



Utah Department of Environmental Quality

Utah's Environment 2013

DEQ's Annual Report



How to Use this Report

This report is divided into five categories for easy scanning. These categories correspond to activities and programs within the Department of Environmental Quality that share a common purpose or outcome. An introductory summary for each section and table of contents helps readers find information quickly and easily.

The report can be read:

- from beginning to end;
- by section; or,
- by area of interest.

Thank you for your interest in Utah's environment. For more information, visit our Web site (DEQ.Utah.gov), follow us on Facebook or Twitter, or sign up for e-mail alerts.

Sources for the information in this report include the Environmental Protection Agency and Department of Environmental Quality scientists and engineers.

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We promise to continue our hard work and are unwavering in our commitment to protecting and improving the quality of Utah's air, land, and water.

From the Executive Director



Each year, the Department of Environmental Quality highlights its environmental accomplishments in the State of the Environment Report.

Air Quality

Our citizens, governments, and businesses have made it clear that air quality is a top priority for our state. We are committed to finding solutions to our seasonal air pollution challenges.

We made significant progress this year. We finalized the PM_{2.5} State Implementation Plan (SIP) to reduce fine particulate air pollution along the Wasatch Front and the Cache Valley. The SIP includes 23 new area source rules that will reduce emissions from painting and degreasing, printing and publishing, commercial cooking, and consumer products. A comprehensive analysis of emissions reductions from point sources will result in 4,600 fewer tons per year of industrial emissions by 2019. We collected important data on the causes of wintertime ozone in the Uinta Basin and will be working with our study partners again in 2014. We will continue to lead the charge in 2014 for improved air quality through rulemaking, community partnerships, research, and public outreach.

Partnerships and Outreach

Our partnerships with local health departments are critical to our mission to safeguard public health. Recent collaborations with health departments on vehicle I/M programs, wastewater systems, a public awareness campaign for ozone, and drinking water safety helped protect the health of residents across the state. We worked closely with stakeholders on environmental issues, this past year, most notably on proactive approaches to reduce excess nitrogen and phosphorous in Utah waterways.

Education and Technology

We continue to expand our use of technology platforms. We teamed up with the National Center for Automotive Science and Technology to develop the UtahAir mobile app, a free smartphone application that delivers real-time air quality information. Training screencasts deliver important information to water system operators, many of whom are located in small rural communities. A new online database gives the public access to information about environmental incidents in their communities.

Assistance

We extended financial and technical assistance to a number of entities for environmental projects. We provided oversight for the cleanup and remediation of a

diesel spill at Willard Bay State Park. Our staff ensured that X-ray machines were calibrated accurately, that low-cost radon test kits were available to the public, that used oil and waste tires were disposed of properly, and that communities had adequate funding to construct systems to supply safe drinking water to their residents.

Our Promise to You

We would like to thank you for your interest in the state of Utah's environment. Your participation, input, and insight are important to us. Our state faces some challenging environmental problems and it will take all of us working together to find solutions. We are proud of our accomplishments in 2013, but much remains to be done. We promise to continue our hard work and are unwavering in our commitment to protect and improve the quality of Utah's air, land, and water.

Amanda Smith
Executive Director, DEQ

Emission reduction strategies will deliver improved air quality now, with cumulative reductions bringing Utah nonattainment areas into compliance with federal air quality standards by 2019.

Planning and Analysis

Intro/Summary

Comprehensive, systematic planning and analysis provide essential information for agency decision making. Research, data collection and analysis, modeling, evaluation and assessment of findings form the basis for effective plan development and implementation.

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PM_{2.5} State Implementation Plan Completed

The Air Quality Board voted unanimously to approve the PM_{2.5} State Implementation Plan (SIP) in 2013. The PM_{2.5} SIP will phase in new rules and regulations over the next five years to reduce emissions from industries, large manufacturers, small businesses, homeowners, and consumers. Emission reduction strategies in the SIP will deliver improved air quality now, with cumulative reductions bringing Utah nonattainment areas into compliance with federal air quality standards by 2019.

Utah's Unique Air Quality Challenges

Utah's topography, weather patterns, and growing population contribute to a build-up of pollutants during wintertime inversions. Winter inversions are a common event in Utah, generally occurring between December and February. Inversions occur when normal atmospheric conditions (cool air above, warm air below) invert. These inversions trap a dense layer of cold air under a layer of warm air. The warm layer acts like a lid, trapping emissions from vehicles, businesses, and industrial processes in the cold air near the valley floor. These emissions mix in this cold layer of air to form fine particulates.

Prolonged inversions can lead to high levels of fine

particulate pollution, or PM_{2.5}. These high pollutant levels create significant health and air quality concerns, particularly on days when the concentrations exceed the national health standards.

Particulate Pollution

Particulate matter (PM) is a mixture of solid particles and liquid droplets. It appears as soot or smoke when the particles are large, and is detectable only with an electron microscope when it is small.

Fine particulates are less than or equal to 2.5 micrometers in diameter and are measured in micrograms per cubic meter (µg/m³). Because of their small size (approximately 1/30th the width of the average human hair), fine particulates can pass through the nose and throat, lodge deeply in the lungs, and pass across the lungs into the cardiovascular system. They aggravate health conditions such as asthma, chronic obstructive pulmonary disorder (COPD), and other respiratory illnesses. Fine particulates are a specific concern for the very young, the elderly, and anyone with respiratory disorders.

There are two types of fine particulates: primary and secondary. Primary PM_{2.5} is emitted directly as a particle

and enters the atmosphere as soot. Secondary particulates form when precursor emissions react in the atmosphere to create $PM_{2.5}$. Most of Utah's $PM_{2.5}$ pollution comes from secondary particles.

The health-based National Ambient Air Quality Standards (NAAQS) regulate concentrations of $PM_{2.5}$. Fine particulates are subject to two standards: a 24-hour standard of $35 \mu\text{g}/\text{m}^3$ and an annual standard of $12 \mu\text{g}/\text{m}^3$.

Utah meets the annual standard in all areas of the state. Salt Lake and Davis Counties and parts of Utah, Weber, Box Elder, Tooele, and Cache counties exceed the 24-hour standard at times during the winter. As a result, the Environmental Protection Agency (EPA) has designated these areas as nonattainment.

SIP Development Process

After the EPA designated areas along the Wasatch Front

and Cache County as nonattainment for $PM_{2.5}$ in 2006, the Division of Air Quality (DAQ) initiated a three-year process to develop a SIP to reduce current $PM_{2.5}$ emissions and bring fine particulate levels below the standard.

Through the SIP development process, DAQ:

- identified the sources of emissions through emissions inventories;
- developed a model to mimic atmospheric conditions; and,
- tested possible emission reduction strategies.

DAQ scientists worked with industry and local transportation planning organizations to gather industry and mobile emissions data. Scientists used EPA's emission factors and local data for other sources. DAQ used this collective emissions data to understand the types and quantity of emissions emitted into the atmosphere.

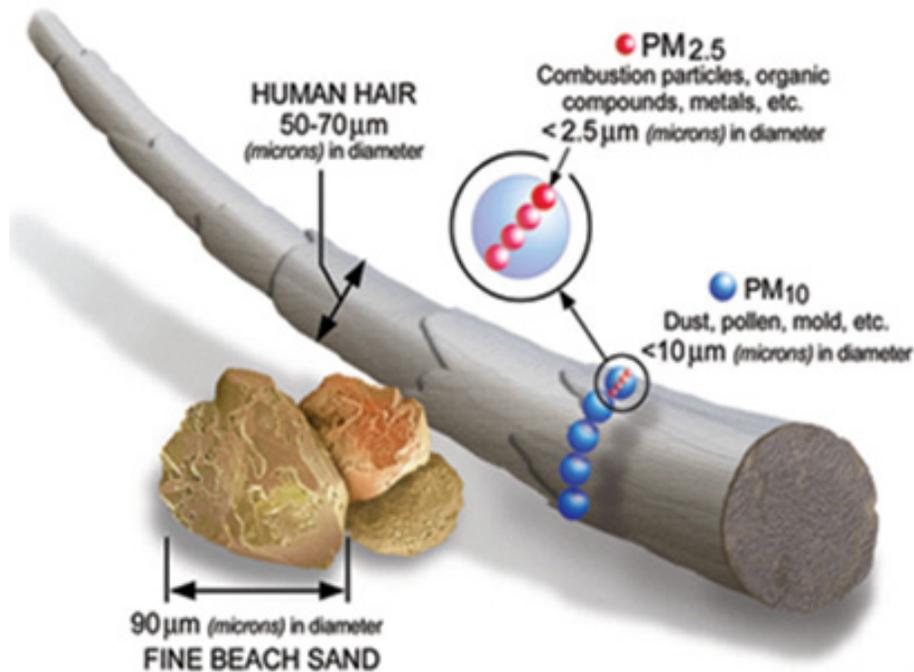


Image courtesy of the U.S. EPA

Once DAQ developed the inventory, scientists used a computer model developed by EPA and the National Oceanic and Atmospheric Administration to replicate conditions during high pollution days to test reduction strategies. Scientists collected strategies used by other states for their SIPs and obtained recommendations from stakeholders, industry, and working groups specifically created to solicit broad public input during the SIP development process. Once DAQ identified emission controls, scientists ran them through the model to determine their ability to reduce $PM_{2.5}$ pollution.

