or serving more than 500 people per day, must have a certified operator.

There are 1,300 certified drinking water system operators in the state. The certification process includes training and testing. The DENR contracts with the South Dakota Association of Rural Water Systems to conduct the field training on rules and regulations. They also offer training on the actual operation of a drinking water system for different levels of operation. The DENR conducts the certification exams. The certification exams are supplied by the Association of Boards of Certification (ABC). ABC is a national organization that promotes the certification of water and wastewater professionals. The DENR tracks the different types of water treatment system operators. They can revoke certification for operators who do not meet certification guidelines.

Drinking Water Laboratory Certification: All drinking water compliance samples have to be sent to a lab certified by the DENR. To be certified by the DENR, the lab must follow certain standards, including split samples with blind testing, appropriate equipment and qualified staff. The South Dakota Department of Health audits the testing labs. The DENR publishes a list of laboratories certified for the analysis of drinking water in the state of South Dakota.

Staffing Related to Drinking Water Quality

Businesses Operating in the Regulated Environment

Many types of businesses have activities impacted by drinking water quality regulations or programs. In some cases, all businesses in an industry sector are covered by the regulations. (Use the DENR website to determine if a specific type of business activity is covered by the regulations.) In other cases, the businesses in an industry sector will be impacted only when they perform a specific regulated activity. The following types of businesses and activities are impacted by the drinking water quality regulations: public drinking water systems, water bottling plants, municipal swimming pools, water line construction, environmental engineering services, water testing laboratories, environmental consulting services and government agencies. Examples of industry sectors containing businesses that perform the listed activities are exhibited in Appendix A.

Staffing of Businesses Operating in the Regulated Environment

Businesses operating in the regulated environment employ a diverse group of employees; some of these employees work in jobs directly related to the environmental regulations, and some do not. During the interviews with DENR staff, they identified the types of workers with whom they deal directly. Those types of workers are listed by occupational title in Appendix B.

In addition, there are the other employees who work in “green jobs” but might not interact with DENR staff. The SD Department of Labor recently completed a separate survey of “green jobs” in the state. Of particular relevance for this report would be “green jobs” in the industries that are impacted by environmental regulations. Those other “green jobs” are listed by occupational title and DENR program in Appendix C.

Factors Impacting Staffing in the Regulated Environment

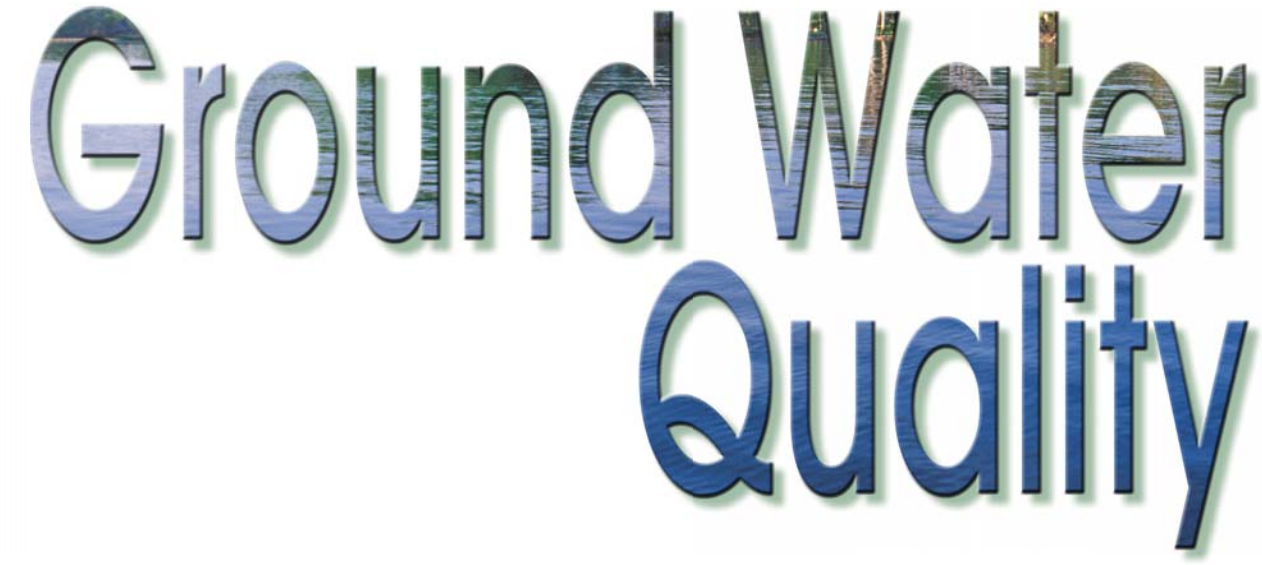
Although it has never reached the level of a staffing crisis, DENR drinking water quality staff noted a lack of certified operators for the private water systems. Staffing problems also happen when the small town municipal water system operators move on to better paying jobs in larger cities. Because they cannot find certified operators locally, some smaller towns have begun contracting for these services.

There are new water filtration techniques that may affect staff training, but probably not staffing levels. A new membrane filtration treatment is being used to produce cleaner drinking water. The membrane filtration treatment may help remove arsenic and radium from drinking water and other contaminants that are by-products of the water softening process.

The national primary drinking water regulations outline acceptable levels of regulated contaminants in drinking water. There is an ongoing revision of those regulated contaminants. In addition, the Unregulated Contaminant Monitoring Regulations call for public water systems to monitor for potential contaminants that are not regulated by national primary drinking water regulations. These regulations include monitoring for pesticide, herbicide and perchlorate levels. State regulatory agencies are required to write new contaminant regulations,

using a more holistic approach. These new regulations will probably not create any South Dakota jobs, but they will require additional sampling by drinking water quality staff.

Although new or revised regulations will probably impact training and time needed for studying new regulations and standards, additional DENR staff will not be required. The drinking water quality staff has been able to handle additional workload because of efficiencies in tracking.



Ground Water Quality Regulations and Programs

The Ground Water Quality Program is responsible for managing South Dakota's ground water resources. This includes the cleanup of all spills and Superfund projects, regulating above-ground and underground storage tanks, overseeing the SARA Title III program, issuing ground water discharge permits, implementing an Underground Injection Control program, and helping protect the ground water resources through the source water assessment and protection program.

South Dakota Ground Water Quality Laws and Rules: Ground Water Quality is regulated by South Dakota Codified Laws Chapter 34A-2, Water Pollution Control; Chapter 34A-10, Remedies for Protection of Environment; Chapter 34A-12, Regulated Substance Discharges; and Chapter 34A-17, Uniform Environmental Covenants Act. In addition, ground water quality is covered by South Dakota Administrative Rules Chapter 74:34:01, Regulated Substance List and Reporting of Discharges; Chapter 74:54:01, Groundwater Quality Standards; Chapter 74:54:02, Groundwater Discharge Permits; Chapter 74:10:09, Enhanced Recovery and Underground Injection; Article 74:55, Underground Injection; and Article 74:56, Storage Facilities—Remediation.

Groundwater Discharge Permits: In 1989, the South Dakota Legislature declared groundwater is a resource of immeasurable value (SDCL 34A-2-104) to public health and welfare, and that pollution of South Dakota's ground water constitutes a menace to public health, welfare and environment. It was also determined that once groundwater is polluted, it is extremely difficult and expensive to clean up, so both enforcement and public education are necessary to minimize releases of pollutants. In order to maintain and improve groundwater quality for

present and future beneficial uses, the state implemented a groundwater protection strategy that promotes pollution prevention, the correction of existing groundwater pollution, and close control of limited degradation for necessary economic and social development.

Permits allow public entities and businesses to discharge pollutants to groundwater. The permits allow the groundwater to be degraded to a certain level within a certain distance of the source of the discharge. Almost all the DENR groundwater standards are the same as the drinking water standards. There are many types of businesses and public entities which may discharge pollutants to groundwater, i.e. mines, feed lots, cities (wastewater treatment facilities), etc. The permits are fairly complex and must have a detailed description of the specific geology and hydrology of an area. The DENR works with 13 groundwater discharge permit holders. The permit holder has to sample groundwater on a periodic basis during the year.

The ground water program conducts annual inspections of the site of the groundwater discharge. They may also take water samples to check the groundwater quality. DENR staff normally work with the manager of the facility for private businesses or the wastewater treatment plant operator for municipal facilities. There are no ground water requirements for which ground water discharge operators have to be certified, and there are no DENR ground water required training courses. However, ground water staff conduct training for new permit holders, i.e. feedlots. They show the facility workers how to take the water samples. The samples are sent to certified labs. The labs are not certified by the ground water program staff, but they use only labs that have already been certified by the drinking water program.

Public Water Supply System Assessment and Protection: Most drinking water systems in South Dakota depend on ground water for their source of drinking water. Other public drinking water systems depend on surface water supplies, such as lakes and streams, for drinking water. In both instances, it is likely the drinking water system is using that source because it is the most reliable, high-quality source of water available. Therefore, to protect the future of the state, it is important to protect water supplies from potential contaminant sources.

The federal 1996 Safe Drinking Water Act Amendments directed each state to initiate a program focusing on protecting the area surrounding a public drinking water supply. These Amendments required each state to identify existing and potential pollution sources that may impact the quality of public drinking water supplies. The DENR coordinated this effort in South Dakota.

The DENR provides groundwater assessment and protection through two programs, the Wellhead Protection Program and the Source Water Assessment and Protection Program. The Wellhead Protection Program allows local units of government to protect groundwater public water supply systems through the use of state laws and regulations and local ordinances. The Source Water Assessment and Protection Program works to protect both groundwater and surface water public water supply systems.

Under the Source Water Assessment and Protection Program, DENR determines the areas contributing water to public drinking water supplies. They also determine what potential contaminant sources exist in the watershed that could potentially contaminate the water supply. The department completed a source water assessment of each of the approximately 760 public water supply systems in South Dakota. If a new well is drilled, the DENR reevaluates the boundaries which identify the area contributing water to the drinking water supplies.

Under the Wellhead Protection Program, DENR works with local governments as part of a voluntary program to protect areas where groundwater is a source of drinking water. Under South Dakota law, the local governments can write ordinances to limit or exclude certain sources of pollution. These ordinances require public hearings, and DENR staff act as a public resource at these hearings.

The South Dakota Association of Rural Water Systems works with local communities to develop plans to protect ground water. They also provide training on related topics. The East Dakota Water Development District provides ground water technical assistance to counties in their district.

The Wellhead Protection and Source Water Assessment and Protection Programs do not require any certifications, nor do they require specific training courses. However, water treatment plant operators must be certified by the DENR's drinking water program.

Underground Injection Control Permits: The Federal Safe Drinking Water Act protects all sources of drinking water, including underground sources (aquifers). The underground injection control program regulates any injection into the subsurface through six classes of wells. Administrative Rule of South Dakota 74:55:01 contains regulations for Class III wells, and Administrative Rule of South Dakota 74:55:02 covers Class I, IV and V. At this time, South Dakota has no rules addressing Class VI wells. Class II wells are the only wells for which South Dakota has had primary enforcement authority delegated by EPA. Class III wells require a permit from both EPA and South Dakota. All other classes of wells are currently regulated by EPA. The Underground Injection Control Program of the Federal Safe Drinking Act is found in 40 CFR Parts 144-147.

Class I and Class IV injection wells are used for the disposal of hazardous, nonhazardous, radioactive, municipal and some industrial wastes, and wastewater. Class IV wells are banned nationally, and both types of wells are banned in South Dakota. Class II injection wells are used for the disposal of wastes generated in the production of oil and gas, or for the injection of materials to enhance the recovery of hydrocarbons. Class III wells are used to inject materials for the purpose of extracting minerals such as sulfur, salts and uranium. Class VI wells are used for the injection of carbon dioxide at geologic sequestration facilities. All other types of injection wells are included in Class V. Typical Class V wells in South Dakota include geothermal return wells, domestic wastewater disposal wells (septic systems), septic systems and sumps used in various types of industrial/commercial businesses, and wells used in groundwater remediation projects.

In South Dakota, the DENR ground water quality program regulates Class II injection wells. Class II injection wells are used in the oil fields in Harding and Fall River counties to get rid of waste materials from oil and gas productions. In addition, materials are injected into the ground to stimulate the oil to flow to the production well.

Class III injection wells are regulated by both federal and state law in South Dakota. The Class III wells are incidental to mining. The groundwater program works with the minerals and mining program to make sure ground water quality is protected. There are currently no operational Class III wells in South Dakota. However, PowerTech USA is proposing to use Class III wells to inject fluids in the groundwater to dissolve the uranium and make it easier to recover. The owner must make sure the chemicals and uranium do not impact adjacent underground

sources of drinking water. Obtaining a permit for Class III injection wells is a complicated process.