Incremental Emission Reduction Strategies

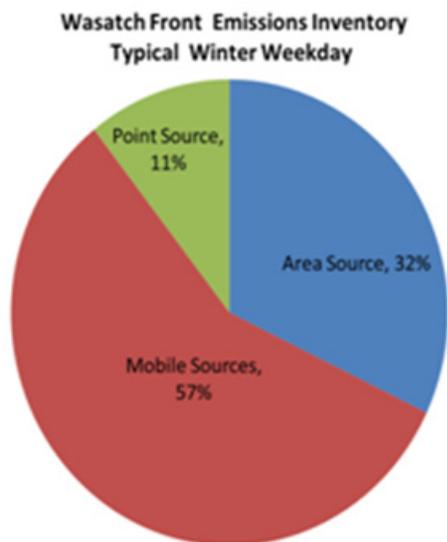
Because past SIPs for Total Suspended Particulates and PM_{10} led to considerable reductions in the emissions that form particulates, it was challenging to find additional control strategies to reduce these emissions further. To be included in the SIP, a strategy not only had to reduce $PM_{2.5}$, but also had to be:

- Enforceable
- Sustainable
- Cost Effective

DAQ found that emission reduction strategies that offer smaller, incremental improvements were the best means for bringing these areas into attainment.

Air quality modeling identified volatile organic compounds (VOCs) as a significant contributor to elevated $PM_{2.5}$ concentrations. VOCs proved to be more limiting in the overall atmospheric chemistry than nitrogen oxides (NO_x) so DAQ focused on control strategies that addressed VOC emissions. While primary $PM_{2.5}$ is a relatively small portion of overall $PM_{2.5}$ emissions, reductions in primary particulates directly improve future $PM_{2.5}$ concentrations.

DAQ gave priority to those source categories or pollutants responsible for relatively larger percentages of emissions leading to exceedances of the $PM_{2.5}$ standards when identifying SIP control measures.



Mobile Sources

The Wasatch Front is among the fastest growing regions of the country. Vehicles contribute over half of the emissions that lead to the formation of $PM_{2.5}$ during winter inversions, so reducing mobile source emissions in nonattainment areas is a priority.

The combination of Tier 2 federal fleet standards and local transportation plans to reduce trips and vehicle miles traveled will result in up to a 50 percent reduction in vehicle emissions by 2019. Transportation plans and programs by municipal planning organizations and UDOT within the Salt Lake and Utah County nonattainment areas will need to conform to emission budgets in the SIP to ensure that transportation activities do not interfere with air quality progress.

Point Sources

Large manufacturing (point) sources will reduce their emissions through the installation of Best Available Control Technology (BACT) required under the SIP. Costs to install point source controls will range between \$1,357 to \$25,319 per ton of reduction. Point sources will also be required to offset any future emission increases through the nonattainment area banking and trading program.

Utah's oil refineries will see the largest emissions reductions from the required application of state-of-the-art emissions controls. When fully implemented, these controls will reduce annual emissions by over 2,000 tons per year from current emission rates.

The permitting process and previous SIPs have regularly controlled emissions from point sources. Additional emission controls imposed by the Salt Lake and Provo $PM_{2.5}$ SIPs will result in 4,600 fewer tons per year emitted from point sources along the Wasatch Front.

Area Sources

Area Sources are smaller, localized emission sources that include small businesses, manufacturers, home and commercial heating, food preparation, and printing services. The Air Quality Board, as part of the SIP, approved 23 new area source rules that will reduce area source emissions.

New area source rules will reduce emissions from:

- Commercial Cooking
- Consumer Products
- Printing and Publishing
- Painting and Degreasing
- Wood Stoves and Boilers

Costs to install area source controls will range between \$238 to \$6,560 per ton. The SIP will require outlying counties to use only the most cost effective strategies, since

air quality models show minimal benefit from additional controls in these areas.

Public Input and the SIP Process

Public involvement has been a key piece of the $PM_{2.5}$ SIP development. DAQ met with over 100 stakeholders from each of the six nonattainment areas during the development process. Stakeholder working groups provided ideas and recommendations for emission control strategies that matched community needs. These workgroup recommendation, combined with public input and comments, reduced $PM_{2.5}$ levels to within a few micrograms of the standard.

DAQ received more than 650 comments during the 30-day public comment period for the Salt Lake-Provo $PM_{2.5}$ SIP. The Division reviewed and made changes and adjustments to the proposed SIP based on this feedback.

Next Steps

The $PM_{2.5}$ SIP goes to the Environmental Protection Agency for federal review and approval. Utah has five years to bring its nonattainment areas into compliance with the National Ambient Air Quality Standards based on the strategies outlined in the SIP.

Point Sources to Provide Added Emission Reductions

Stationary sources in nonattainment areas will emit 4,500 fewer tons per year (tpy) by 2019 under control strategies identified in the Reasonably Available Control Technology (RACT) analysis for the PM_{2.5} State Implementation Plan (SIP). The Division of Air Quality (DAQ) evaluated thirty point sources to ensure that their emission controls meet RACT standards. Emission reductions from these point sources will help nonattainment areas in the state meet SIP requirements for PM_{2.5}.

What is RACT?

Under the Clean Air Act (CAA), areas in nonattainment for the National Ambient Air Quality Standards (NAAQS) must ensure RACT is applied on stationary sources when developing a SIP. The Environmental Protection Agency (EPA) defines RACT as “the lowest emission limitation that a particular source is capable of meeting by the application of control technology that is reasonably available considering technological and economic feasibility.”

RACT Analysis

A RACT analysis consists of three steps:

- Identify technologically and economically feasible options.
- Evaluate these options collectively in the air quality model.
- Select the candidate control measures to include in the overall SIP strategy.

DAQ specifically evaluated each of the thirty point sources as part of its control strategy analysis for the PM_{2.5} SIP. Using the 2008 baseline emissions inventory as a starting point, DAQ compiled a list of all equipment at sources and identified the probable emissions from the equipment.

The Division developed a list of potential control options for each targeted emission unit using information from point sources and independent DAQ analysis. An outside contractor was used to review fifteen of the more complicated point sources to provide an independent third-party analysis of the available options and control costs. DAQ based its final RACT list on comments and information from the EPA, stakeholders, and the independent contractor.

These control options were then evaluated using economic, energy, and environmental considerations. DAQ ranked technically feasible controls using the following criteria:

- Reduction of Pollutants of Interest
- Economic Feasibility
- Energy Impacts
- Environmental Impacts
- Implementation Schedule

The table to the right shows the combined emission reductions by 2019 from control measures for large stationary sources for each nonattainment area.

RACT analysis is an important component of the SIP development process. Implementation of controls from the RACT analysis for the PM_{2.5} SIP will lead to significant emission reductions from point sources and improve state air quality over the long term.

Nonattainment Areas Combined Emissions Reductions by 2019 (tons per year)		
	Salt Lake City	Provo
Particulate Matter (PM _{2.5})	237.8	0.0
Sulfur dioxide (SO ₂)	1,718.1	0.0
Nitrogen Oxides (NO _x)	1,370.7	28.1
Volatile Organic Compounds (VOCs)	1,020.2	192.8



Uinta Basin Ozone Study

Teams of scientists continued their work in the Uinta Basin this year to identify the sources and conditions that create ozone during winter inversions. The Division of Air Quality (DAQ) and its partners collected additional data this winter to improve their understanding of the atmospheric chemistry that leads to the formation of wintertime ozone in the Basin.

Winter ozone concentrations increase in the Basin when snow cover creates strong temperature inversions. Multi-year ozone studies aim to identify the emissions and photochemical processes that elevate these ozone levels. DAQ will use this data to support development of effective strategies for reducing ozone concentrations to meet the health-based National Ambient Air Quality Standards (NAAQS) in the Uinta Basin.

2013 Uinta Basin Ozone Study

Key Findings

The 2013 Uinta Basin Ozone Study (UBOS) experienced far different wintertime conditions than the 2012 study, when minimal snow cover kept the 8-hour average ozone levels below federal air quality standard of 63 parts per billion (ppb). Persistent snow cover in 2013 led to inversions, which in turn resulted in ozone concentrations well above the NAAQS.

Maximum 8-hour average ozone concentrations at the Ouray air monitoring station during the 2013 study period reached 142 ppb, 89% higher than the federal air quality standards. Ozone values exceeded the NAAQS for 22 days in Vernal and 29 days in Roosevelt. Individual episodes of elevated ozone ranged from 3 to nearly 15 days in length.

Air Quality

- Elevated ozone coincided with elevated levels of VOCs and NO_x, the primary chemical precursors of ozone.
- Ozone concentrations within the Basin are not influenced to any significant extent by the transport of ozone or its precursors from outside of the Basin or the Bonanza Power Plant.

Meteorology

- Elevated winter ozone only occurs with snow cover that leads to temperature inversions.
- Reflection of sunlight from the snow surface significantly increases the rate of ozone formation.
- Complex patterns of light winds appear to contribute to intra-basin mixing of ozone and ozone precursors.

Air Quality Web Page Helps Basin Residents Monitor High Ozone Levels

The Division of Air Quality now includes Duchesne and Uintah counties on its air monitoring and forecasting Web page and mobile app, ensuring that Basin residents have access to real time air quality information.

Current air quality conditions and trends for ozone and PM_{2.5} help residents protect their health and reduce their emissions when air pollution levels exceed federal air quality standards. Industry can also use this information to implement episodic control measures during and preceding high pollution periods.



Chemistry

- Nitrous acid (HONO) and formaldehyde were found to be the biggest contributors to the creation of the chemically reactive radicals that drive ozone formation.
- Oxidized aromatic VOCs (including toluene and xylene) are another significant source of these radicals.

Uncertainties

- Based on 2012 data, VOC reductions appear to reduce ozone but the overall effectiveness is unknown. The effectiveness of NO_x reductions is less certain and under some conditions may increase ozone levels. It is unclear whether NO_x controls become effective when ozone levels are particularly high.
- Unreactive nitrates that recycle into reactive NO_x through chemical reactions in snow and on particles in the atmosphere may impact the effectiveness of NO_x controls.

Control Strategies

- Episodic or seasonal controls may be a useful component of a management strategy for the Basin since elevated ozone levels only occur during winter inversion periods.
- Reductions in emissions of highly reactive VOCs such as aromatics will be beneficial. Ozone response to NO_x reductions is more complex and requires further study.
- Reducing formaldehyde would be an effective way to reduce ozone, but it is not yet clear which sources of formaldehyde are most important.
- Uncertainty in HONO concentrations makes it difficult to predict how responsive ozone will be to reductions in both VOC and NO_x emissions.