TransCanada Pipeline: Ground water quality staff worked with the TransCanada Pipeline to make sure the pipeline did not cross any drinking water well heads or source water protection areas. They have also worked with the company to plan for any oil spills.

Reporting Releases/Spills of Hazardous Materials Which May Impact Groundwater: Spills which may have a potential impact on groundwater must be reported. When gasoline, pesticides, solvents or other substances are spilled or released, there is a potential surface water, groundwater or human health may be threatened. The South Dakota Regulated Substance Program was established to identify what substances and quantities of substances need to be reported, when they should be reported, and to ensure a spill or release is contained or remediated as quickly as possible. The statutes which may apply to a release or spill can be found in SDCL Chapter 34A-12, and the regulations are in the ARSD Chapter 74:34. A release or spill of a regulated substance (including petroleum and petroleum products) must be reported to DENR immediately if certain conditions exist.

Spills can be discovered in many different ways. The spill could be caused by a truck accident, plane crash or leaking petroleum tank and be reported right after the spill occurs. In other cases, the spill might not be discovered until a prospective buyer finds contamination on a property. An important part in the process of dealing with a spill is to determine the responsible party. In some cases, the responsible person is unknown. Or the responsible person may not have the funds to pay for the clean-up process. Then state funds are used to pay for the clean-up and remediation.

All spills must be reported to the groundwater program. If a responsible party cannot be identified or is not financially viable after the spill is reported, the groundwater quality program staff arrange for an environmental contractor to assess and contain the spill. If the spill is a hazardous material, completion of this step might require the wearing of protective clothing. Next, an environmental contractor (probably the same one doing the assessment) would clean up the spill. Then sampling and monitoring need to take place to make sure there are no remaining problems that will affect public health. If necessary, additional work to remediate the groundwater takes place. The ground water quality program handles around 9,000 cases of reported spills.

The ground water quality program standards require environmental contractors to have 40 hours of hazardous materials training. If it is a petroleum spill, workers must be certified as petroleum remediators by the South Dakota Board of Technical Professions.

Above-ground and Underground Petroleum Storage Tanks: Spills or releases from petroleum storage tanks can contaminate groundwater, surface water and soil. To protect against those spills, there are regulations for certain classes of underground tanks and above-ground tanks. With regard to the underground tanks, this is a federal program where EPA has given the state primacy. The state also has a program which provides funds to reimburse costs associated with the assessment and clean-up of contamination caused by releases from petroleum tanks. The program is administered by the Petroleum Release Compensation Fund (PRCF). The regulation of aboveground storage tanks is not part of a federal program.

In 1998, requirements for spill and corrosion protection for regulated underground storage tanks (USTs) became effective. Businesses had to make the following changes to remain

in compliance with the regulations: upgrade the UST by adding spill, overfill and corrosion protection, *or* replace it with a new UST that has spill, overfill and corrosion protection, *or* properly close the old UST. The new protection program significantly lowered the number of spills or releases from underground tanks.

The storage tank regulations require new storage facilities to provide plans and specifications to the DENR for approval. They must also register all tanks with the ground water program. There are 4,129 aboveground tanks and 2,965 underground tanks registered. Ground water staff conduct inspections of the underground storage tank facilities about once every two years. By August 2012 all regulated underground storage tank facility owners/managers will have to attend a department-approved training program on the proper operation and maintenance of underground storage tank systems. While this training is required under the department's rules, the PRCF will negotiate a contract with an outside vendor to provide the training.

Abandoned Petroleum Tank Removal Project: One way to help protect human health and the environment, particularly groundwater, from the threats posed by many older underground storage tanks is to remove the tanks. The 2000 Legislature authorized a voluntary abandoned underground storage tank removal project. The bill authorizes the DENR to remove tanks that qualify and the Petroleum Release Compensation Fund (PRCF) to pay for the removal and any necessary environmental cleanup. If those abandoned tanks targeted in the bill remain in the ground, petroleum releases will eventually occur. The following types of tanks were eligible: abandoned petroleum and waste oil tanks located at gas stations or commercial motor fuel vendors that closed before April 1, 1988; abandoned waste oil tanks located at commercial motor fuel vendors or noncommercial operations; or abandoned petroleum tanks located at noncommercial operations. So this program included oil and petroleum tanks located at commercial businesses, old farm tanks on farms and ranches, and old heating oil tanks at private residences.

One of the first steps in removing an abandoned tank is an assessment. In some cases, DENR ground water staff do the assessment. In other cases, the DENR hires a contractor to assess the situation. Then DENR hires contractors to remove the tank(s). The work is paid for by funds from the PRCF. Since the program began, DENR has authorized the removal of 4,172 abandoned tanks. The ground water program does not require certification for the contractors who do the assessment or the tank removal. However, individuals doing the environmental sampling must be certified.

Ground Water Brownfield Program: Every city and county, in both rural and urban areas, has abandoned, underutilized and potentially contaminated properties. The Ground Water Quality Program currently has programs available to assist with the redevelopment of brownfields. Brownfields are real property for which expansion, redevelopment or reuse may be complicated by the presence or potential presence of a hazardous substance, pollutant or contaminant. Often the potential liability associated with contamination complicates business development, property transactions or expansion on the property. By investigating and cleaning up a brownfield property and taking care of the site's possible health or environmental risks, communities can use local land again, producing jobs, increasing the tax base or adding other benefits such as creating a park or residential area. For example, the "Phillips to the Falls" project in Sioux Falls was a brownfield project where an old railroad switching yard, scrap metal salvage operation and brickyard area with lead contamination near the river was cleaned up for future use as a "green area" by city residents and visitors. Another example

would be the brownfield project in Gary where the closed School for the Blind was renovated. The building had asbestos and lead paint problems, but brownfield funds allowed it to be converted to a community center.

In some cases, the assessment and clean-up of these potentially polluted or contaminated areas is paid for by the responsible party. If there is no known viable responsible party, federal funds are used by the ground water program to hire contractors to assess and clean up the brownfield areas. The groundwater regulations do not require the contractors doing the assessment and clean-up to be certified, unless there is a specialty removal problem (i.e. hazardous materials). The contractors need to be certified to remove hazardous materials.

EPA CERCLA (Superfund) Sites in South Dakota: The Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), commonly known as Superfund, was enacted by Congress on December 11, 1980. This law created a tax on the chemical and petroleum industries and provided broad federal authority to respond directly to releases or threatened releases of hazardous substances that may endanger public health or the environment. The Superfund legislation established prohibitions and requirements concerning closed and abandoned hazardous waste sites, provided for liability of persons responsible for releases of hazardous waste at these sites, and established a trust fund to provide for clean-up when no responsible party could be identified.

The law authorizes two kinds of response actions: short-term removals, where actions may be taken to address releases or threatened releases requiring prompt response, and long-term remedial response actions, which permanently and significantly reduce the dangers associated with releases or threats of releases of hazardous substances that are serious, but not immediately life threatening. The long-term actions can be conducted only at sites listed on EPA's National Priorities List (NPL).

Superfund is a federal program which allows state participation. The SD DENR Ground Water Quality Program works with the federal staff. This program can be implemented with or without a viable responsible party. (If there is a viable responsible party, that party usually hires contractors to clean up the hazardous waste at the site.) Only federal contractors can be used on these projects if the project is a fund lead site or the responsible party is the federal government. EPA normally hires a large national general contractor for these projects. Depending upon the scope of the project, the general contractor hires sub-contractors to handle different parts of the work. Contractors are needed both for the assessment and removal of hazardous materials.

There are two sites in South Dakota currently on the NPL, Ellsworth AFB and Gilt Edge Mine. Work at Ellsworth Air Force Base will be paid for by the Department of Defense. Contractors have been hired for assessment and remediation. Work at the Gilt Edge Mine (Brohm) work is being paid for by federal and state funds, since the owner went bankrupt. EPA pays for 90 percent of the costs, and the state pays 10 percent. EPA is lead agency on the project with DENR as the support agency. Ultimately, the State of South Dakota will be responsible for the operation and maintenance of the site after EPA completes the project.

SARA Title III (Emergency Planning and Community Right to Know Act): After a major chemical plant disaster in Bhopal, India and a chemical release in Virginia raised concerns about chemical emergencies, federal, state and local governments became concerned about their ability to deal with a chemical disaster. In the United States, planning for and responding to

chemical accidents became mandatory for all levels of government. States passed laws giving workers and citizens the right to access information about hazardous substances in their communities. In 1986 Congress passed the Superfund Amendments Reauthorization Act (SARA). SARA contains three subtitles, but most of the regulations involving general Local Emergency Planning Committee (LEPC) activities fall under SARA Title III. Title III of SARA is also known as the Emergency Planning and Community Right-to-Know Act (EPCRA). The interchangeable use of EPCRA and SARA, Title III often leads to confusion, but they are the same.

Many of the voluntary programs and state laws became federal law with the passage of EPCRA. The law requires that detailed information about the nature of hazardous substances in or near communities be made available to the public. It provides stiff penalties for companies that **do not** comply and also allows citizens the right to file lawsuits against companies and government agencies to force them to comply. EPCRA also requires each state to establish a State Emergency Response Commission (SERC) to deal with hazardous materials issues at state levels. The SERCs in turn are required to establish LEPCs.

This is basically a federal program, but the federal government provides no funds to the states. All businesses or public entities who use, store or spill any chemicals on their facility must submit an annual report; there are 1,667 businesses or public entities making reports in South Dakota. In addition, certain large facilities must submit annual reports detailing permitted and non-permitted waste disposal, recycling, reuse and treatment.

The ground water program works with the Local Emergency Planning Committees in areas where these chemical facilities are located. Local Emergency Planning Committees (LEPCs) learn about chemical hazards in the community, develop emergency plans in case of an accidental release and look for ways to prevent chemical accidents.

DENR charges these chemical facilities a fee based on the amount and types of chemicals involved. The funds collected are used to pay for DENR staff who work on these projects and are also distributed to LEPCs who request assistance. DENR provides funds to 36 LEPCs.

The contact person with whom the ground water program works varies by the size of the establishment. It can vary from the owner of a small business to the environment and safety officer at a large company like 3M. Ground water program rules do not require workers at these chemical facilities to be certified. However, DENR puts on workshops for regulated facilities.

Ground Water Contamination Response Funds: When the DENR discovers a source of pollution that may contaminate ground water and no viable responsible person is found, the DENR uses various fund sources that match the type and scope of the problem. There are four potential sources of funds: Abandoned Underground Storage Tank funds, Brownfield funds, Leaking Underground Storage Tank trust funds, and Regulated Substance Response Funds.

The state of South Dakota recently adopted a work plan to identify proposed annual Brownfield projects to be funded through the Brownfield Revolving Loan Subfund and Brownfield Assessment and Cleanup Subfund and amounts available to fund such projects. The department does, however, have limited funding for the Assessment and Cleanup Subfund. These funds will be used by the department to hire contractors to perform assessment and cleanup work on eligible Brownfield sites. The work plan provides a list of projects and the work that is being performed on each project by the department. In addition, the department may supplement Brownfield Assessment and Cleanup funds with other available

funds such as Leaking Underground Storage Tank (LUST) Trust Funds and other appropriate funds. The department estimates $300,000 in LUST Trust funds will be used through the Assessment and Cleanup Subfund on LUST eligible activities at Brownfield sites in 2010. These funds will be used to assess and cleanup petroleum contaminated properties that meet the requirements of both the Brownfield Program and the Leaking Underground Storage Tank Program.

The Regulated Substance Response Funds are the fund of last resort. When the situation does not work for any of the other response funds, this one is used. Environment and settlement fees go into this fund. This fund source is most often used when an emergency occurs and a viable responsible person cannot be found.

The same types of contractors are hired to assess and clean-up the contaminants. Basically, DENR has some contractors on retainer who can quickly act to solve these problems.

Staffing Issues Related to Ground Water Quality

Businesses Operating in the Regulated Environment

Many types of businesses have activities impacted by ground water quality regulations or programs. In some cases, all businesses in an industry sector are covered by the regulations. (Use the DENR website to determine if a specific type of business activity is covered by the regulations.) In other cases, the businesses in an industry sector will be impacted only when they perform a specific regulated activity. The following types of businesses and activities are impacted by the ground water quality regulations: mining, feedlots, wastewater treatment facilities, oil and gas production and exploration, uranium exploration and production, septic system installation, petroleum storage, hazardous waste removal, contractors cleaning up contaminated property, abandoned petroleum tank removal, environmental engineering services, environmental consulting services, ground water analysis and government agencies. Examples of the industry sectors containing businesses that perform the listed activities are exhibited in Appendix A.