Study Partners

The Uinta Basin Ozone Study is a collaborative effort between county, State, and federal entities, industry organizations, and higher education. Researchers for the UBOS 2013 include:

- Utah State University (USU)
- National Oceanic and Atmospheric Administration (NOAA)
- University of Colorado, Boulder (CU)
- University of Wyoming (U of WY)
- University of Washington (UW)
- Utah Department of Environmental Quality (DEQ)

Funding and in-kind support for UBOS 2013 came from:

- The Uintah Impact Mitigation Special Service District (UIMSSD)
- Western Energy Alliance
- Bureau of Land Management (BLM)
- National Oceanic and Atmospheric Administration (NOAA)
- Environmental Protection Agency (EPA)
- Utah Department of Environmental Quality (DEQ)
- Utah Science Technology and Research Initiative (USTAR)
- Utah School and Institutional Trust Lands Administration (SITLA)

Next Steps

The 2014 Basin Study will focus on understanding the nitric acid (HONO) chemistry in the atmosphere and how it might affect the responsiveness of ozone concentrations to VOC and NO_x reduction strategies.

Success Story

DAQ Teams Up with University of Utah Supercomputers for PM_{2.5} SIP Modeling

DAQ and the Center for High Performance Computing (CHPC) at the University of Utah joined forces to run air quality models for the PM_{2.5} State Implementation Plan. DAQ would not have been able to meet the mandatory 2013 Plan deadline without the computational services available to them through CHPC.

Air quality modeling is a critical component of SIP development. Models demonstrate whether proposed emissions control strategies will bring an area into attainment. EPA-approved models run meteorological and emission inputs to evaluate the performance of control strategies. Modeling is a very labor and technology intensive process and requires fast computing speeds and large computer file storage.

“Before we teamed up with the university, we were running air quality models through five PC workstations linked together using a Linux system,” explained Patrick Barickman, section manager for technical analysis at DAQ. “This set-up gave us a ‘poor man’s supercomputer,’ and while it allowed us to run complex models, it was difficult to maintain.”

“We could not have completed our SIP modeling by the deadline without the advanced technical support of CHPC,” declared Barickman.

Utah's Approach for Addressing Nutrient Pollution

DWQ's Nutrient Core Advisory Team

In 2011, DWQ assembled a core stakeholder group to assist with establishing water quality standards for nutrients. The Nutrient Core Team includes representatives from agriculture, drinking water utilities, publicly-owned treatment works (POTW), environmental groups, recreation groups, the brine shrimp industry, storm water interests, and academia. Working in conjunction with DWQ support staff, the Team has been meeting quarterly to discuss the development of nutrient criteria and nutrient reduction programs.

Draft Plan

In August 2012, DWQ presented stakeholders with a draft plan outlining the challenges to addressing nitrogen and phosphorous pollution, including socioeconomic, ecological, engineering, and non-point considerations. The plan included a toolbox of potential comprehensive and adaptive management solutions:

- Nutrient management categories to address site specific concerns (e.g., headwaters, the Great Salt Lake, etc.)
- Numeric standards based on ecological responses in the field, numeric indicators, and narrative criteria, to be phased in based on nutrient management categories.
- Statewide monitoring to identify water bodies with nutrient related problems, including prioritization of impaired sites to ensure remediation efforts and resources focus on areas of greatest need.
- Watershed specific nutrient action plans, including a potential funding mechanism to address nonpoint sources of nutrient pollution.
- Watershed-scale nutrient reduction strategies.

Costs

Nutrient pollution can be costly to fix, particularly when it involves upgrades to wastewater treatment plants. Voluntary measures to reduce nonpoint source pollution are relatively less expensive than capital and operating and maintenance costs for stricter wastewater treatment standards for nitrogen and phosphorous. Nationwide, every one dollar spent on source water protection saves an average of 27 dollars in water treatment costs. Utilizing best management practices at the source of excess nitrogen and phosphorous is less costly than expanding wastewater plants to handle additional nutrient loading.

Utah Solutions

The Division of Water Quality conducted exhaustive studies on the economic and ecological effects of nutrient pollution as part of its two-year stakeholder process to develop adaptive management strategies. This resulted in a site-specific rather than a "one-size-fits-all" approach. Proposed strategies include:

- UDAF-sponsored environmental stewardship certification program (ACES) for agricultural nonpoint sources of nutrient pollution to reduce their nutrient loads.
- Technology-based standards for wastewater treatment plants that will result in significant nutrient reductions for an average of \$3.47 per month per household.
- Watershed based approach for nutrient standards that will focus initially on pristine headwaters.
- Adaptive management approach for restoration efforts that prioritizes areas for nutrient reduction projects.

Excess nitrogen and phosphorus in Utah waters adversely impact state rivers, lakes, and streams. The Division of Water Quality (DWQ) has partnered with a team of federal, State, and local stakeholders to develop targeted, Utah-based solutions for the water quality problems associated with excess nutrients.

Nutrient Pollution

Nitrogen and phosphorus are natural parts of the aquatic ecosystem. Both nutrients support life, including algae and the aquatic plants that provide food and habitat for fish and smaller aquatic organisms. However, excess nitrogen and phosphorus, or nutrient pollution, can create serious water quality problems. Nutrient pollution:

- threatens drinking water;
- impairs aquatic life;
- threatens recreational uses;
- poses serious risks to human and animal health; and,
- increases water treatment costs.

Causes

The primary sources of excess nitrogen and phosphorous are often the direct result of human activities. Important human sources include:

- Nitrogen and phosphorus in sewer and septic wastewater systems.
- Fertilizers, yard and pet waste, and certain soaps and detergents that enter urban storm water systems.
- Improperly managed animal manure, excess fertilizer applied to crops and fields, and soil erosion due to agricultural operations.

- Nitrogen emissions from electric power generation, industry, transportation, and agriculture that lead to atmospheric nitrogen deposition in water bodies.

Statewide Water Quality Problem

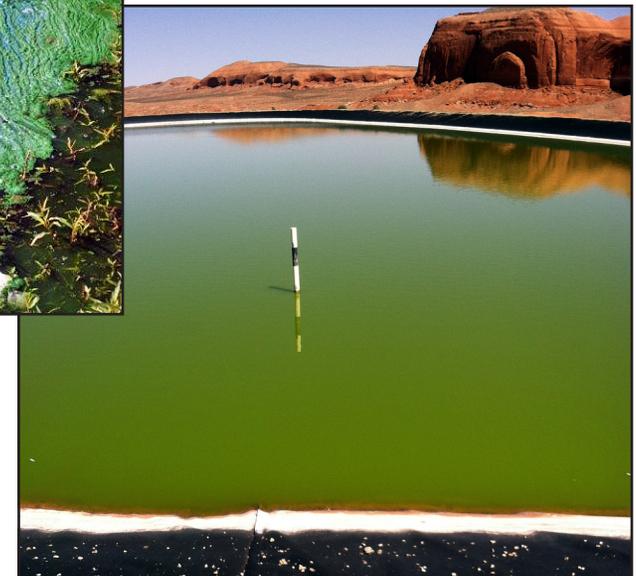
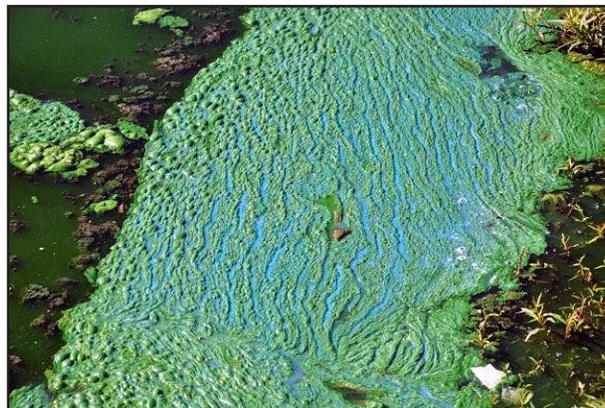
No portion of the state is immune from nutrient pollution. In urban areas, fertilizer use, pet waste, detergents, and stormwater runoff contribute to nitrogen and phosphorous pollution. In rural areas, soil erosion, application of fertilizers on cropland, and septic systems increase nutrients in the water. Wastewater treatment plants discharge nutrients into receiving waters in both urban and rural areas.

Nutrient loading into Utah's waterways will grow as the state's population and economy grows. Addressing the problem now would prevent further degradation of Utah's water resources and reduce the high projected costs for water treatment in the future.

Nutrient Criteria and Nutrient Reduction

Numeric nutrient water quality criteria would establish nitrogen and phosphorous concentration limits that are protective of the beneficial uses of water bodies. These criteria would drive water quality assessment and watershed protection strategies and facilitate priority-setting and efficient program implementation, including easier and more cost effective restoration practices at sites identified by the Division for remediation.

Nutrient criteria development is only one piece of the puzzle. The Division will use a multi-pronged approach to nutrient reduction. Nutrient criteria must be accompanied by reasoned implementation procedures that consider both the socioeconomic and ecological implications of nutrient reduction programs.



Depleted Uranium Performance Assessment Review

In October 2013, DEQ began agency review of the Performance Assessment (PA) for depleted uranium disposal at EnergySolutions's Clive facility in Tooele County.

EnergySolutions requested a license amendment in 2009 that would allow it to accept large quantities of depleted uranium. In response to this request, the Radiation Control Board adopted new rule requirements regarding the disposal of depleted uranium (DU). State rules specifically require EnergySolutions to conduct a site-specific PA to determine if the Clive facility is suitable for the disposal of DU. State rules require a compliance period for DU of a minimum of 10,000 years, with additional qualitative simulations for the period when peak radiation dose may occur.