Staffing of Businesses Operating in the Regulated Environment

Businesses operating in the regulated environment employ a diverse group of employees; some of these employees work in jobs directly related to the environmental regulations, and some do not. During the interviews with DENR staff, they identified the types of workers with whom they deal directly. Those types of workers are listed by occupational title in Appendix B.

In addition, there are the other employees who work in “green jobs” but might not interact with DENR staff. The SD Department of Labor recently completed a separate survey of “green jobs” in the state. Of particular relevance for this report would be “green jobs” in the industries that are impacted by environmental regulations. Those other “green jobs” are listed by occupational title and DENR program in Appendix C.

Factors Impacting Staffing in the Regulated Environment

No major staffing or training issues were noted by DENR staff. However, it is often difficult to find hydrologists for the safe removal of storage tanks. No new technology impacts were noted by DENR ground water quality staff.

There will be new federal regulations that require storage tank owners to take training. EPA is also considering a new class of injection well that allows increased recovery of oil in depleted

or high viscosity oil fields through a technique called carbon sequestration through enhanced oil recovery. Carbon dioxide is injected into the ground. The oil and carbon dioxide mix, and the oil moves more easily to the production well. EPA is currently developing regulations.

Although the newly required training for storage tank owners will affect staff workload, it will probably not require more DENR staff. Also, new injection well regulations should not affect staffing.

Surface Water Quality Regulations and Programs



The primary responsibilities of the Surface Water Quality Program are to regulate (permit) and monitor point source discharges of pollutants; to establish surface water quality standards; and to conduct routine monitoring of surface water quality to ensure the state's streams and lakes are protected.

South Dakota Surface Water Quality Laws and Rules: The Administrative Rules of South Dakota (ARSD 74:51:01, :02, and :03) contain South Dakota's surface water quality standards. Chapter 74:51:01 contains both the numeric and narrative criteria assigned to the beneficial uses of the state's water bodies. Chapters 74:51:02 and 74:51:03 designate the beneficial uses assigned to lakes and streams in the state.

Note: South Dakota Codified Law 34a-2 – Water Pollution Control Act is the umbrella statute for all surface water quality regulatory authority. Administrative Rules of South Dakota implemented under that statute are:

ARSD 74:51 Surface Water Quality

ARSD 74:52 Surface Water Discharge Permits

ARSD 74:53 Water Supply and Treatment Systems

Surface Water Discharge Permitting Program: In 1972, Congress passed the federal Clean Water Act. Under this act, the National Pollutant Discharge Elimination System (NPDES) permitting program was established to help protect the quality of the nation's waters. The stated

goal of the act was to restore and maintain the chemical, physical and biological integrity of the nation's waters. To achieve this goal, the Clean Water Act states the discharge of any pollutant by any person shall be unlawful except in compliance with other provisions of the statute. On December 30, 1993, EPA delegated the authority for issuing NPDES permits in South Dakota to the state. In South Dakota, those permits are referred to as Surface Water Discharge permits.

Point source discharges of pollutants are required to obtain a state-issued Surface Water Discharge permit. The permits contain effluent limits to protect the beneficial uses of the state's surface waters. The permits also contain the sampling and reporting requirements that each facility must follow.

In addition to the permitting process, DENR staff conducts on-site inspections and enforces the regulations if violations occur. They deal mainly with municipal waste-water facilities. However, permits are also issued to private industries such as ethanol plants. During the permitting process, inspections and enforcement actions, DENR staff may work with a consultant/contractor regarding design, construction and operation issues. These consultants are normally engineers. The primary contact for the on-site inspections is the wastewater treatment plant operator or public works director. If there are violations, DENR staff may deal with mayors and city councils for violations at municipal facilities, corporate environmental directors for private-sector wastewater facilities, and/or consulting engineers for either type of facility.

State law requires the plans and specifications for "works of sanitary significance" be designed by a professional engineer registered in South Dakota. In accordance with this law, plans and specifications for wastewater treatment facilities must be submitted to DENR. DENR staff reviews and approves the plans for any new or upgraded wastewater treatment facilities.

There are approximately 400 surface water discharge permits in both the private and public sectors in South Dakota.

Pretreatment/Industrial Discharge into Sanitary Sewers Permit: EPA developed the Pretreatment Program as part of the NPDES program. South Dakota was delegated the authority for the Pretreatment Program on December 30, 1993. The Pretreatment Program regulates industrial discharges into sanitary sewers. The goal of this program is to prevent industrial discharges from impacting the wastewater treatment system or passing through the treatment system into the environment. The program is also designed to protect the safety of the treatment plant workers and ensure the bio-solids left over after treatment can be safely disposed of or reused.

DENR staff conduct permitting, inspections and oversight functions for private industries within a municipality that discharges industrial waste into the sanitary sewer. The process for small cities and large cities is quite different. For smaller cities, DENR staff writes permits, conducts on-site inspections, and enforces the regulations if violations occur. Larger municipalities have their own pretreatment permitting process and regulations. Those larger municipalities also conduct inspections and enforcement if violations occur. DENR staff provides over-sight inspections of these municipal pretreatment programs and ensures the municipality is implementing the pretreatment program in accordance with state and federal law.

During the on-site inspections, DENR staff works with either an environmental coordinator (mainly for larger firms) or the firm's wastewater treatment plant operator. The primary contact for compliance issues is with the firm's management team. DENR staff works with municipal public works directors, engineers and/or attorneys on oversight issues.

As noted above for the surface water discharge permit program, state law requires the plans and specifications for the "works of sanitary significance" to be designed by a professional engineer registered in South Dakota. The plans and specifications for new or upgraded wastewater systems to pretreat industrial wastewater must be submitted to DENR. DENR staff reviews and approves the plans for these wastewater treatment facilities. There are 34 businesses with pretreatment permits and 23 firms with bio-solids permits.

Storm Water Permits: As noted above, Congress passed the Federal Water Pollution Control Act, commonly referred to as the Clean Water Act, in 1972. As part of the NPDES permitting program, the Clean Water Act requires a program for addressing the pollution caused by storm water runoff. These regulations recognize that runoff from rainfall and snowfall can pick up pollutants that may end up in the storm sewer and eventually in surface water.

South Dakota has developed "general permits" to provide a simple process for permitting these discharges. A general permit allows a streamlined method for permitting large numbers of discharges. DENR developed general permits that outline the requirements that must be followed state-wide. Dischargers then submit a notice of intent to comply with the conditions of the general permits.

There are two types of storm water discharges currently covered by general permits in South Dakota: construction site runoff and industrial site runoff. The storm water general permit for construction site runoff is required for construction sites that are larger than one acre of disturbed soil. The project owner files a notice of intent, and DENR then issues coverage under the general permit.

Industries with outside storage of materials or equipment are required to obtain permit coverage under the industrial storm water general permit from DENR. For example, animal processing plants are required to get industrial storm water permits. Mining firms are also required to get storm water general permits. The firm seeking a permit files a notice of intent, and DENR issues permit coverage.

The regulatory functions include permitting, inspections and enforcement. Normally, DENR staff work with the construction site manager or landowner for the construction storm water permits. In some cases, the construction firm has an environmental person who works with DENR. The South Dakota Department of Transportation has the largest number of construction storm water permits and has an environmental staff that works with DENR on construction storm water issues and permitting requirements. For the industrial permits, DENR staff works with an industry's or mine's environmental director or directly with the owner when the firm is a small company. DENR handles approximately 2,300 storm water permits, but the numbers change daily.

Concentrated Animal Feeding Operations (CAFO) General Permit: In South Dakota, concentrated animal feeding operations are regulated by a General Water Pollution Control Permit. One of the permit requirements is that producers submit the engineering plans and specifications for their manure management system. The plans and specifications for their system

must meet Department of Environment and Natural Resources design requirements, must be stamped by a South Dakota registered professional engineer and must be approved by a department engineer.

The feeding operations include beef feedlots, large dairies, poultry production facilities and swine confinement operations. All concentrated animal feeding operations have to get coverage under the general permit. A producer may also need to get coverage under the general permit if required to do so by a local level of government, or if a DENR inspection finds the operation is causing water pollution, which makes the operation a CAFO. The permit application has to include plans and specifications for the manure management system, a nutrient management plan, and operation and maintenance guidelines. The DENR functions include reviewing the plans and specifications for the manure containment system and the nutrient management plan, issuing approval of the application, issuing coverage under the general permit, conducting construction inspections and operation and maintenance complaint inspections, and pursuing enforcement.

DENR staff work with the design engineer for the manure containment plan and crop consultants who develop the nutrient management plan. DENR conducts periodic inspections during the construction phase, and normally work with the construction site manager, the contractor and the operator. After the construction is completed, DENR staff meet with the feedlot or farm operator during inspections and about enforcement issues. DENR also works with local conservation district staff and the USDA Natural Resources Conservation Service staff to make sure the feeding operations are consistent with federal guidelines if required. The department has issued permit coverage to 400 CAFOs.

Biosolids/Sludge Management Permit: When wastewater is treated, there is often a solid residual remaining, called sludge or biosolids, that must be treated and managed in a manner that protects both human health and the environment. Congress directed EPA to develop a comprehensive national Sewage Sludge Program aimed at reducing risks and maximizing the beneficial uses of municipal biosolids. In February 1993, EPA issued its sewage sludge use and disposal regulation, found in Title 40 of the Code of Federal Regulations (CFR) Part 503, commonly referred to as the "503s." As part of EPA's implementation for the 503s, it has developed a permitting program for biosolids to ensure biosolids are beneficially reused or disposed of in an environmentally safe manner. In 1998, EPA delegated this permitting program to DENR. DENR issues permits that detail the requirements for each facility's specific biosolids management program.

DENR staff works with municipal wastewater treatment plant operators, public works directors, environmental coordinators and consultants. There are 23 biosolids permits in South Dakota.

Water Treatment and Distribution Treatment Plant Permit: On January 30, 2009, the department released a notice to issue a General Surface Water Discharge Permit for Water Treatment and Distribution Activities. The water treatment plant general permit is designed for drinking water systems that have discharges from the normal operation of water treatment and distribution. This includes overflows from treatment and storage systems, filter backwash and settling basins, disinfection and flushing of potable water lines, storage system disinfection, and water line breaks and leak repairs. These discharges can be troublesome since chlorine used to disinfect the drinking water is toxic to fish.

These discharges are normally temporary in nature, but can be quite frequent. The permits are needed by municipal and rural water treatment systems during the treatment and distribution of drinking water. DENR's Surface Water Quality staff work with the water treatment plant operator or the public utilities director during the on-site inspection.

This general permit is relatively new. Currently, DENR has about 60 facilities covered under this permit, with the number increasing weekly.

Section 401 Water Quality Certification Projects: Section 401 of the federal Clean Water Act requires states to review projects requiring a federally issued license or permit to ensure the project will not impact the stream quality or violate a state's Surface Water Quality Standards. The DENR conducts this review in South Dakota and issues a 401 Water Quality Certification. Any applicant for a federal license or permit to conduct any activity including, but not limited to, the construction or operation of facilities which may result in any discharge into navigable waters, requires a Section 401 certification.

DENR staff deal with the federal permitting staff at the federal agency issuing the permit or license. Normally, the applicant is an individual or a public entity like a city, and DENR staff may work with that individual or representative of the public entity while reviewing the application.

Total Maximum Daily Loads (TMDLs): Section 303(d) of the federal Clean Water Act requires states to develop an Impaired Water Bodies list. Impaired water bodies are those for which the water quality does not support its designated beneficial uses. To determine the causes of the impairment, DENR is required to develop Total Maximum Daily Loads (TMDLs) for the impaired water bodies. TMDLs are calculations to determine the allowable pollutant load a water body can receive and still meet the applicable water quality standards. The calculation must include contributions from all point and nonpoint sources, as well as natural sources, and have a margin of safety to ensure the water body meets its designated beneficial uses.

TMDLs must be developed for water bodies that do not meet the water quality standards or might not meet water quality standards with the application of technology-based controls for point sources. In these cases, point sources of pollution would need additional water quality-based controls. Once a state has developed a TMDL, it is required to post a public notice about the TMDL and have it approved by EPA.

DENR staff work with local, state and federal agencies and organizations to assess watersheds for impaired water bodies and develop implementation projects. Implementation projects often recommend adoption of the best management practices for each watershed.

Whole Effluent Toxicity Testing: Whole Effluent Toxicity (WET) refers to the aggregate toxic effect to aquatic organisms from all pollutants contained in a facility's wastewater (effluent). It is one way to implement the Clean Water Act's prohibition of the discharge of toxic pollutants in toxic amounts. Whole Effluent Toxicity (WET) tests measure wastewater's effects on specific test organisms' ability to survive, grow and reproduce.