DEQ hired an outside technical contractor from Virginia in August to help the agency evaluate the adequacy of the EnergySolutions Performance Assessment. The Director of the Division of Radiation Control (DRC) expects to make a determination on the company's request for a license amendment sometime in Fall 2014.

Performance Assessment

A performance assessment (PA) is a quantitative, technical evaluation to determine whether a disposal facility can meet federal and State performance standards to protect public health and safety. It considers:

- potential radiological dose, using appropriate modeling and methodologies, to determine if there is reasonable assurance that the potential dose will be below the regulatory standard;
- the stability of the site during operation, closure, and post-closure, including site conditions, potential pathways for transport of radiological materials, the potential for environmental releases, and disposal depth; and,
- potential radiation exposures from the disposal site to the general public or inadvertent intruders by evaluating different scenarios for exposure;



- performance and institutional control periods sufficient to protect public health and safety.

EnergySolutions Performance Assessment

On June 1, 2011, EnergySolutions submitted a 960-page, site-specific Performance Assessment (PA) that identified critical data, facility design, and modeling procedures for Depleted Uranium (DU) disposal at its facility. The PA analyzed not only the 3,577 metric tons of DU received by EnergySolutions from the Savannah River Site, but also acceptance and disposal of up to 700,000 metric tons of similar depleted uranium waste from the Ohio and Kentucky deconversion plants.

DEQ hired an outside contractor, S. Cohen & Associates (SC&A), to provide technical support to the agency in evaluating the performance assessment and license compliance report. In October 2013, DEQ and SC&A completed a Preliminary Completeness Review of the DU Performance Assessment. SC&A's review report provided general and specific comments on the completeness of the PA based on Utah regulations and guidance documents. The report did not address the technical merits of the PA, only its completeness. The sixty-seven page report identified areas where the text lacked clarity or statements were unsupported by adequate references.

EnergySolutions responded to comments deemed deficient and proposes to respond to the regulatory and technical inadequacies of the modeling portion of the performance assessment in the Round 1 interrogatory phase slated for February 2014.

The Division of Radiation Control (DRC) will use the information from the PA, along with contractor and State agency review of the Performance Assessment, to determine whether the company can provide reasonable assurance of compliance with regulatory performance objectives for the safe management and disposal of depleted uranium.

Tentative Timeline for DEQ Review of the DU Performance Assessment

- **August 27, 2013**
DEQ contracted Virginia-based contractor, S. Cohen & Associates to assist with the evaluation of the EnergySolutions Performance Assessment.
- **October 28, 2013**
DEQ sent its Completeness Review of the DU Performance Assessment to EnergySolutions. The company submitted its response on 11/08/2013.
- **November 13, 2013**
DEQ hosted an Open House to allow interested members of the public an opportunity to ask questions about the review process.
- **Winter 2013-2014**
DEQ sends first interrogatory to EnergySolutions with questions and comments on the PA.
- **Winter 2013**
EnergySolutions deadline to respond to DEQ interrogatory.
- **Spring 2014**
DEQ prepares and sends second interrogatory to EnergySolutions.
- **Spring 2014**
EnergySolutions responds to second DEQ interrogatory.
- **July 2014**
Final Safety Evaluation Report (SER) complete.
- **July 2014**
Public comment period begins.
- **August 2014**
Public Meetings (dates and times TBD).
- **August 2014**
Public comment period ends.
- **September 2014**
Final determination by the Director of DRC on whether or not to issue EnergySolutions a license amendment or a new license application for the disposal of depleted uranium.

Depleted Uranium (DU)

Depleted uranium, a byproduct of the uranium enrichment process, is initially less radioactive than naturally occurring uranium. However, the radioactivity of depleted uranium and its decay products increases rather than decreases over time, posing significant challenges for safe and effective long-term disposal.

Nuclear Regulatory Commission (NRC) rulemaking on low-level radioactive waste (LLRW) in the early 1980's did not anticipate large quantities of depleted uranium waste being disposed in commercially operated disposal sites nor the increase in uranium enrichment activities by the private sector.

A 2008 NRC technical analysis concluded that the safe disposal of depleted uranium was dependent on the geological, hydrological, and climate characteristics of the proposed site. The NRC recommended site-specific performance assessments for depleted uranium to evaluate the waste stream, update and revise assumptions on the behavior of depleted uranium over time, and assess whether disposal will meet public health and safety requirements.

Success Story

Changes in Land Use Practices Improve Water Quality

A little less than 20 years ago, phosphorous runoff into the Cub River and its tributaries had seriously impaired the water quality of the river. Thanks to the cooperative efforts of landowners, producers, DWQ, and the local conservation district, phosphorous levels in the Cub River drainage have been steadily decreasing.

Adoption of new land use management practices by landowners reduced pollution, improved water quality, and revived riparian areas. Over 20 agricultural producers in the watershed made changes to their land use practices to promote sound stewardship of the area's water resources.



A River in Trouble

High phosphorous levels in the Little Bear River led DWQ to designate the river and its drainage as impaired in 1995. A water quality study found that nonpoint source pollution from agricultural practices was a major source of the phosphorous loading responsible for the impaired water quality. Several land use practices contributed:

- Unmanaged livestock grazing in river and creek bottoms damaged riparian areas.
- Improper manure management released pollutants into the river, particularly during spring rains.
- Return flows from flood irrigation discharged excess nutrients from runoff into the Cub River and its tributaries.

DWQ, the North Cache Conservation District, Utah State University, the Natural Resources Conservation Service (NRCS), local landowners, and others teamed up in 1999 to launch the Cub River Water Quality Improvement Project. Partners in this water quality project championed the adoption of best management practices by producers to reduce nonpoint source pollution and the development and implementation of riparian projects to restore the streamside environment. Projects included:

- revegetating riparian areas and rebuilding banks;
- relocating animal feeding operations;
- shifting from flood irrigation to pressurized sprinkler irrigation; and,
- fencing to keep livestock out of riparian areas.

Restoration of Riparian Areas

Livestock producers installed multiple offsite watering facilities to reduce reliance on riparian areas for water. Producers installed over four miles of fencing to prevent livestock from accessing the river and creeks, with several more fencing projects currently in the design phases. Producers have also installed 3,100 feet of pipeline to supply water for livestock troughs away from the river and its tributaries. Improved grazing management has reduced the erosion of grazing areas, reducing sediment

loading from runoff from rangeland and pastures. Stream restoration and rehabilitation projects concentrated on stream bank stabilization and revegetation.



Manure Management

Since 2001, producers have installed ten solid waste facilities and six liquid waste storage ponds on dairies and feedlots and constructed over 600 feet of berms and diversions in areas where livestock are close to water. In two instances, producers relocated operations off the river. Containing runoff from manure bunkers and wastewater lagoons limits the nutrient loading into waterways. Producers also utilize nutrient management plans to determine appropriate manure application rates for their fields.

Improved Irrigation Practices

Flood irrigation creates runoff that washes phosphorous in manure and commercial fertilizers into waterways. Center-pivot spray irrigation systems allow operators to

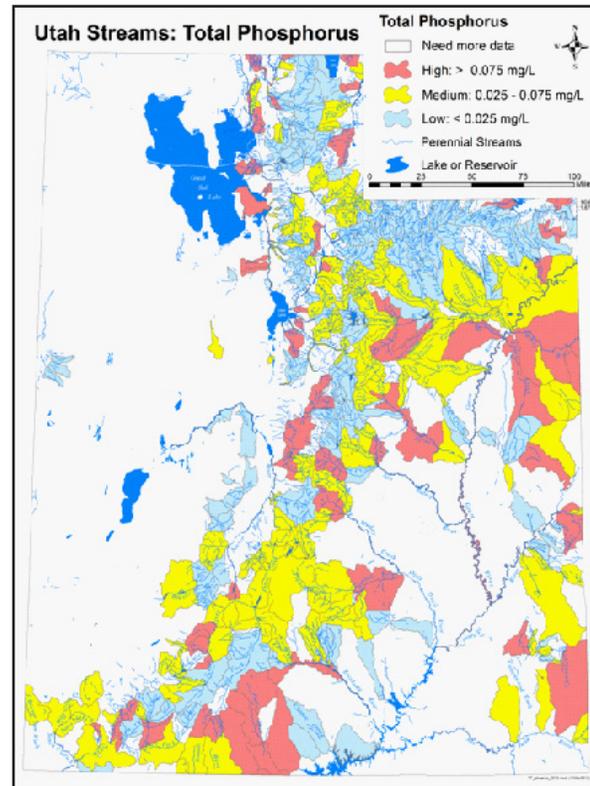
set the timing and amount of irrigation water applied across their fields. Irrigation scheduling prevents the over application of water. This reduces the runoff of sediments and excess nutrients into waterways from irrigation.

Partners and Funding

Collaborative efforts to improve the water quality on the Cub River have yielded impressive results. DWQ supplied monitoring equipment and lab analysis support for water sampling. The NRCS entered into contracts with individual landowners to install BMPs. They also provided planning and engineering support. Utah State University Extension worked side by side with the local conservation districts and NRCS to provide technical support and outreach and educational efforts to raise awareness of water quality issues in the Bear and Cub River watersheds.

Since 2001, NRCS contracts have totaled over \$1,092,000. The Clean Water Act Section 319 program provided an addition \$330,100. Producers provided in-kind matching funds of \$212,400. Together, water quality improvement projects on the Cub River have totaled approximately \$1.9 million to date.

These restoration efforts, combined with increased outreach and education for landowners and operators, have resulted in better land use practices and reduced pollutant loading to the Cub River.



Economic Benefits of Nutrient Reductions in Utah Waters

A study funded by DWQ quantified the economic benefits and costs of implementing nutrient criteria for surface waters in Utah. Surveys administered to Utah households showed that residents place importance on protecting waters from excess nutrients to maintain quality of life and recreation opportunities. The study showed that:

- Ninety-seven percent of Utah households surveyed said that maintaining water quality for future generations was important.
- Utah households report that they are willing to pay from \$70 million to \$271 million a year to protect and improve waters that are threatened by increasing levels of nutrients.