WET testing uses fathead minnows and *Ceriodaphnia dubia* to measure if a discharge is or may be toxic. The test can be either acute or chronic. Acute tests are short-term tests, usually 96 hours or less. The acute test determines if the effluent would be lethal to aquatic life and measures whether the fathead minnows and *Ceriodaphnia* live or die.

Chronic tests are longer-term tests. The test is typically run for up to seven days. The fathead minnow test measures whether the discharge affects the growth rate of the minnow. The *Ceriodaphnia dubia* test measures whether the discharge effects the reproduction of the *Ceriodaphnia*. The chronic test also measures if the effluent is lethal to aquatic life.

WET testing is required for larger municipal and industrial wastewater discharges. The permit holder must sample the wastewater discharge to determine if sensitive aquatic life would be harmed. DENR staff work with an environmental coordinator, wastewater treatment plant operator or public works director for the discharging facility and, at times, someone involved with the lab testing. DENR has required WET testing in 46 permits.

Surface Water Quality Monitoring Network: The DENR maintains a surface water quality monitoring network of South Dakota's streams. There are currently 151 active ambient surface water quality monitoring stations across the state. The data from these sampling stations help the Department identify problems, document improvements and demonstrate overall trends in the quality of South Dakota waters. DENR surface water quality samplers are located in Rapid City, Vermillion, Watertown and Pierre.

Water Body Restoration Enhancement: Projects designed to enhance or restore the water quality, habitat, fish life propagation uses and recreational uses of a water body are encouraged and promoted by various state and federal agencies. All such projects must be approved in advance by the DENR.

These projects occur when individuals wish to eliminate unpleasant or unwanted plant life or fish species from a water body. Projects usually involve a chemical treatment to the water body. This is normally a short-term, one-time treatment. The project requires public notice of the treatment, inviting public comments. DENR staff normally work with the South Dakota Game, Fish and Parks Department. An example of a project is where a farmer might try to control black bird predation on sunflower fields by eliminating cattails that the birds use for nest sites in wetlands. DENR staff also work with the South Dakota Department of Agriculture, which is the state agency responsible for regulating the use of pesticides. The individual who applies the chemical must be certified.

Clean Water Act Section 319 Program: Section 319 of the federal Clean Water Act (CWA) is a non-regulatory program that provides grants to states to reduce water pollution from nonpoint sources, such as polluted runoff from urban, agricultural and forest lands. The primary nonpoint source pollutants in South Dakota are sediment, phosphorus, nitrogen and bacteria.

In South Dakota, Section 319 funds are used for the restoration and maintenance of the beneficial uses of the state's water resources impaired by nonpoint source pollution. Project proposals can be submitted in one of three general categories – watershed, ground water, or information and education. Priority will be given to projects that develop or implement total maximum daily loads (TMDL) on a watershed basis. Eligible applicants include governmental agencies and subdivisions, such as conservation districts, water development districts, counties and municipalities; universities; certain nonprofit organizations; and federally recognized Indian Tribes. Other groups may participate by applying through one of the eligible entities as a project partner.

The funds support a wide variety of activities, including implementation of Best Management Practices, technical assistance, education, training, technology transfer, demonstration

projects and monitoring to assess the success of specific nonpoint source implementation projects.

Domestic Septage Land Application and Disposal Guidance: Domestic septage is defined as any liquid or solid material removed from a septic tank, cesspool, portable toilet, Type III marine sanitation device or any similar systems that receives only domestic (non-commercial) septage. Grease trap residues, grit and screenings, and any domestic septage that is combined with commercial or industrial wastes are not considered domestic septage and are regulated by the department's Waste Management Program.

Domestic septage is typically disposed of in two different ways in South Dakota. The first option is to take the material to a municipal or private wastewater treatment facility where it can be properly treated. The second option is to beneficially reuse the material by land application at non-public contact sites. A non-public contact site is an area where the potential for public exposure is minimal, such as agricultural fields, forests or mining reclamation sites.

Domestic On-site Wastewater Treatment Systems: On-site wastewater treatment is regulated by DENR regulations. Because South Dakota is a rural state, approximately 25 percent of the residents rely on onsite wastewater systems to provide their wastewater treatment needs. These systems typically consist of a septic tank and a drainfield. Wastewater treatment in isolated areas can be an issue, especially in areas near surface water. The domestic wastewater treatment regulations outline the design requirements for a domestic wastewater treatment system and require the installation of the system to be completed by a certified septic tank installer. The DENR certifies septic tank installers in the state. Plans and specifications for all systems which receive human wastewater, other than systems consisting of a septic tank followed by an absorption system like a drainfield, and systems requesting a variance from DENR's regulations must be approved by a department engineer prior to construction.

On-Site Assistance for Wastewater Operators: DENR has a program to provide on-site technical assistance to wastewater operators. This program is not a permitting or regulatory function of the DENR. This program targets new operators who need hands-on assistance and facilities having difficulty meeting their Surface Water Discharge permit requirements. Technical assistance is a big part of the DENR's role in environmental protection. Surface Water Quality staff want to help waste-water treatment plant operators maintain compliance. This program includes many small city wastewater operators. The assistance is provided primarily in those cases where there have been compliance issues.

Water and Wastewater Operator Training and Certification: State law requires that water and wastewater plant operators be certified by the state. The Operator Certification Program is intended to protect public health, environmental quality and water/wastewater systems' investment in their facilities. Depending upon the size and population of the city, different levels of certification are required. There are certifications in water treatment, water distribution, wastewater treatment, wastewater collection, stabilization ponds and small water treatment systems. Some levels of certification may require a college degree and some years of experience.

The DENR currently contracts with the South Dakota Rural Water Association to provide technical training to water and wastewater operators. In addition, the DENR works with the South Dakota Water and Wastewater Association, which provides continuing education in the

form of two conferences or seminars each year. DENR staff conduct the operator testing. The actual certification comes from the South Dakota Board of Operator Certification.

Staffing Issues Related to Surface Water Quality

Businesses Operating in the Regulated Environment

Many types of businesses have activities impacted by surface water quality regulations or programs. In some cases, all businesses in an industry sector are covered by the regulations. (Use the DENR website to determine if a specific type of business activity is covered by the regulations.) In other cases, the businesses in an industry sector will be impacted only when they perform a specific regulated activity. The following types of businesses and activities are impacted by the surface water quality regulations: municipal wastewater facilities, feedlots, mining, oil and gas production and exploration, building and highway construction contractors, animal processing plants, soybean processors, ethanol plants, grease trap cleaning, solid waste landfills, solid waste collection, septic system installation, site preparation contractors, chemical pest control, environmental engineering services, environmental consulting services, ground water analysis, and government agencies. Examples of the industry sectors containing businesses that perform the listed activities are exhibited in Appendix A.

Staffing of Businesses Operating in the Regulated Environment

Businesses operating in the regulated environment employ a diverse group of employees; some of these employees work in jobs directly related to the environmental regulations, and some do not. During the interviews with DENR staff, they identified the types of workers with whom they deal directly. Those types of workers are listed by occupational title in Appendix B.

In addition, there are the other employees who work in “green jobs” but might not interact with DENR staff. The SD Department of Labor recently completed a separate survey of “green jobs” in the state. Of particular relevance for this report would be “green jobs” in the industries that are impacted by environmental regulations. Those other “green jobs” are listed by occupational title and DENR program in Appendix C.

Factors Impacting Staffing in the Regulated Environment

There is an ongoing problem related to finding qualified staff to operate wastewater lagoons. It is difficult for smaller towns to maintain certified staff. As towns grow, regulations require a higher level of certification, and it can be difficult to find staff with the required level of certification. Also, when a small business decides to build outside the city limits, it may not have staff with the knowledge to deal with the wastewater treatment requirements.

Chemical manufacturers continue to develop safer chemicals which require smaller amounts per treatment. There is a need for chemical applicators with the specific training to safely make spot treatments of these new chemicals.

There are going to be new Concentrated Animal Feeding Operations (CAFO) regulations that are more restrictive for the application of manure. This will greatly impact smaller feeding operations. There is an environmental need for more efficient manure land application. EPA will be trying to limit nutrients, especially Nitrogen and Phosphorus land application. This will potentially be a problem for wastewater facilities that use a mechanical treatment process, and will probably increase the demand for engineers.

Although there has not been a lot of turnover in staff, it is sometimes difficult to attract workers with certain skill sets (i.e. engineers) to Pierre, South Dakota, when the economy is strong. There will be new regulations that may not affect staffing levels but will most likely require additional training. New regulations regarding the use of pesticides in or near water bodies will tax staff at times.

New regulations will change the water quality standards regarding nutrient levels. This will affect both CAFOs and wastewater facilities that use a mechanical treatment. There are approximately 14,000 small to medium sized feeding operations which will probably be impacted by new regulations. Attaining these new nutrient levels will be very expensive. It will be a real challenge for DENR staff to regulate and still allow this part of the agriculture community to remain a viable part of the economy.

Minerals and Mining (including Oil and Gas) Regulations and Programs



The Minerals and Mining Program is the regulatory arm of the DENR responsible for ensuring the impacts from mineral exploration, mining, oil and gas production to the environment are minimized and that affected lands are reclaimed and useable after the resources have been extracted. The regulatory process includes issuing exploration permits, mine permits, mine licenses, and oil and gas permits in accordance with the requirements of state law and rules, and then inspecting and monitoring development activities to ensure compliance with permit requirements.

South Dakota Minerals and Mining Laws and Rules: The Oil and Gas Conservation Statute (Chapter 45-9) requires the Board of Minerals and Environment and the DENR to promote the development of oil and gas resources in the state in a manner that will prevent waste, encourage the greatest economic recovery of oil and gas, and protect correlative rights, ground water resources, the environment and human health.

Exploration for all minerals excluding uranium is regulated by the South Dakota Mineral Exploration Act (SDCL 45-6C) and the South Dakota Plugging Standards (ARSD 74:11:08).

Exploration for uranium is controlled by the South Dakota Uranium Exploration Act (SDCL 45-6D) and the South Dakota Plugging Standards (ARSD 74:11:08). Drilling for oil and gas is regulated under SDCL 45-9 and the Administrative Rules of South Dakota (ARSD) Article 74:09 and 74:10. In addition, underground injection for the purpose of enhanced oil recovery or the disposal of exploration and production wastes is regulated by the same statute and rules. Mining for sand, gravel, rock, crushed and used in construction; pegmatite minerals and limestone; iron ore; sand, gypsum or shale used to make cement or lime; or dredging for commercial resale is handled by mine licenses issued under SDCL 45-6. Mining of all other minerals including gold, silver, uranium, precious metals, coal, bentonite and dimension stone requires a state mine permit issued under SDCL 45-6B and ARSD 74:29.

Minerals and Mining (except Oil and Gas) Exploration: Exploration involves mining companies looking for minerals. The minerals exploration usually involves drilling or trenching. Exploration permits are required for exploration of all minerals such as gold and silver, precious metals, uranium, and oil and gas seismic shot-holes. The permit is required to include a reclamation plan, an operations plan and maps of the area. A permit is not required for activities that cause little or no surface disturbance. There are 30 active exploration permits.

After the minerals and mining staff receive the permit application, they conduct a pre-inspection of the proposed exploration area. This inspection may be in conjunction with other state agencies. Those agencies include the South Dakota Game, Fish and Parks Department, the State Archeologist, local conservation districts and the U.S. Forest Service (if the site is on Forest Service land). (The local conservation districts provide advice on seeding the area when it is reclaimed.) DENR minerals and mining engineers and hydrologists conduct a technical review of the permit. The minerals and mining staff provide a restriction letter to the mining company which issues the permit and identifies environment concerns. The mining company is required to submit a reclamation bond prior to the granting of the exploration permit.

The mining companies range in size from large national companies to small sole-proprietorships. When working with the large mining companies, DENR mineral and mining program staff deal with professionals in the exploration field, including engineers, permitting specialists, attorneys, etc. Some of the smaller businesses may involve just one person with a back hoe and a truck digging a trench to locate spots for conducting placer mining for gold. In those cases, mineral and mining staff would work with the business owner.

Most mining companies hire a drilling contractor to do that part of the work. The mining companies may hire local contractors to do other parts of the work, i.e. grass seeding, etc. There is no requirement for certification or licensing for the mine operators or the mining exploration workers.

Mining (except Oil and Gas): Mine permits are required for the extraction and processing of minerals such as gold, silver, uranium, precious metals, coal, bentonite and dimension stone. Mine permits are issued under the South Dakota Mined Land Reclamation Act (SDCL 45-6B) and the South Dakota Mined Land Reclamation Rules (ARSD 74:29). In situ leach mines are also required to comply with ARSD 74:29:11. Crusher permits are issued under ARSD 74:36.

There are two types of mine permits—large scale mines and small scale mines. The minerals and mining program has 47 mine permits. There are fewer mining companies than permits

since a mining company might have more than one mining operations in an area. A permit is required for each mining operation.

Large scale mine permits are required for operations that affect more than 10 acres or mine more than 25,000 tons of material per year, or for operations that use cyanide or other biological or chemical leaching agents. The Black Hills gold mining companies would be an example of large scale mines. The large scale mine permits are quite rigorous and require large amounts of technical data. DENR mineral and mining staff review the permit and prepare a recommendation to the Board of Minerals and Environment, which is then public noticed. If anyone intervenes, a public hearing must be held by the Board of Minerals and Environment, which then decides the issue. If the recommendation is not contested, the permit is issued in accordance with the recommendation. For large scale mine permits, the Board of Minerals and Environment sets the reclamation bond to cover the entire cost of hiring a third party contractor to conduct reclamation activities. Operations that employ cyanide leaching or other chemical or biological leaching agents are required to submit additional financial assurance or bonding with the department. Prior to release of the reclamation bond, an operator must submit a bond to cover post-closure costs after the reclamation bond is released. A post-closure plan must also be submitted at the same time.

The large scale mine operator is required to submit an annual report on the anniversary date of the permit (the date when the permit was originally issued). The department mails an annual report form to the mine operator about two months before the anniversary date. The mine operator is required to complete the form and submit it to the department along with an annual fee. Large scale precious metal, coal or uranium mines that were permitted after January 1, 2009 pay a larger fee than those permitted before that date. Large scale gold mines have separate annual reporting requirements and are required to submit annual reports on January 1 of each year.

The minerals and mining staff deal with a wide range of professional staff and consultants when working on large scale mine permits. The mining professionals might include engineers, hydrologists, biologists, etc. The minerals and mining program works with the same state and federal agencies as they do with exploration permits.

Recreational mining, such as gold panning and mineral collecting that uses hand-held equipment such as picks, shovels, gold pans, sluice boxes or metal detectors, is exempt from permit requirements. A mine permit is required for portable dredges or other mechanized equipment, even for use in recreational mining.

Small scale mine permits are issued for operations that fall under the levels required for large scale mines. The small scale mine permits are less rigorous and involve a shorter time frame than the large scale mine permits. For small scale mine permits, the Board of Minerals and Environment sets the reclamation bond to cover reclamation costs up to a maximum of $2,500. The mineral and mining program's primary contacts with the small scale mines would be the mine operator or the owner of the business.

The annual report requirements for a small scale mine permit are similar to those for a large scale mine permit. The department mails an annual report form to the operator about two months before the anniversary date of when the permit was granted. The operator is required to complete the form and submit it to the department along with an annual fee prior

to the anniversary date. The annual fees are much smaller for small scale mines than for large scale mines.

Mine Licenses: A mine license is required to mine sand, gravel, rock to be crushed and used in construction; pegmatite minerals; limestone, iron ore, sand, gypsum or shale used to make cement or lime; or dredging for commercial resale. Landowners who mine sand and gravel for their own personal use and do not sell it are exempt from mine licensing requirements. The law that applies to sand, gravel and construction aggregate mining is SDCL 45-6.

No permit is required to mine sand, gravel and the other materials just noted. The operator just has to follow the environmental guidelines in law for each mine site. The mine operator has to provide public notices of the operation and notify the minerals and mining program, the South Dakota Game, Fish and Parks Department and the State Archeologist.

Prior to the commencement of mining, an operator must submit a reclamation bond based on the acres of affected land. In lieu of submitting a reclamation bond for each operation, an operator may submit a statewide reclamation surety to cover all operations throughout the state. Units of state and local government are exempt from bonding requirements. The minerals and mining program lists approximately 500 mine licenses. About three-quarters of them are held by private operators. The remaining quarter are held by the South Dakota Department of Transportation, county highway departments and municipalities.

The mine owners have to pay an annual mine license fee for each privately-owned mining site authorized under a mine license. The fee has to be paid when the mine submits the annual mine license renewal. There are 1,800 active mine sites.

The operator is required to file an annual report on the annual report date of the mine license set by the department. The department mails an annual report form for each licensed location to the operator about two months before the annual report date. The department also provides a map for each licensed location so the operator can show the areas mined and reclaimed overall since the last annual report date.

For large mine operations, DENR minerals and mining staff work with a professional staff person, i.e. environmental coordinator. The primary contact for the small private mining operations is the owner of the business. For public entities, it is the South Dakota Department of Transportation staff, the county highway superintendent or city official. The minerals and mining program does not require any certification for mine operators or mining workers.

Oil and Gas Drilling: Oil and gas drilling is regulated by the minerals and mining program. Permits for drilling new wells, or deepening or re-entering existing wells require department approval and possibly the submission of a pit liner variance application. The first step in the process is submission of an application for a permit to drill. The drilling permits are reviewed by the geologists in the oil and gas section and granted administratively by the minerals and mining program. The oil and gas operators are required to reach an agreement with the owner of the land surface regarding damages to livestock and surface land resulting from drilling operations.

Minerals and mining oil and gas conservation rules (SDCL 74:10) require a bond for the oil and gas drilling and reclamation operations in the state.

The DENR issued 56 oil and gas drilling permits in 2009 and 23 oil and gas drilling permits in 2010. There are 162 producing oil wells and 98 producing gas wells. All the oil and gas production takes place in Harding County and Fall River County. The minerals and mining staff work with the oil company professional staff and contractors hired by the oil and gas companies. These professionals include geologists, engineers, landmen, drilling contractors, surface reclamation contractors, well logging contractors and soil specialists. The oil and gas rules do not require oil and gas operators, contractors and other service personnel to be licensed or certified.

Uranium Exploration: Uranium exploration permits are required for the exploration of uranium. Activities covered under the permit include sinking shafts, tunneling, drilling test holes, or cuts or other works for the purposes of extracting samples (including bulk samples) to prove the commercial grade of a uranium deposit before commencement of mining operations or development of test facilities.

The uranium exploration permit process is basically the same as for mining. However, in the case of uranium exploration, all permits must go through the public hearing before they are approved. There is currently one permit in the state for uranium exploration which has been issued to Powertech (USA) Inc. for its Dewey/Burdock project in Fall River and Custer counties. Powertech has completed exploration activities under the permit and is currently working on obtaining a large scale mine permit for an in-situ (leach) mine.

The minerals and mining staff deal with the same type of professional staff and consultants at the uranium companies as were noted with large mining companies. Basically, the same group of state and federal agencies discussed with mining is also involved with the uranium exploration.

Abandoned Mined Lands: The DENR regulates the active mining industry, but does not have an abandoned mine reclamation program or adequate funds to reclaim the remaining un-reclaimed inactive and abandoned mine lands (IAM) sites that warrant further cleanup attention. In 1997, the DENR completed an inventory of known inactive and abandoned mined lands in the Black Hills. It identified about 900 hard rock IAM sites within a specified area of Meade, Lawrence, Pennington and Custer counties. Of the approximately 900 inventoried sites, about 200 are located on U.S. Forest Service land and about 700 on private land. In addition to the DENR inventory, an inventory of IAM sites on U.S. Forest Service (USFS) lands was conducted by the USFS and was incorporated into the state's database. In an effort to prioritize the mines on National Forest lands, those sites (about 200) were subjected to a hazard screening for physical and environmental hazards.

About 65 inactive and abandoned mine sites, mostly on private land, have been voluntarily reclaimed by the active mining industry on properties that they own or control. Some of those sites have become part of an active mining operation. A few sites on federal land have been reclaimed by the USFS.

Although abandoned mines are still being reclaimed, the minerals and mining program only works in an advisory role. As part of a national effort to reclaim abandoned mines, DENR identified three IAM sites in Lawrence County as sites the state wanted to see reclaimed -- the Minnesota Ridge Mine, the Belle Eldridge Mine and the Eagle Bird Mine. The DENR

worked with the U.S. Forest Service, EPA and the U.S. Bureau of Land Management in reclaiming the Minnesota Ridge Mine and the Belle Eldridge Mine.

Staffing Issues Related to Minerals and Mining

Businesses Operating in the Regulated Environment

Many types of businesses have activities impacted by minerals and mining regulations or programs. In some cases, all businesses in an industry sector are covered by the regulations. (Use the DENR website to determine if a specific type of business activity is covered by the regulations.) In other cases, the businesses in an industry sector will be impacted only when they perform a specific regulated activity. The following types of businesses and activities are impacted by the minerals and mining regulations: uranium mining and exploration, gold ore mining, bentonite mining, gravel pits, quarries, oil and gas production and exploration, landscaping services, remediation services, environmental engineering services, environmental consulting services, ground water analysis and government agencies. Examples of the industry sectors containing businesses that perform the listed activities are exhibited in Appendix A.

Staffing of Businesses Operating in the Regulated Environment

Businesses operating in the regulated environment employ a diverse group of employees; some of these employees work in jobs directly related to the environmental regulations, and some do not. During the interviews with DENR staff, they identified the types of workers with whom they deal directly. Those types of workers are listed by occupational title in Appendix B.

In addition, there are the other employees who work in "green jobs" but might not interact with DENR staff. The SD Department of Labor recently completed a separate survey of "green jobs" in the state. Of particular relevance for this report would be "green jobs" in the industries that are impacted by environmental regulations. Those other "green jobs" are listed by occupational title and DENR program in Appendix C.

Factors Impacting Staffing in the Regulated Environment

Minerals and mining staff did not note any staffing or training issues that would keep mining companies from meeting minerals and mining regulations. However, the lack of companies which will write reclamation surety bonds was an issue within the minerals and mining program.

New technology in the form of computer applications, geographical information systems and geographical positioning systems have created efficiencies for both the mining companies and the minerals and mining program.

Minerals and mining staff were not aware of any new or revised regulations that would affect DENR staff. They do not implement federal law like the other DENR programs. The minerals and mining staff have been able to use new computer technology to become more efficient. Although the number of mining permits has increased dramatically, staff levels have remained stable.

Waste Management

Waste Management Regulations and Programs

The Waste Management Program is responsible for the department's regulatory efforts in the area of solid waste, hazardous waste, asbestos and polychlorinated biphenyls (PCBs). The office is also responsible for the coordination of the state's solid waste recycling efforts.

Solid Waste staff regulate the disposal of solid wastes such as municipal garbage, tires, yard waste, construction and demolition debris, contaminated soil and sludge. The staff also issue solid waste disposal permits, review and approve plans and specifications, perform inspections of disposal sites and investigate complaints pertaining to the improper disposal of solid waste.

South Dakota Solid Waste Laws and Rules: A solid waste facility, as defined in state law, is any facility acquired, purchased, modified, maintained or operated to facilitate the storage or disposal of solid waste. The statutes are found in SDCL 34A-6, and the rules developed to implement these statutes are found in the ARSD 74:27.

Chapter 34A-6 requires that for the purposes of proper, effective and safe disposal of solid waste, any person intending to dispose of solid waste within South Dakota must comply with the provisions of state law. These provisions require a solid waste permit and establish requirements and procedures for obtaining the permit. In regard to landfill bans, state law (SDCL 34A-6-67) prohibits certain materials from being landfilled, unless it is determined that recycling costs more than disposal.

Solid Waste Facilities: Individuals, government entities, businesses and industries are required to obtain a permit only if they own or operate a solid waste facility. Farmers and ranchers are allowed to dispose of their wastes on their own land without a permit under the following conditions: 1) if the domestic waste is generated on their property; 2) if the disposal is not a threat to human health or the environment; and 3) if the disposal does not unduly pollute the air or waters of the state.

The Waste Management Program has developed several "general" permits. A general permit is designed to apply to a variety of similar facilities. The general permit is often more restrictive than a permit written specifically for a particular facility (known as an individual permit), but the process for receiving authorization to operate is streamlined and more efficient. The

SD DENR issues “individual permits” for specific types of waste disposal at specific sites. The individual permits involve a more complex process.

The DENR solid waste program charges fees based on the volume of waste disposed at a landfill. There is an application fee, and an amendment fee can be charged if there is a change in the landfill operation. The initial application is for a two-year period. Then there is a renewal process every five years. The fees go into a fund which helps pay for the staff person who reviews the applications and grant permits.

Permits are required if solid waste is to be stockpiled, buried or spread on the land. After an applicant submits an application, DENR waste management staff review the information on the application for completeness and accuracy.

There are 15 regional landfills, most of which are operated by municipal and county governments. There are another 230 smaller solid waste facilities, ranging from restricted use disposal sites to transfer stations to construction and demolition debris sites. Most of these facilities are operated by small towns. Only a few are privately-owned solid waste facilities.