Citizens who visit lakes, rivers, and streams in Utah both stated and showed, through their trip choices, a clear preference for recreating at cleaner water bodies. The study found that annual economic benefits derived from enhancing recreational trips by improving water quality in Utah's waters accounted for about \$48 million of the total economic value. The remainder is due to other quality of life factors, including sustaining water quality for future generations.

Finally, this study estimated that residents of Utah spend about \$1.4 to \$2.4 billion a year on trips to the state's waters for water-based recreation activities, deriving a great deal of enjoyment from the state's water resources as well as making an important contribution to the state's economy.

Consumer Products and PM_{2.5}

Consumer products like hair spray, carpet cleaner, or air fresheners contribute to Utah's PM_{2.5} problem. Many states already have VOC limitations on a wide range of consumer products, mainly to address elevated ground-level ozone concentrations. VOCs are also a major factor in the formation of PM_{2.5}, a reduction in these emissions from household products leads to a decrease in the formation of fine particulate pollution. To address high PM_{2.5} levels in Utah, the Division of Air Quality passed rules reducing VOCs in products sold in the state.

Unexpected Sources

Solvents contained in common products such as paints, varnishes, preservatives, waxes, dry cleaning products, polishes, degreasers, and automotive products have long been known to emit VOCs. New carpeting, backing, and adhesives, wood products manufactured using certain glues, finishes, and waxes, and vinyl type flooring and wall coverings can all release VOCs into the air.

Cosmetics, personal care products, disinfectants, laundry detergents, air fresheners, fabric softeners, dryer sheets, dish detergents, all-purpose cleaners, soaps, hand sanitizers, lotions, deodorants, shampoos, and hair spray contain organic chemicals that release VOCs. While the quick drying solvents in aerosols generate good quality sprays and keep the pressure in the containers constant, they add to the VOC emissions. But prohibiting aerosol sprays doesn't completely solve the problem, because pump sprays and stick deodorants also contain VOCs.

Rulemaking to Reduce VOC Emissions in Utah

In 2013, DAQ passed rules to reduce VOCs from manufacturing and sales of consumer products. The rules established VOC limits requiring the reformulation of some products. These products fall into four categories:

- Auto Aftermarket Products
- Consumer Use Coatings
- Household Products
- Personal Care Products

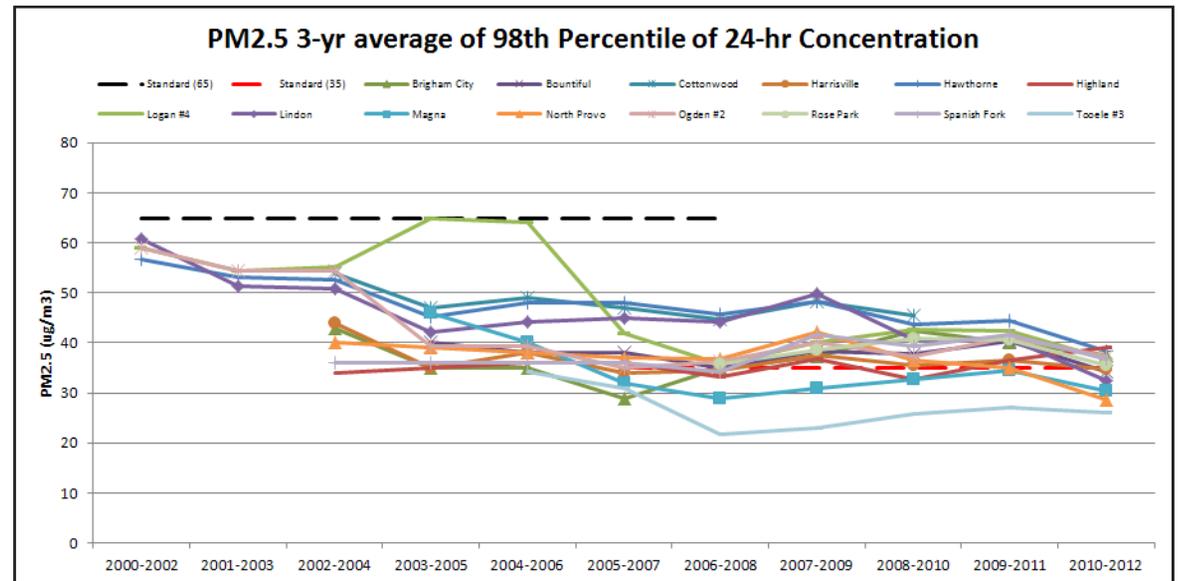
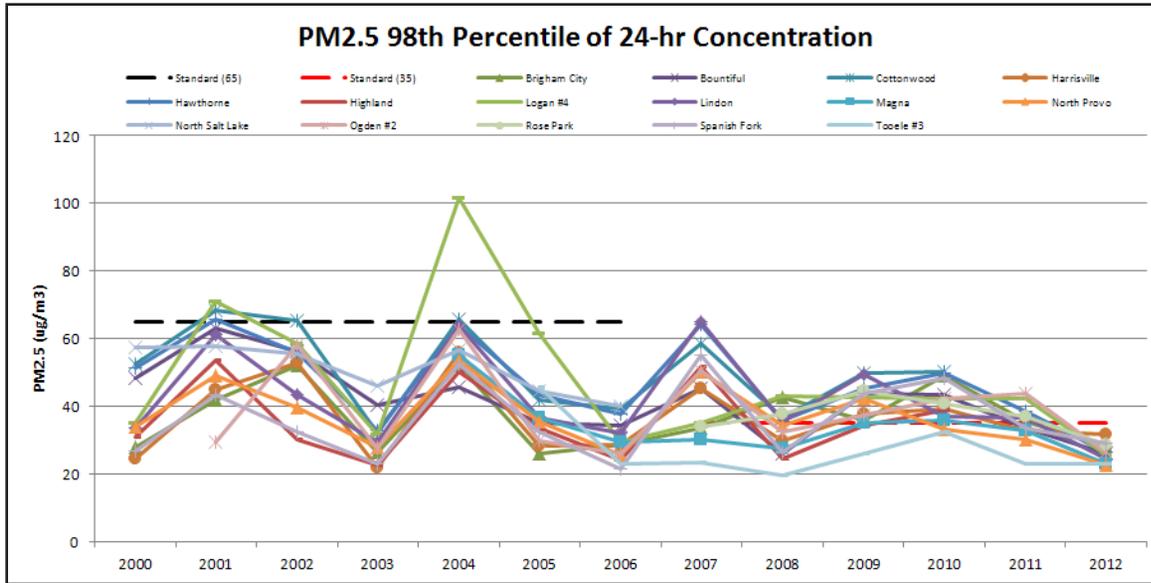
Lower VOCs in these products will provide a reduction of approximately 4,000 tons per year for the counties in nonattainment for PM_{2.5}.

These rules do not ban these products. Products currently on the shelves and in warehouses can still be sold. Products subject to these rules will be required to clearly display the product manufacture date no later than a year before the rules for that particular product go into effect. Manufacturers and suppliers are required to provide only low-VOC product formulations for sale and distribution in the affected counties once the rules go into effect.

What Consumers Can Do

For consumers looking for a way to make more informed purchasing choices, EPA's Design for the Environment (DfE) program screens and identifies products through a stringent scientific review process. Chemical-based products carrying the DfE logo meet strict EPA standards and include all-purpose cleaners, laundry detergents, degreasers, and carpet and floor care products. The DfE Standard for Safer Products incorporates the California Air Resource Board's VOC regulations, which limit the amount of VOCs that can be used in various cleaning product categories. EPA has a list of labeled products located on its Web site.





Pollution control measures include regulation, pollution prevention, best management practices, and enforcement of environmental laws.

Pollution Control

The Department of Environmental Quality implements State and federal environmental laws to protect Utah's air, land, and water. Pollution control measures include regulation, pollution prevention, best management practices, and enforcement of environmental laws.

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Permitting

DEQ issues permits and licenses to businesses, facilities, or individuals that emit, dispose, or discharge contaminants into the environment. Permits and licenses regulate the amount, timing, and manner of these releases. The Department issues permits that cover a broad range of regulated activities, from storm water discharge to solid waste disposal. All permitted activities are subject to comprehensive examination and review by DEQ scientists and engineers to ensure that the operations comply with State and federal regulations for protecting the environment.

Public participation is important to the permitting process. Permit writers at DEQ consider public comments when issuing draft permits and often make changes to permit conditions based on feedback and information they receive from the public.

Jordan Valley Water Treatment Plant

A draft surface water discharge permit issued this year by the Division of Water Quality (DWQ) to the Jordan Valley Water Conservancy District (JVWCD) will protect the waters of the Great Salt Lake and the Jordan River from possible contaminants in the discharge water from the Southwest Groundwater Treatment Plant. While

the permitting process for the project took almost a decade, it provided scientists with the time needed to research potential impacts from plant discharges to these water bodies and establish critical monitoring requirements.

Permit History

The Jordan Valley Water project is a part of a larger groundwater cleanup under a Natural Resource Damage Claim (NRDC) filed in 1986 by the State of Utah against Kennecott Utah Copper. The claim was made for damages to two deep water aquifers from historic mining activities. The Jordan Valley Southwest Groundwater Treatment Plant was constructed under the NRDC settlement agreement to treat contaminated water located in the deep water aquifer in Zone B in the southwestern Salt Lake Valley. Kennecott Utah Copper constructed a similar reverse osmosis facility to clean up contaminated water in the deep groundwater in Zone A.

Jordan Valley requested and received approval in 2003 to discharge byproduct from the reverse osmosis treatment of deep aquifer groundwater into the Jordan River. Jordan Valley later withdrew the permit to study discharge alternatives and to allow for additional time for studies.