DENR staff conduct on-site inspections of solid waste facilities. They check the permits and compliance by checking facility operation, determine whether or not materials are being correctly segregated, check the incoming loads and make sure unauthorized waste is not being accepted. Large landfills are inspected twice per year; and smaller disposal sites are checked once every two years. The DENR works with the landfill manager at large landfills. In most small landfills, DENR staff work with the city council or a city worker. Although landfill workers do not have to be certified, DENR encourages them to attend the Managers of Landfill Operations (MOLO) training course offered by the South Dakota Solid Waste Management Association.

Petroleum Contaminated Soil Landfarms: The State of South Dakota has permitted many different facilities within the state to operate as treatment sites for petroleum contaminated soil. A number of the permitted sites are located at Municipal Solid Waste Landfills or Restricted Use Sites. The 15 regional landfills can bury contaminated soil. However, the majority of Petroleum Contaminated Soil Landfarm Facilities are permitted exclusively for treating petroleum contaminated soil. These permits are governed by rules which apply to “general” solid waste permits. There are a total of 24 petroleum contaminated soil landfarms, 12 of which are private businesses.

The DENR reviews the petroleum contaminated soil landfarm application to make sure it meets environmental protection siting criteria and has obtained county approval. In some cases a variance is required, i.e. site is too close to an occupied dwelling. The petroleum-contaminated soil landfarms can be difficult to regulate. Because of that reason, annual reports are required. The solid waste staff works closely with ground water quality staff to regulate landfarms, since ground water quality staff deal with the removal and clean-up of underground petroleum storage tanks.

The DENR does not require certification or training for landfarm operators. However, they do conduct some on-site training during inspections. Facility operations are simple since the permit guidelines tell the operators what to do. For example, the permit guidelines require the soil to be turned. How to accomplish that task is left up to the landfarm operator.

Waste Tires: Waste tires are a regulated solid waste in South Dakota. There are administrative rules that govern the collection, transportation, storage, processing and disposal of waste tires. ARSD Chapter 74:27:22 Collection, Transportation, Storage and Processing of Waste Tires is the source of the waste tire handling regulations.

Specifically, the rules hold waste tire generators, haulers and other handlers responsible for ensuring all waste tires are transported to a permitted facility or used appropriately. The rules contain requirements governing stockpiling and/or temporary storage of waste tires. The rules clearly state when a permit for temporary storage is required. Amended waste tire rules require anyone burying or partially burying tire wastes to first secure a solid waste permit.

Permits are required for anyone who processes waste tires, but mainly for landfills. The landfills normally just store the tires until they can be picked up by a tire processing company. New Deal Tire of Groton is the only tire processing business in the state and has a tire handling permit. The tire processing permit holder is required to have financial assurance, because of the concern about stored tires just being left when a business closes.

DENR staff conduct on-site inspections of the New Deal Tire facilities. They also check retail sites that sell tires to determine where their waste tires are going. Inventories of the large construction and mining tires are becoming a problem for regulators, since the stock piles are not now being used as quickly by businesses that make stock water tanks and feeders out of them. In the future, firms maintaining large stock piles of these tires will be regulated. The department does not require certification or training for waste tire handlers.

Yard Waste Compost: In 1995 the State of South Dakota enacted a plan to reduce the amount of wastes disposed of in landfills. As a part of this plan, yard waste may no longer be taken to a landfill for disposal. Instead of burying yard waste in landfills, composting has become an important way to recycle yard waste.

Facilities that handle solid yard waste compost must have a permit from the DENR. In most cases, this would not be a separate permit, but part of a solid waste permit (or restricted use permit). For example, the city of Yankton has a transfer site permit, a yard compost permit and restricted use permit all accounted for under one solid waste permit.

Almost all the yard compost facilities are public entities, with very few private businesses operating a yard compost site. The DENR conducts on-site inspections of these yard waste compost sites. Operators are not required to have special training or certification. All the important guidelines are noted in the permit.

Waste Open Burning: In South Dakota, the burning of waste is regulated under SDCL 34A-6, SDCL 34A-1-18, ARSD 74:27, and ARSD 74:36. Permitted solid waste disposal sites such as municipal solid waste landfills and restricted use sites may conduct open burning as long as it is performed in compliance with the solid waste permit and within the air quality guidelines for open burning.

The department has to regulate open burning, because some businesses and public entities believe it is much less expensive to burn than to properly dispose of garbage or waste. DENR regulation is also important because open burning emits pollutants into the air. The DENR waste management program does not grant open burning permits. There are 195 sites that have permits to dispose of wastes with specific requirements for the open burning of certain wastes. These sites are allowed to open burn trees, branches and untreated wood only.

About 35 small cities do not have a permitted solid waste disposal site, but are still allowed to open burn trees, branches and untreated wood only. These sites are called permit-excempt sites. These sites are monitored by waste management staff because wastes other than those allowed to be open burned often are illegally dumped and sometimes burned at these sites. There are only a few private firms permitted to dispose or treat wastes. All open burn sites are inspected by DENR staff; even the permit-exempted sites are inspected. Operators of solid waste disposal sites are not required to have training or certification. However, they are required to contact a local government entity before burning, i.e. fire department in a municipality.

Waste Backyard Burning: Backyard burning is a type of open burning common in rural areas. It typically involves the burning of household waste in a burn barrel or open pit. In addition to being a fire hazard, it is a source of dangerous pollutants, including dioxins, particulate matter, lead, mercury and hexachlorobenzene. In recent years, stringent controls have been placed on municipal, medical and hazardous waste incinerators to reduce air pollutants. As a result, backyard burning is now the nation's largest quantified source of dioxins.

The DENR does not require permits for solid waste backyard burning. However, only individuals are allowed to conduct backyard burning subject to local controls; businesses cannot use backyard burning to get rid of waste materials. If they do, the DENR will take action against them. Farmers and ranchers have an exemption from this rule, unless they cause air pollution or water pollution. City and county government have ordinances that may restrict open burning.

Sump Waste Disposal: The mixture of dirt, grime and grit that accumulates in sumps is classified as a solid waste sludge and must be appropriately disposed. The types of waste collected in a sump depend upon the type of business that is using the device. For example, car wash residue and material washed into sumps from the floors of vehicle maintenance shops will differ from waste that is placed in floor sumps at industrial facilities. The State of South Dakota presently does not have rules specific to the handling and disposing of sump pit wastes. Therefore, the solid waste guidelines related to sump waste have been put together to assist waste generators and pumpers in making reasonable, environmentally sound decisions when handling these wastes. In doing this, future liability for such wastes can be minimized.

Based upon experience gained over the years by the Waste Management Program, sump wastes generated by car wash and vehicle maintenance shops are not considered hazardous wastes. An exception to this assumption would be if hazardous waste was placed into the sump for disposal purposes. As a result, unless hazardous waste is known or suspected to be present in the sump, wastes from car wash and vehicle maintenance shops can be considered a solid waste and disposed of in accordance with the DENR guidelines.

Sump wastes generated at industrial facilities will need to be analyzed in order to determine whether the waste would be considered a hazardous waste. Although the burden of proper disposal of sump waste lies with the business that generated the waste, sump pump service companies also carry the responsibility of disposing of the waste at a proper site. These industrial sump waste guidelines do not apply to domestic waste (septic tanks and/or food related grease traps).

The DENR does not require a permit for the disposal of sump waste. However, the "grit" from the sump must be properly disposed off, according to solid waste guidelines. If the "grit" is determined to be hazardous, it must be properly disposed of in accordance to hazardous waste guidelines. In some cases, businesses hire a septic tank pumper to remove the grit. Once water has been used to make the grit pumpable, it cannot be taken to a landfill because the mixture contains "free" liquids. Some firms just hire workers to scoop the solids from the sump pit and then dispose of it as a solid waste. In some parts of western South Dakota, it is difficult to find sites which will take sump waste. For example, the Rapid City regional landfill will not take sump waste.

Recycling: The Recycling Program staff is responsible for providing technical assistance to solid waste planning and waste minimization projects. The DENR has compiled a list of businesses, transfer stations and landfills that offer recycling services. The following types of materials are recycled: paper, cardboard, plastic, antifreeze, batteries, concrete, asphalt, CRTs (cathode ray tubes), electronics, vehicle mercury switches, fluorescent bulbs, mercury, used lumber and building materials, metals, scrap tires, used oil and used oil filters.

The DENR generally does not require businesses recycling sorted normal household and residential garbage to have permits. However, a permit is required if a waste other than normal household and residential garbage is being recycled (e.g. waste tires). Permits are also required if the recycling operation generates incidental waste materials requiring on-site burial or disposal. A solid waste permit might also be required if a recycling operation results in large volumes of recyclable materials being stockpiled for unreasonable periods of time.

South Dakota Hazardous Waste Laws and Regulations: Hazardous waste is regulated by South Dakota Codified Laws Chapter 34A-11 Hazardous Waste Management and Administrative Rule of South Dakota 74:28.

The Hazardous Waste staff enforce the state's hazardous waste rules and regulations. These management standards apply to generators and transporters of hazardous waste, used oil and universal waste. The staff also issue and enforce permitting requirements for hazardous waste treatment, storage and disposal facilities. Hazardous Waste staff provide technical assistance to regulated businesses and to state and local governments to ensure compliance with environmental regulations. Special topics addressed by hazardous waste staff include the management of spent fluorescent bulbs, used oil, electronic waste and clandestine meth labs.

PCB Waste Disposal: South Dakota is the home of five private businesses involved in Polychlorinated Biphenyl (PCB) activities. These operations conduct electrical transformer repair and service, and reclamation of materials extracted from PCB-containing equipment. All PCB-containing oil and ash debris is shipped out of state for proper management and disposal. The DENR's Waste Management Program is responsible for conducting limited inspections of PCB operations, in order to review the business' solid and hazardous waste related activities. Reclamation furnaces utilized by two of the operations have been issued joint solid waste and air quality permits. Regulatory aspects of PCB-related operations are conducted by EPA Region VIII personnel.

Meth Waste Clean-up: On December 21, 2007 the Methamphetamine Remediation Act of 2007 was signed into law. The act required EPA to develop voluntary cleanup guidelines for use by states and local governments to ensure that sites of former meth labs are safe.

Upon completion of a meth lab investigation, trained hazardous waste contractors then carefully identify, package and remove all of the meth lab-related chemicals and equipment. This material is then transported off-site for proper disposal.

The federal Drug Enforcement Agency has contracts with two out-of-state companies to clean-up and transport hazardous meth waste in South Dakota to out-of-state hazardous waste facilities, since there are no hazardous waste facilities in the state. The DENR has little contact with the companies doing the meth waste clean-up. However, these out-of-state hazardous waste facilities must have an ID number so the DENR can track where the meth waste is being transported.

Pharmaceutical Waste Disposal: The state's hazardous waste program regulates the management and disposal of certain pharmaceutical wastes generated by commercial entities (e.g. hospitals, clinics and pharmacies). Unwanted pharmaceuticals generated by households are not regulated under the state's hazardous waste rules; however, the state does recommend residents follow certain disposal practices to ensure these materials do not get taken out of the garbage and misused. Certain drugs, such as narcotics, must be disposed of by both consumers and commercial entities in accordance with federal Drug Enforcement Agency (DEA) requirements. Specific information relating to the management of unwanted pharmaceutical waste, generated by both residents and commercial entities, is provided through the DENR's Waste Management website. Information regarding the management of medical waste (e.g. used syringes, needles, blood-born pathogens) can be found on the Solid Waste Program's webpage.

Asbestos Waste Disposal: The Asbestos Program is responsible for regulating asbestos abatement projects in the State of South Dakota. For this reason, guidelines for renovation and demolition projects have been developed. In addition, the DENR has specific requirements for the handling of asbestos-containing materials, such as floor tile and roofing materials. The emission standards for asbestos during remodeling or demolition projects are adopted from the federal standards in ARSD 74:36:08. These federal standards are found in 40 CFR Part 61 and 62. The waste management program provides technical assistance, issues worker certifications, receives abatement job notifications, conducts inspections and conducts complaint investigations. Training and certification rules are found in ARSD 74:31.

The DENR does not require permits for asbestos abatement. However asbestos abatement firms must notify the DENR when they have a project in the state, unless the asbestos removal takes place in a residence. (Any occupied building with four or fewer units is considered residential.) The DENR conducts on-site inspections of large asbestos abatement projects. The DENR certifies asbestos workers at five different levels (i.e. workers, contractors or supervisors, inspectors, project designers and management planners). Approximately 300 asbestos workers are certified in South Dakota. There is asbestos abatement handler training offered in the state, but asbestos workers do not have to be trained in South Dakota to be certified here.

Staffing Issues Related to Waste Management

Businesses Operating in the Regulated Environment

Many types of businesses have activities impacted by waste management regulations or programs. In some cases, all businesses in an industry sector are covered by the regulations. (Use the DENR website to determine if a specific type of business activity is covered by the

regulations.) In other cases, the businesses in an industry sector will be impacted only when they perform a specific regulated activity. The following types of businesses and activities are impacted by the waste management regulations: solid waste collection, solid waste landfills, rubble sites, petroleum contaminated soil landfarms, waste tire handling facilities, tire processing facilities, waste tire stockpiling, yard waste composting, sump waste disposal, PCB disposal, meth waste clean-up, pharmaceutical waste disposal, asbestos waste disposal, recycling facilities, environmental engineering services, and environmental consulting services. Examples of the industry sectors containing businesses that perform the listed activities are exhibited in Appendix A.

Staffing of Businesses Operating in the Regulated Environment

Businesses operating in the regulated environment employ a diverse group of employees; some of these employees work in jobs directly related to the environmental regulations, and some do not. During the interviews with DENR staff, they identified the types of workers with whom they deal directly. Those types of workers are listed by occupational title in Appendix B.

In addition, there are the other employees who work in "green jobs" but might not interact with DENR staff. The SD Department of Labor recently completed a separate survey of "green jobs" in the state. Of particular relevance for this report would be "green jobs" in the industries that are impacted by environmental regulations. Those other "green jobs" are listed by occupational title and DENR program in Appendix C.

Factors Impacting Staffing in the Regulated Environment

Depending upon the need, both in-state and out-of-state consultants are utilized by regulated entities to assist with solid and hazardous waste-related issues. Waste Management staff work closely with regulated entities and their consultants to ensure all considerations are recognized and addressed.

New technology allows more hazardous materials to be removed from waste. For example, EPA regulations say more mercury has to be removed from equipment and appliances. The issue becomes where and how to store these additional hazardous materials. There is a push to remove more arsenic and radium from drinking water. The new technology that will be developed to accomplish that task will result in additional solid and hazardous waste regulations and requirements.

New and revised EPA regulations impact the DENR's ability to regulate and business' ability to meet waste management regulations. The new Coal Combustion Residue regulations say mineral impurities in the residue must be properly disposed of. This residue could be just solid waste or hazardous waste. If it is hazardous waste, the permit process will take much longer and businesses will be impacted. In addition, EPA is talking about changing the definition of solid waste, which will impact the definition of what is considered hazardous waste. The change in whether materials are defined as hazardous will also impact what businesses will have to do to ensure compliance.

The EPA changes previously discussed will also impact the DENR waste management workload and training needs. Permitting will take much longer when more materials are considered hazardous waste. DENR staff will have to train more on landfill guidelines and procedures. Solid waste staff will have to obtain more hazardous waste training, and hazardous waste staff will have to obtain more solid waste training.

Appendix A

Types of Businesses Impacted by DENR Regulations by NAICS* Industry Code & Title

Types of Businesses Impacted by Air Quality Regulations by NAICS* Industry Code & Title	
NAICS Code*	**NAICS Title**
211111	Crude Petroleum and Natural Gas Extraction
212319	Other Crushed and Broken Stone Mining and Quarrying
212321	Construction Sand and Gravel Mining
213111	Drilling Oil and Gas Wells
213112	Support Activities for Oil and Gas Operations
221112	Fossil Fuel Electric Power Generation
221210	Natural Gas Distribution
311222	Soybean Processing
324121	Asphalt Paving Mixture and Block Manufacturing
325193	Ethyl Alcohol Manufacturing
325199	All Other Basic Organic Chemical Manufacturing
327310	Cement Manufacturing
327991	Cut Stone and Stone Product Manufacturing
327999	All Other Miscellaneous Nonmetallic Mineral Product Manufacturing
337110	Wood Kitchen Cabinet and Countertop Manufacturing
337122	Non-upholstered Wood Household Furniture Manufacturing
337211	Wood Office Furniture Manufacturing
424510	Grain and Field Bean Merchant Wholesalers (including grain elevators)
424610	Chemical and Allied Products Merchant Wholesalers
424690	Other Chemical and Allied Products Merchant Wholesalers
424710	Petroleum Bulk Stations and Terminals
424720	Petroleum and Petroleum Products Merchant Wholesalers (except Bulk Stations and Terminals)
486210	Pipeline Transportation of Natural Gas
493130	Farm Product Warehousing and Storage (including grain storage elevators)
541330	Engineering Services (including environmental engineering services)
541380	Testing Laboratories (including radon testing labs or services)
541620	Environmental Consulting Services
562111	Solid Waste Collection
562112	Hazardous Waste Collection
562212	Solid Waste Landfill

Types of Businesses Impacted by Air Quality Regulations, continued by NAICS* Industry Code & Title	
NAICS Code*	**NAICS Title**
562910	Remediation Services (including asbestos removal contractors)
622110	General Medical and Surgical Hospitals
622210	Psychiatric and Substance Abuse Hospitals
622310	Specialty (except Psychiatric and Substance Abuse) Hospitals
811121	Automotive Body, Paint, and Interior Repair and Maintenance
812320	Drycleaning and Laundry Services (except Coin-Operated)
921140	Executive and Legislative Offices, Combined
923120	Administration of Public Health Programs
924110	Administration of Air and Water Resource and Solid Waste Management Programs
**NAICS - North American Industry Classification System*	

Types of Businesses Impacted by Drinking Water Quality Regulations by NAICS* Industry Code & Title	
NAICS Code*	**NAICS Title**
221310	Water Supply and Irrigation Systems
237110	Water and Sewer Line and Related Structures Construction
237310	Highway, Street and Bridge Construction
312112	Bottled Water Manufacturing
541310	Architectural Services
541330	Engineering Services (including environmental engineering services)
541370	Surveying and Mapping (except Geophysical) Services
541380	Testing Laboratories (drinking water analysis)
541620	Environmental Consulting Services
611310	Colleges, Universities, and Professional Schools (including water testing laboratories at universities)
713110	Amusement and Theme Parks
923120	Administration of Public Health Programs (including water testing labs in city government and health labs in state government)
924110	Administration of Air and Water Resource and Solid Waste Management Programs
**NAICS - North American Industry Classification System*	

Types of Businesses Impacted by Ground Water Quality Regulations by NAICS* Industry Code & Title	
NAICS Code*	**NAICS Title**
112112	Cattle Feedlots
112120	Dairy Cattle and Milk Production
112210	Hog and Pig Farming
211111	Crude Petroleum and Natural Gas Extraction
212221	Gold Ore Mining
212319	Other Crushed and Broken Stone Mining and Quarrying
212321	Construction Sand and Gravel Mining
213112	Support Activities for Oil and Gas Operations
221320	Sewage Treatment Facilities
236220	Commercial and Institutional Building Construction
237110	Water and Sewer Line and Related Structures Construction
237310	Highway, Street and Bridge Construction
237990	Other Heavy and Civil Engineering Construction
423830	Industrial Machinery and Equipment Merchant Wholesalers
424710	Petroleum Bulk Stations and Terminals
424720	Petroleum and Petroleum Products Merchant Wholesalers (except Bulk Stations and Terminals)
541310	Architectural Services
541330	Engineering Services (including environmental engineering services)
541370	Surveying and Mapping (except Geophysical) Services
541380	Testing Laboratories (ground water analysis)
541620	Environmental Consulting Services
562910	Remediation Services
562920	Materials Recovery Facilities
924110	Administration of Air and Water Resource and Solid Waste Management Programs
**NAICS - North American Industry Classification System*	

Types of Businesses Impacted by Surface Water Quality Regulations by NAICS* Industry Code & Title	
NAICS Code*	**NAICS Title**
112112	Cattle Feedlots
112120	Dairy Cattle and Milk Production
112210	Hog and Pig Farming
115112	Soil Preparation, Planting, and Cultivating
211111	Crude Petroleum and Natural Gas Extraction
212221	Gold Ore Mining
212319	Other Crushed and Broken Stone Mining and Quarrying
212321	Construction Sand and Gravel Mining
212325	Clay and Ceramic and Refractory Minerals Mining (including bentonite)
213111	Drilling Oil and Gas Wells
213112	Support Activities for Oil and Gas Operations
221320	Sewage Treatment Facilities
236220	Commercial and Institutional Building Construction
237110	Water and Sewer Line and Related Structures Construction
237310	Highway, Street and Bridge Construction
237990	Other Heavy and Civil Engineering Construction
238910	Site Preparation Contractors
311111	Dog and Cat Food Manufacturing
311222	Soybean Processing
311611	Animal (except Poultry) Slaughtering
311615	Poultry Processing
325193	Ethyl Alcohol Manufacturing
541310	Architectural Services
541330	Engineering Services (including environmental engineering services)
541370	Surveying and Mapping (except Geophysical) Services
541380	Testing Laboratories (ground water analysis)
541620	Environmental Consulting Services
561710	Exterminating and Pest Control Services
562111	Solid Waste Collection
562212	Solid Waste Landfills
562910	Remediation Services
562991	Septic Tank and Related Services
562998	All Other Miscellaneous Waste Management (including grease trap cleaning)
611310	Colleges, Universities, and Professional Schools

Types of Businesses Impacted by Surface Water Quality Regulations. cont. by NAICS* Industry Code & Title	
NAICS Code*	**NAICS Title**
924110	Administration of Air and Water Resource and Solid Waste Management Programs
924120	Administration of Conservation Programs
926120	Regulation and Administration of Transportation Program
**NAICS - North American Industry Classification System*	

Types of Businesses Impacted by Minerals & Mining Regulations by NAICS* Industry Code & Title	
NAICS Code*	**NAICS Title**
115112	Soil Preparation, Planting, and Cultivating
211111	Crude Petroleum and Natural Gas Extraction
212221	Gold Ore Mining
212319	Other Crushed and Broken Stone Mining and Quarrying
212321	Construction Sand and Gravel Mining
212325	Clay and Ceramic and Refractory Minerals Mining (including bentonite)
213111	Drilling Oil and Gas Wells
213112	Support Activities for Oil and Gas Operations
541310	Architectural Services
541330	Engineering Services (including environmental engineering services)
541370	Surveying and Mapping (except Geophysical) Services
541380	Testing Laboratories (ground water analysis)
541620	Environmental Consulting Services
561730	Landscaping Services
562910	Remediation Services
921110	Executive Offices
924120	Administration of Conservation Programs (including U.S. Forest Service and Natural Resources Conservation Services)
926110	Administration of General Economic Programs (including State Archeologist)
926120	Regulation and Administration of Transportation Program
**NAICS - North American Industry Classification System*	

Types of Businesses Impacted by Waste Management Regulations by NAICS* Industry Code & Title	
NAICS Code*	**NAICS Title**
211111	Crude Petroleum and Gas Extraction
213112	Support Activities for Oil and Gas Operations
237110	Water and Sewer Line and Related Structures Construction
237310	Highway, Street, and Bridge Construction
321114	Sawmills and Wood Preservation
324121	Asphalt Paving Mixture and Block Manufacturing
325998	All Other Miscellaneous Chemical Product and Preparation Manufacturing
327320	Ready-Mix Concrete Manufacturing
332710	Machine Shops
423120	Motor Vehicle Supplies and New Parts Merchant Wholesalers
423140	Motor Vehicle Parts (Used) Merchant Wholesalers
423730	Warm Air Heating and Air-Conditioning Equipment and Supplies Merchant Wholesalers
423930	Recyclable Material Merchant Wholesalers
424710	Petroleum Bulk Stations and Terminals
424720	Petroleum and Petroleum Products Merchant Wholesalers (except Bulk Stations and Terminals)
441120	Used Car Dealers
441310	Automotive Parts and Accessories Stores
443111	Household Appliance Stores
447110	Gasoline Stations with Convenience Stores
447190	Other Gasoline Stations
452910	Warehouse Clubs and Supercenters
454312	Liquefied Petroleum Gas (Bottled Gas) Dealers
484110	General Freight Trucking, Local
484230	Specialized Freight Trucking, Long Distance (including hazardous waste)
532490	Other Commercial and Industrial Machinery and Equipment Rental and Leasing
541330	Engineering Services
541370	Surveying and Mapping Services
541380	Testing Laboratories
541620	Environmental Consulting Services
561730	Landscaping Services
562111	Solid Waste Collection
562112	Hazardous Waste Collection
562119	Other Waste Collection
562212	Solid Waste Landfills

Types of Businesses Impacted by Waste Management Regulations, cont. by NAICS* Industry Code & Title	
NAICS Code*	**NAICS Title**
562910	Remediation Services
562991	Septic Tank and Related Services
562998	All Other Miscellaneous Waste Management Services (including grease trap cleaning)
811111	General Automotive Repair
811113	Automotive Transmission Repair
811121	Automotive Body, Paint, and Interior Repair and Maintenance
811412	Appliance Repair and Maintenance
924110	Administration of Air and Water Resource and Solid Waste Management Programs
**NAICS - North American Industry Classification System*	

For more information on the North American Industry Classification System (NAICS), please visit www.census.gov/eos/www/naics.