In the interim, the Division classified the Jordan River as impaired based on Utah Water Quality Standards for total dissolved solids (TDS). This classification meant the Jordan River could no longer be considered as a discharge recipient for waters that exceed a TDS concentration of 1,200 micrograms per liter (mg/L). In 2008, DWQ completed the Great Salt Lake Selenium Study which established a tissue-based numeric standard for selenium.

In 2010, Jordan Valley submitted a Utah Pollution Discharge Elimination System Permit (UPDES) application requesting to discharge byproduct water into Gilbert Bay of the Great Salt Lake and untreated shallow groundwater to the Jordan River. DWQ hosted a public information meeting and public comment period on the permit application in 2010 and early 2011.

The Division issued a draft permit for the JWVCD plant in May 2013 and held a 45 day public comment period. DWQ considered these comments and expects to issue a final permit in the first quarter of 2014.

Permit Limits

The UPDES permit allows the treatment plant to discharge byproduct water via a 21 mile pipeline running from its facility in West Jordan to the mouth of Gilbert Bay along the south shore of the Great Salt Lake and allows the plant to discharge excess shallow groundwater used in the treatment process into the Jordan River.

The permit limits discharges from the Jordan Valley Southwest Groundwater Treatment Plant to the Jordan River and the Great Salt Lake. These limits are based on existing water quality standards. DWQ adopted a weight-of-evidence approach for discharges to the Great Salt Lake to ensure that the effluent limits in the permit meet the narrative standards for the lake and protect the beneficial uses of Gilbert Bay and its transitional waters.

The public raised concerns about impacts from selenium and mercury in the byproduct discharge. DWQ received an unprecedented number of comments, totaling 150 pages, from 50 individuals and organizations on the draft

permit. On May 9, 2012, DWQ sent a 31-page Comment Response Summary to those who commented on the 2010 draft. After a lengthy review of the comments, DWQ determined it needed to make substantive changes to the 2010 draft permit and Statement of Basis. The permit was revised to include supporting information for the determination of the effluent limits in the byproduct discharge and additional monitoring requirements in the transitional waters of Gilbert Bay for selenium and mercury.

Next Steps

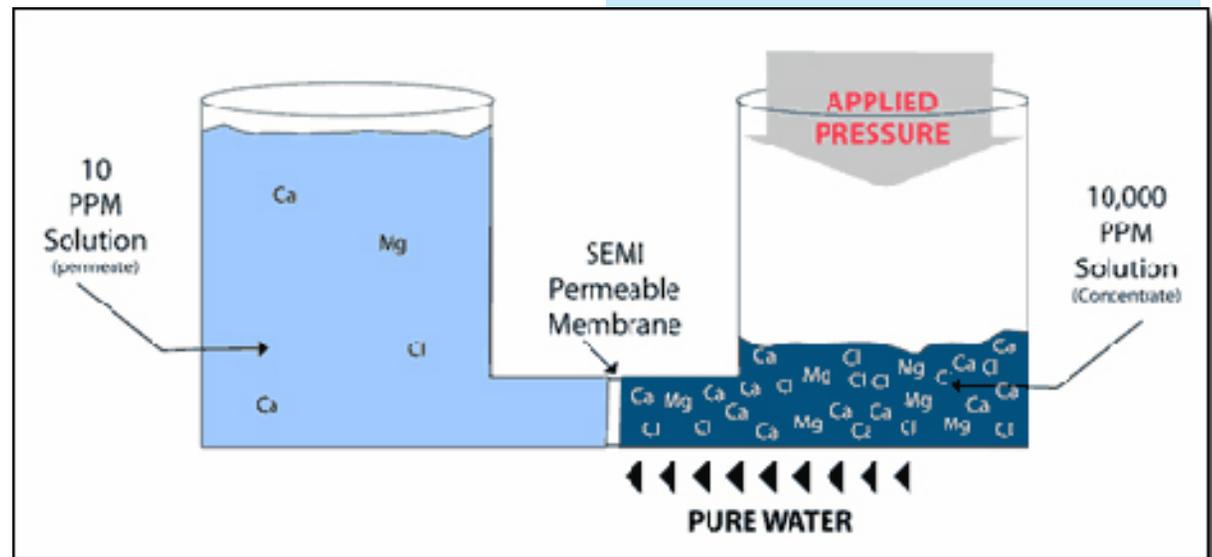
The permit includes a reopener provision if new information resulting from effluent monitoring and study data indicates that DWQ needs to revise these limits. Building in the flexibility to consider new information ensures protection of the water quality resource.

Reverse Osmosis

The cleanup project makes use of reverse osmosis to remove total dissolved solids (salts) from the groundwater. High pressure forces contaminated water through a semi-permeable membrane. The water flows through the membrane while salts, such as sodium chloride, calcium carbonate, and sulfate, are separated from the water moving through the membrane and collected in the byproduct waste stream.

Treatment will result in three streams from the treatment plant:

- Drinking quality water distributed to areas served by Jordan Valley's existing system.
- Excess untreated shallow groundwater that will be discharged to the Jordan River.
- Byproducts from the treatment process, including concentrated dissolved salts and trace metals, discharged to Gilbert Bay in the Great Salt Lake via a 21 mile pipeline.



NOVs Enforce Compliance with State Enviro Laws

The DEQ issues a Notice of Violation (NOV) when a division director has reason to believe that a facility or individual has violated State environmental regulations.

The Notice of Violation and Order to Comply describes findings of fact, identifies violations based on these findings, and issues mandatory compliance provisions based on the findings and violations. It does not establish penalties, but does provide information the division director can use in determining fines. The violator has the opportunity to review the document, submit a response, or challenge the NOV, and submit a response to the compliance order.

This year, DEQ issued NOVs to Chevron for violations of water quality regulations from a diesel fuel spill into Willard Bay, and to Stericycle for violations of air quality regulations from its medical waste incinerator.

Willard Bay

In March 2013, fuel released from a break in a diesel pipeline leaked approximately 21,000 gallons of diesel near Willard Bay Reservoir. The fuel traveled to a drainage ditch connected to the reservoir through a series a wetlands/channel chains and accumulated in the drainage ditch and wetlands, contaminating an environmentally sensitive area in North Willard Bay State Park. Soil, surface water, and groundwater contamination in the vicinity of the spill site required extensive containment and clean-up measures.

Violations

Violations identified in the Notice of Violation and Order to Comply included:

- discharge of a pollutant (diesel) into the waters of the state causing pollution harmful to wildlife, fish and aquatic species, and impairing the beneficial uses of these waters;
- unpermitted discharge of a pollutant; and,
- discharge from a pipeline in a manner that may cause violation of water quality standards and interfere with the designated uses of Willard Bay.

Settlement Agreement

The Division of Water Quality (DWQ) and the Division of Utah State Parks and Recreation negotiated a \$5.35 million draft settlement agreement with Chevron Pipe Line Company for the diesel fuel spill near Willard Bay State Park. The settlement brought closure to the requirements outlined in the Notice of Violation and Compliance Order issued to Chevron in April 2013.

Under the terms of the draft agreement, Chevron agreed to the following terms:

- \$350,000 paid to DWQ as a civil penalty; and,
- \$4,450,000 to fund mitigation projects aimed at improvements in related waterways and facilities. These projects are above and beyond any clean-up actions by Chevron.
- \$550,000 paid to the Department of Natural Resources Division of Utah State Parks and Recreation for lost use damages at the Willard Bay State Park following the spill.

Stericycle

On May 28, 2013, the Division of Air Quality (DAQ) issued a Notice of Violation and Order to Comply to Stericycle for multiple violations of its Title V air quality operating permit.

Violations

The violations identified in the NOV occurred between 2011 and 2013 and included:

- emissions exceeding the permit limits for dioxin and furan;
- emissions exceeding the permit limits for NOx on multiple occasions;
- failure to report these emission exceedances to DAQ in a requisite time frame;
- failure to maintain normal operating conditions during a stack test; and,
- failure to include the test results demonstrating these emission exceedances in the requisite annual and semi-annual monitoring reports.

Stericycle demonstrated compliance with the emission limits contained in its permit as of April 2013, with the penalty accruals for the violations listed in the NOV ending on that date. The Division Director will determine the penalties for noncompliance based on the nature and extent of the violations and the potential for harm from the violations. Violations with a high potential for impact on the public health and the environment are subject to the highest penalties.

Closure of Tooele Chemical Agent Disposal Facility

The Tooele Chemical Agent Disposal Facility (TOCDF) is nearing final closure after 18 years of operation. Since issuing the Part B Permit in 1989, the Division of Solid and Hazardous Waste (DSHW) has provided consistent oversight of the operations of the TOCDF. DSHW ensured that the chemical weapons were destroyed in a manner that protected the environment and health of Utah residents. Inspectors from the Division have maintained a presence at the facility on a weekly basis, with round the clock access to TOCDF.

The military destroyed the last chemical agents stored at the Tooele Army Depot-South (formerly Deseret Chemical Depot) on January 21, 2012. As of October 2012, 95 percent of all secondary waste had been destroyed. TOCDF safely destroyed over 26 million pounds of

chemical warfare agents (GA, GB, VX, mustard, and Lewisite), treated over one million individual munitions items, and treated over 2.6 million pounds of secondary waste.

Decontamination of the facility is complete and the Army has begun verification sampling. Demolition of the facility is scheduled to begin in January of 2014, with final closure documents expected in the summer of 2014. Complete closure of the facility is expected by 2015.

Deseret Chemical Depot (DCD) formally closed July 11. U.S. Army officials transferred DCD's 19,000 acres to the Tooele Army Depot and renamed the area the Tooele Army Depot, South Area, its name between 1969 and 1985.



Major Accomplishments 2013 Division of Solid and Hazardous Waste

- Regulatory oversight for the safe treatment and disposal of 80,001 tons of hazardous waste at Utah commercial hazardous waste treatment and disposal facilities.
- Regulatory oversight for the safe treatment and disposal of 10,889 tons of PCB-contaminated waste at Utah commercial hazardous waste treatment and disposal facilities.
- Comprehensive regulatory inspections at all commercial hazardous waste and commercial solid waste disposal facilities in the state.
- Completion of thirty-five permit modifications for facilities regulated by the Division.
- Evaluated and provided field oversight of two trial burns, at the Clean Harbors hazardous waste incinerator and at TEAD N.
- Conducted compliance evaluation inspections at 49 large quantity hazardous waste generators and 47 small quantity generators.

Nitrates

Nitrates come from nitrogen and are highly water soluble, meaning they can easily migrate through the soil to groundwater. The most common sources of nitrates in rural areas are inorganic and organic fertilizers applied on agricultural lands. High levels of nitrates (above the EPA standard of 10 mg/L) in drinking water wells pose serious health concerns. Since groundwater is the sole source of drinking water in many parts of rural Utah, protection of these drinking water wells is a high priority.

Nitrates in drinking water are particularly harmful to the very young. Infants less than six months of age who drink water with high nitrate levels can become seriously ill with “blue baby syndrome.” The illness causes shortness of breath, a bluish skin color, and in some cases, death.

While it is possible to remove nitrates from drinking water sources through reverse osmosis, ion exchange, and electrodialysis, these treatments are very expensive. Prevention is the most cost effective way to reduce nitrate contamination in aquifers.

Nitrate Mapping Tool

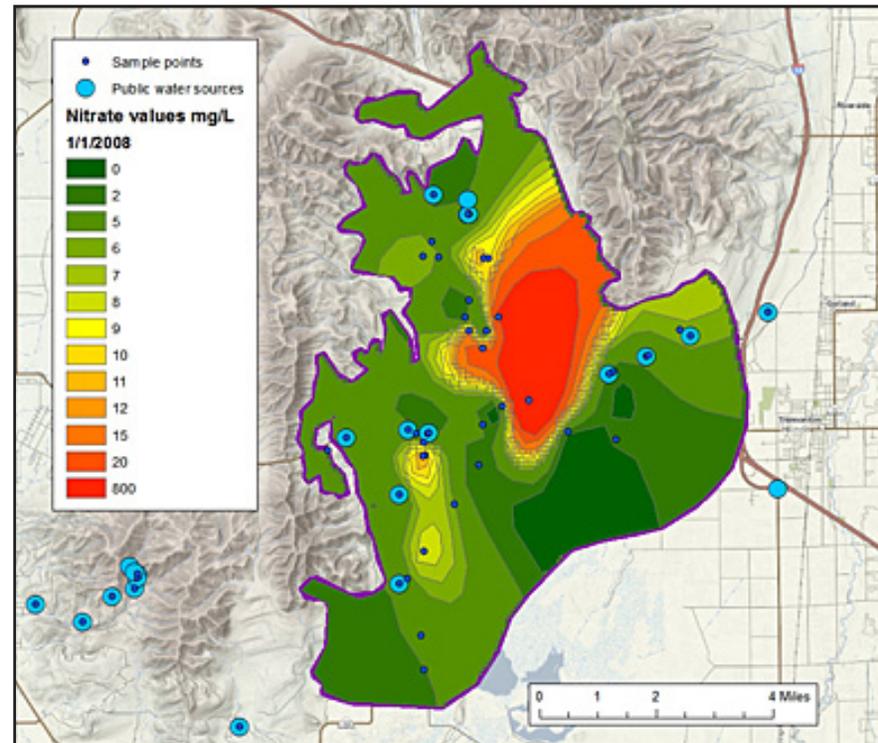
After several drinking water wells in rural Utah were forced to shut down due to nitrate contamination, the Director of the Division of Drinking Water (DDW) asked his staff to launch a Nitrate Initiative. The initiative included development of a tool that could pinpoint areas that show increasing trends in ground water nitrates. DDW, in partnership with the Utah Geological Survey (UGS) and Division of Water Quality, created a GIS tool to correlate increasing nitrate levels in drinking water wells with land management practices that may contribute to elevated nitrate concentrations.

Once areas with high nitrate levels have been identified, Utah State University Extension Services can work with landowners to implement best management practices to protect drinking water sources from contamination.

The GIS mapping tool paired UGS's expertise in geological conditions and geographic mapping with DDW's nitrate sample data. The Division compiled almost 75,000 nitrate samples and combined them with nearly 14,000 samples from the UGS, US Geological Survey, and others for use in this mapping tool. These multiple data sources

provided added spatial and temporal coverage for the state and increase DDW's ability to detect nitrate before it reaches drinking water wells. The Division hopes that early detection will avert well closure and protect water supplies.

The development and use of this GIS tool has attracted national attention, with DDW staff presenting two national Webcasts on the Division's work, one covering the mapping effort and the other highlighting the cooperation between State, federal, and educational stakeholders.



BMPs to Reduce Nitrate Concentrations

The Division of Drinking Water (DDW), Utah Geological Survey (UGS), and Utah State University (USU) are teaming up on a project to determine if voluntary best management practices can reduce nitrate levels in a valley-fill aquifer.

Site Selection

The Nitrate Project team used a data-driven selection method to identify test areas well-suited for the use of voluntary BMPs.

The Division, in coordination with UGS, looked at long-term data from private wells, public drinking water wells, and other wells in the state to determine the best candidates for further review. Using the Nitrate Mapping Tool developed by UGS and DDW, the team organized the data onto statewide maps. They eventually narrowed their focus to three areas where previous studies had identified the sources of elevated nitrate levels.

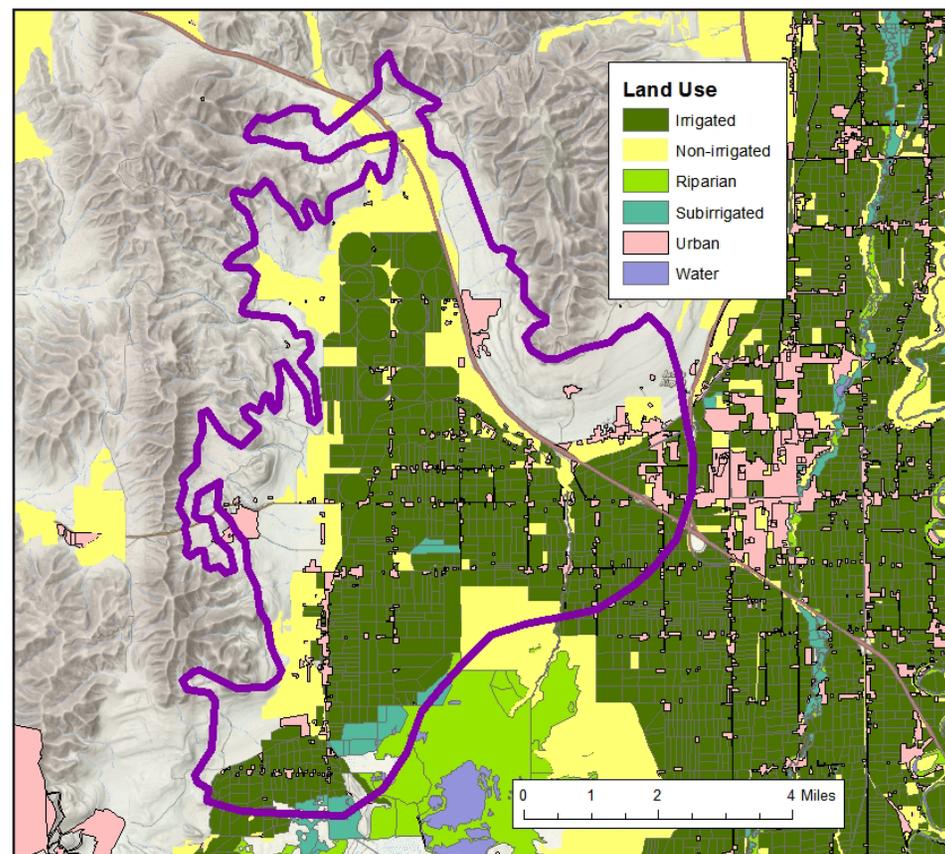
The project team ultimately chose the Bothwell-Thatcher area for further study. Concentrations of nitrate are very high in the center to northeast portion the valley. Elevated nitrate concentrations in the aquifer coincide with an area of irrigated farmland. Records of past activities show that the area of high nitrate has been converted from vegetable farming to commercial sod production.

Next Steps

Although public water supply wells in the Bothwell-Thatcher area have not yet been affected by the elevated nitrate in the aquifer, they will be in the future if landowners continue current agricultural practices. USU will contact local farmers in the high nitrate area to discuss ways they can adjust their fertilizer application rates and irrigation practices to reduce nitrogen levels, in turn

reducing nitrates entering the aquifer. Best Management Practices that control the timing and amount of nitrogen-containing fertilizers can make a significant difference in nitrate levels in the soils.

Once landowners institute these best management practices, the Nitrate Project will monitor the aquifer for nitrate concentrations to discover if management practices successfully reduce nitrates in the ground water.



DWQ Permits Protect Ground Water Resources

Ground water is an important source of drinking water for many Utah residents. Many communities and private individuals in rural Utah drill wells into the underlying aquifers to access ground water. The Division of Water Quality administers two programs to protect these ground water sources from contamination.

Ground Water Quality Protection Program

The water quality protection program safeguards ground water quality through permits to agricultural and industrial waste management units that have the potential to discharge pollutants into ground water. Agricultural waste management units include wastewater lagoons at large concentrated animal feeding operations. Industrial waste management units include ash disposal facilities at coal-fired electrical power plants and wastewater ponds and tailings impoundments associated with ore mining and processing operations for copper, gold, phosphates, oil sands, oil shale, and uranium.