Appendix B

Green Job Titles Indicated by DENR Staff as being Impacted by Regulations

- Air quality engineer
- Air quality professional
- Air quality safety officer
- Ambient air monitor and tester
- Asbestos abatement worker
- Biologist
- Boiler operator
- Chemical plating equipment operator
- City engineer
- City planner
- Civil Engineer
- Community planner
- Construction air quality consultant
- County planner
- Environmental specialist
- Environment and safety officer
- Hazardous materials remediatior
- Hydrologist
- Landfill operator
- Mining engineer
- Mine environmental coordinator
- Mine permitting specialist
- Oil and gas drilling contractor
- Oil and gas landman
- Oil and gas well operator
- Petroleum remediator
- Petroleum contaminated soil landfarm operator
- Radon testing & mitigation consultant
- Stack tester (air emissions)
- Surface reclamation contractor
- Underground and above-ground tank installer
- Water tester (laboratory)
- Water treatment plant operator
- Waste tire handler
- Wastewater treatment plant operator

Appendix C

Occupations Involving Green Activities Employed in the Types of Businesses Impacted by DENR Regulations by SOC* Occupational Code & Title

Occupations Involving Green Activities Employed in the Types of Businesses Impacted by Air Quality Regulations by SOC* Occupational Code & Title	
SOC* Code	**SOC* Title**
111021	General and Operations Managers
131061	Emergency Management Specialists
132021	Appraisers and Assessors of Real Estate
172021	Agricultural Engineers
172051	Civil Engineers
172071	Electrical Engineers
172199	Engineers, All Other
173011	Architectural and Civil Drafters
173019	Drafters, All Other
173022	Civil Engineering Technicians
173025	Environmental Engineering Technicians
192031	Chemists
193051	Urban and Regional Planners
194091	Environmental Science and Protection Technicians, including Health
292012	Medical and Clinical Laboratory Technicians
292099	Health Technologists and Technicians, All Other
371011	First-Line Supervisors/Managers of Housekeeping and Janitorial Workers
371012	First-Line Supervisors/Managers of Landscaping, Lawn Service and Groundskeeping Workers
372011	Janitors and Cleaners, except Maids and Housekeeping Cleaners
373011	Landscaping and Groundskeeping Workers
373012	Pesticide Handlers, Sprayers and Applicators, Vegetation
434031	Court, Municipal and License Clerks
435071	Shipping, Receiving and Traffic Clerks
472073	Operating Engineers and Other Construction Equipment Operators
474041	Hazardous Materials Removal Workers
474099	Construction and Related Workers, All Other

Occupations Involving Green Activities Employed in the Types of Businesses Impacted by Air Quality Regulations by SOC* Occupational Code & Title, continued

SOC* Code	SOC* Title
475031	Explosives Workers, Ordnance Handling Experts and Blasters
493021	Automotive Body and Related Repairers
499021	Heating, Air Conditioning and Refrigeration Mechanics and Installers
499042	Maintenance and Repair Workers, General
511011	First-Line Supervisors/Managers of Production and Operating Workers
517011	Cabinetmakers and Bench Carpenters
517041	Sawing Machine Setters, Operators and Tenders, Wood
518031	Water and Liquid Waste Treatment Plant and System Operators
518091	Chemical Plant and System Operators
519199	Production Workers, All Other
533032	Truck Drivers, Heavy and Tractor-Trailer
537081	Refuse and Recyclable Material Collectors

**SOC - Standard Occupational Classification*

Occupations Involving Green Activities Employed in the Types of Businesses Impacted by Drinking Water Quality Regulations by SOC* Occupational Code & Title

SOC* Code	SOC* Title
111021	General and Operations Managers
113011	Administrative Services Managers
171011	Architects, except Landscape and Naval
172021	Agricultural Engineers
172051	Civil Engineers
172071	Electrical Engineers
172199	Engineers, All Other
173011	Architectural and Civil Drafters
173019	Drafters, All Other
173022	Civil Engineering Technicians
173025	Environmental Engineering Technicians
191031	Conservation Scientists
194091	Environmental Science and Protection Technicians, including Health
251053	Environmental Science Teachers, Postsecondary
271021	Commercial and Industrial Designers
273031	Public Relations Specialists
292012	Medical and Clinical Laboratory Technicians
292099	Health Technologists and Technicians, All Other
419099	Sales and Related Workers, All Other
472031	Carpenters
472071	Paving, Surfacing and Tamping Equipment Operators
475021	Earth Drillers, except Oil and Gas
499042	Maintenance and Repair Workers, General
518031	Water and Liquid Waste Treatment Plant and System Operators

**SOC - Standard Occupational Classification*

Occupations Involving Green Activities Employed in the Types of Businesses Impacted by Ground Water Quality Regulations by SOC* Code & Occupational Title

SOC* Code	SOC* Title
111021	General and Operations Managers
119021	Construction Managers
131051	Cost Estimators
171011	Architects, except Landscape and Naval
172021	Agricultural Engineers
172051	Civil Engineers
172071	Electrical Engineers
172081	Environmental Engineers
172199	Engineers, All Other
173011	Architectural and Civil Drafters
173019	Drafters, All Other
173022	Civil Engineering Technicians
173025	Environmental Engineering Technicians
194091	Environmental Science and Protection Technicians, including Health
271021	Commercial and Industrial Designers
292012	Medical and Clinical Laboratory Technicians
419099	Sales and Related Workers, All Other
452091	Agricultural Equipment Operators
452093	Farmworkers, Farm and Ranch Animals
472031	Carpenters
472061	Construction Laborers
472071	Paving, Surfacing and Tamping Equipment Operators
474041	Hazardous Materials Removal Workers
474099	Construction and Related Workers, All Other
475021	Earth Drillers, except Oil and Gas
475031	Explosives Workers, Ordnance Handling Experts and Blasters
499021	Heating, Air Conditioning and Refrigeration Mechanics and Installers
499042	Maintenance and Repair Workers, General
499044	Millwrights
518021	Stationary Engineers and Boiler Operators
518031	Water and Liquid Waste Treatment Plant and System Operators
533032	Truck Drivers, Heavy and Tractor-Trailer

**SOC - Standard Occupational Classification*

Occupations Involving Green Activities Employed in the Types of Businesses Impacted by Surface Water Quality Regulations by SOC* Code & Occupational Title	
SOC* Code	**SOC* Title**
111021	General and Operations Managers
113011	Administrative Services Managers
119021	Construction Managers
131051	Cost Estimators
131111	Management Analysts
171011	Architects, except Landscape and Naval
172021	Agricultural Engineers
172051	Civil Engineers
172071	Electrical Engineers
172081	Environmental Engineers
172199	Engineers, All Other
173011	Architectural and Civil Drafters
173019	Drafters, All Other
173022	Civil Engineering Technicians
173025	Environmental Engineering Technicians
191013	Soil and Plant Scientists
191029	Biological Scientists, All Other
191031	Conservation Scientists
192031	Chemists
194021	Biological Technicians
194061	Social Science Research Assistants
194091	Environmental Science and Protection Technicians, including Health
194093	Forest and Conservation Technicians
251053	Environmental Science Teachers, Postsecondary
259021	Farm and Home Management Advisors
271021	Commercial and Industrial Designers
273031	Public Relations Specialists
292012	Medical and Clinical Laboratory Technicians
373011	Landscaping and Groundskeeping Workers
419099	Sales and Related Workers, All Other
435071	Shipping, Receiving and Traffic Clerks
452091	Agricultural Equipment Operators
452093	Farmworkers, Farm and Ranch Animals
454011	Forest and Conservation Workers

Occupations Involving Green Activities Employed in the Types of Businesses Impacted by Surface Water Quality Regulations by SOC* Code & Occupational Title, continued	
SOC* Code	**SOC* Title**
472031	Carpenters
472061	Construction Laborers
472071	Paving, Surfacing and Tamping Equipment Operators
474041	Hazardous Materials Removal Workers
474099	Construction and Related Workers, All Other
475021	Earth Drillers, except Oil and Gas
475031	Explosives Workers, Ordnance Handling Experts and Blasters
499021	Heating, Air Conditioning and Refrigeration Mechanics and Installers
499042	Maintenance and Repair Workers, General
499044	Millwrights
511011	First-Line Supervisors/Managers of Production and Operating Workers
518021	Stationary Engineers and Boiler Operators
518031	Water and Liquid Waste Treatment Plant and System Operators
518091	Chemical Plant and System Operators
519199	Production Workers, All Other
536099	Transportation Workers, All Other
537081	Refuse and Recyclable Material Collectors
**SOC - Standard Occupational Classification*	

Occupations Involving Green Activities Employed in the Types of Businesses Impacted by Minerals & Mining Regulations by SOC* Code & Occupational Title

SOC* Code	SOC* Title
171011	Architects, except Landscape and Naval
172021	Agricultural Engineers
172051	Civil Engineers
172071	Electrical Engineers
172199	Engineers, All Other
173011	Architectural and Civil Drafters
173019	Drafters, All Other
173022	Civil Engineering Technicians
173025	Environmental Engineering Technicians
191013	Soil and Plant Scientists
191029	Biological Scientists, All Other
191031	Conservation Scientists
194021	Biological Technicians
194061	Social Science Research Assistants
194091	Environmental Science and Protection Technicians, including Health
194093	Forest and Conservation Technicians
259021	Farm and Home Management Advisors
271021	Commercial and Industrial Designers
292012	Medical and Clinical Laboratory Technicians
373011	Landscaping and Groundskeeping Workers
452091	Agricultural Equipment Operators
454011	Forest and Conservation Workers
474041	Hazardous Materials Removal Workers
474099	Construction and Related Workers, All Other
475031	Explosives Workers, Ordnance Handling Experts and Blasters
499042	Maintenance and Repair Workers, General
511011	First-Line Supervisors/Managers of Production and Operating Workers
518031	Water and Liquid Waste Treatment Plant and System Operators
536099	Transportation Workers, All Other

**SOC - Standard Occupational Classification*

Occupations Involving Green Activities Employed in the Types of Businesses Impacted by Waste Management Regulations by SOC* Code & Occupational Title

SOC* Code	SOC* Title
111021	General and Operations Managers
131041	Compliance Officers, except Agriculture, Construction, Health and Safety and Transportation
132011	Accountants and Auditors
172021	Agricultural Engineers
172051	Civil Engineers
172071	Electrical Engineers
172199	Engineers, All Other
173011	Architectural and Civil Drafters
173019	Drafters, All Other
173022	Civil Engineering Technicians
173025	Environmental Engineering Technicians
292012	Medical and Clinical Laboratory Technicians
372011	Janitors and Cleaners, except Maids and Housekeeping Cleaners
412011	Cashiers
412031	Retail Salespersons
414012	Sales Representatives, Wholesale and Manufacturing, except Technical and Scientific Products
419099	Sales and Related Workers, All Other
431011	First-Line Supervisors/Managers of Office and Administrative Support Workers
436011	Executive Secretaries and Administrative Assistants
472031	Carpenters
472071	Paving, Surfacing and Tamping Equipment Operators
474041	Hazardous Materials Removal Workers
474099	Construction and Related Workers, All Other
475021	Earth Drillers, except Oil and Gas
475031	Explosives Workers, Ordnance Handling Experts and Blasters
491011	First-Line Supervisors/Managers of Mechanics, Installers and Repairers
493021	Automotive Body and Related Repairers
493023	Automotive Service Technicians and Mechanics
499012	Control and Valve Installers and Repairers, except Mechanical Door
499021	Heating, Air Conditioning and Refrigeration Mechanics and Installers
499031	Home Appliance Repairers
499042	Maintenance and Repair Workers, General
514041	Machinists

Occupations Involving Green Activities Employed in the Types of Businesses Impacted by Waste Management Regulations by SOC* Code & Occupational Title, continued	
SOC* Code	**SOC* Title**
518031	Water and Liquid Waste Treatment Plant and System Operators
518091	Chemical Plant and System Operators
519121	Coating, Painting and Spraying Machine Setters, Operators and Tenders
519199	Production Workers, All Other
533032	Truck Drivers, Heavy and Tractor-Trailer
533033	Truck Drivers, Light or Delivery Services
537062	Laborers and Freight, Stock and Material Movers, Hand
537081	Refuse and Recyclable Material Collectors
**SOC - Standard Occupational Classification*	

For more information on the Standard Occupational Classification (SOC) system, please visit www.bls.gov/soc/2000/soc_majo.htm.