The program has experienced an increase in permit activity for oil sand (bitumen) and oil shale (kerogen) development projects in the Uinta Basin. DWQ recently issued a draft ground water permit to Red Leaf Resources for a pilot project in the Basin for oil shale extraction.

Underground Injection Control Program

The Underground Injection Control Program (UIC) protects underground sources of drinking water (USDW). The UIC Program regulates the permitting, construction, operation, and closure of injection wells to ensure the protection of USDWs from contamination by injection activities.

Injection Wells

An injection well places liquids deep underground into porous rock formations, such as sandstone or limestone, or into or below the shallow soil layer for storage or disposal. Injected liquids include water, wastewater, brine (salt water), or water mixed with chemicals.

Program Administration

The Division of Water Quality (DWQ) administers the UIC Program for Class I, III, IV, and V wells. The Utah Division of Oil, Gas and Mining (DOGGM) regulates Class II wells. EPA Region 8 regulates Class VI wells.

Class III Injection Wells

The UIC Program, in collaboration with DOGM, oversees the drilling and solution mining of several natural gas liquid (NGL) storage caverns under a Class III permit issued to Magnum Solution Mining, LLC in December 2010. The permit includes the creation of several natural gas storage caverns. After the caverns are completed and pass mechanical integrity tests, DWQ will transfer regulatory oversight during operation to DOGM.

The Program is also overseeing the construction of several additional Class III solution mining wells at Intrepid Potash and witnessing the 5-year mechanical integrity testing of the wells at this facility.



Class V Injection Wells

Many Class V well subclasses are authorized-by-rule under the UIC administrative rules because they either do not pose a risk to ground water or they are regulated by other State agencies. These include:

- storm water drainage wells;
- subsurface environmental remediation wells;
- large underground wastewater disposal systems; and,
- ground water sourced geothermal heat pump return wells.

Motor vehicle waste disposal wells are a subclass of Class V wells banned by the EPA. DWQ is working to identify and close these wells.

The UIC Program issues permits for Class V aquifer storage and recovery (ASR) operations to allow municipal water districts to capture spring runoff water and store it in drinking water aquifers for future use. The UIC Program coordinates with DDW and the Division of Water Rights during the permitting process for these well systems.

Currently, Brigham City Corporation and Jordan Valley Water Conservancy District have active ASR projects. The Town of Leamington has a Class V ASR permit but has not yet conducted injection operations. Their permit is up for renewal. The UIC Program granted authorization-by-rule status to a pilot ASR project for Millville City.

The UIC Program collaborates with the Division of Water Rights on geothermal re-injection wells for three geothermal power plants:

- Thermo (operated by Cyrq Energy)
- Cove Fort (operated by Enel North America)
- Blundell Power Plant (operated by Rocky Mountain Power)

Database

The UIC Program has successfully transitioned from existing paper and online reporting mechanisms to electronic reporting through periodic submissions to the UIC National Geodatabase. The UIC database will now be the single source of data to meet EPA reporting requirements. This transition to electronic reporting is a significant change that will improve the effectiveness of the program.



Online Permitting Streamlines Water Quality Permit Process

The DWQ's online permitting system for construction and industrial storm water permitting makes it easy for facilities to apply for new permits and search a database for their existing permits.

The online permit system, pairing the permit application with permit fee payment, has resulted in a direct improvement for administering both construction and industrial storm water permits. Approximately 1,500 new storm water permits are issued each year through the online storm water database system.

DWQ will be expanding its UPDES online permitting capabilities to include other common general permit programs, such as Construction Dewatering, Pesticides Application, and the Utah Sewer Management Program.

Water Quality Permits

DWQ Administers Permits	3,826
Ground Water	37
Surface Water	472
Industrial Storm Water	656
Construction Storm Water	2,261
Operating Permits	58
Large Underground Systems	80

Mammography Inspection Program Protects Patients

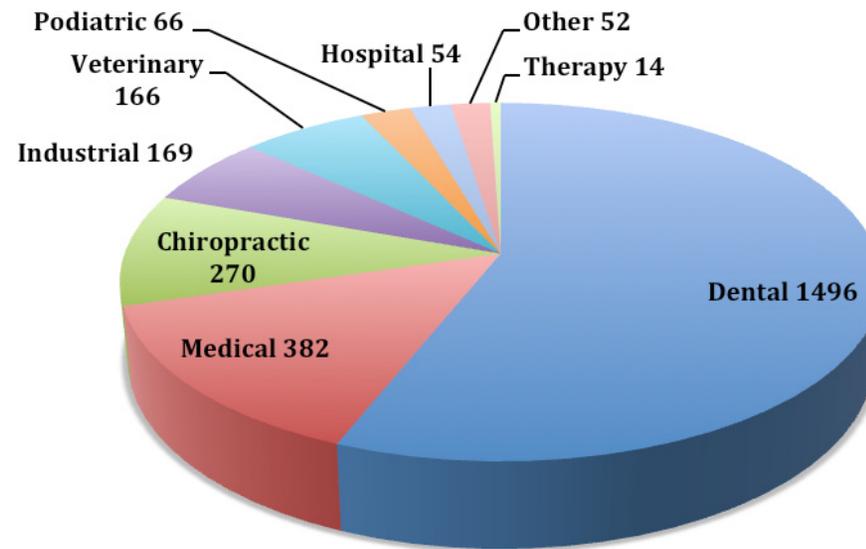
Going in for a mammogram can be a source of anxiety for some women, but thanks to the mammography inspectors at the Division of Radiation Control (DRC), women can be confident that their radiation exposure during the test will be low and their images accurate.

Medical x-rays account for the majority of the average person's exposure to manmade radiation. Under the federal Mammogram Quality Standards Act (MSQA), mammogram facilities are required to undergo periodic review by FDA-approved inspectors to ensure that the staff and equipment meet strict criteria to protect patient health and reduce exposure. All mammogram facilities must be accredited, certified, and inspected.

Mammography inspectors undergo rigorous training to become credentialed by FDA. DRC inspectors have specialized training in radiation physics, the physics of mammography equipment, and MSQA inspection requirements.

Inspections usually take the better part of a day. DRC inspectors begin with an administrative review of the facility. They make sure the facility has the required certificates, examine the quality control test logs, and check to verify that the medical physicist, radiologists, and technicians have proper credentials and are up-to-date on their education requirements. They go over the quality assurance policy for the facility, including consumer complaint and infectious disease control policies. They use American College of Radiology approved "phantom" images to check image quality and accuracy and ensure that technicians using clinical protocols score these

images correctly. Finally, they enter their findings from the inspection onto laptops and upload the information to the FDA for compliance and for evaluation of national trends. Lisa Mechem, a health physicist and one of two mammography inspectors at DRC, enjoys her work. "This position has given me the opportunity to travel the state, assist registrants with compliance, educate them on reducing radiation exposure for workers and the public, and see the varied uses of x-ray in industry as well as medicine."





Leaking Underground Storage Tanks Closure



Safety Klean Storage Tanks.



Red Tags for Underground Storage Tanks.

DEQ provides oversight and technical assistance in the event of an environmental emergency or contamination, offering support for cleanup, remediation, and risk assessment.

Environmental Response

The Department of Environmental Quality provides oversight and technical assistance in the event of an environmental emergency or contamination. The agency offers support for cleanup, remediation, and risk assessment.

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Willard Bay Recovering from Diesel Fuel Spill

A diesel spill in March 2013 sent emergency response crews to Willard Bay to halt the flow of fuel to the reservoir. The Division of Water Quality (DWQ) played a key role in the spill response by monitoring and sampling waters at the spill site and overseeing cleanup and remediation efforts.

First Response

On March 18, 2013, fuel released from a break in a Chevron diesel pipeline near Willard Bay traveled to a drainage ditch connected to the reservoir through a series of beaver dams, channels, and wetlands. The beaver dams captured most of the diesel fuel, but contaminated environmentally sensitive wetlands. The fuel drenched six beavers living in the area. Traces of the diesel fuel eventually found its way to the reservoir shoreline. Soil, surface water, and groundwater contamination next to the reservoir required extensive containment and clean-up measures.

Chevron placed booms approximately 10 feet from the shoreline to contain the diesel and prevent it from entering the main portion of the reservoir. The company placed hard booms and check dams along the drainage

ditch leading to the reservoir and installed underflow dams (weirs) at the north and south ends of the beaver pond. Once it became apparent that the spill had also contaminated shallow groundwater, the company installed a French drain along the beach to intercept diesel in the perched groundwater flowing towards the Bay. Vacuum trucks were deployed to recover the fuel and take it to a refinery for processing. Contaminated soils were excavated and removed.

Sampling & Monitoring

DWQ began water sampling on March 19, 2013. While trace concentrations of diesel-related contaminants (DRO) were detected in water in the treatment area, those concentrations steadily declined after the spill.

Since Willard Bay is a popular destination for sport fishing, there were concerns about possible impacts to fish and health risks to people consuming fish from the Bay. DWQ and the Utah Department of Health did a preliminary evaluation soon after the spill and found no identifiable health risks, since diesel-related contaminants were measured in only trace concentrations in Willard Bay and were expected to break down quickly in the water

following the spill. DWQ and the Utah Division of Wildlife followed up by collecting and analyzing catfish, wipers, and gizzard shad on May 9, 2013. Analytical results showed no diesel contamination to fish from the spill.

Follow Up

On May 3, 2013, Chevron successfully completed hydrostatic testing of the pipeline near Willard Bay State Park and received permission from the U.S. Department of Transportation Pipeline and Hazardous Materials Safety Administration (PHMSA) to place the line back in service under terms of the Corrective Action Order issued to Chevron by PHMSA. The pipeline resumed operations at a reduced capacity on May 4, 2013.

Based on results in a technical report from DEQ, Utah State Parks reopened Willard Bay Park on July 19, 2013 with access controls (such as fencing) to keep the public out of the area contaminated by the spill.

In August, DEQ's contractor collected sediment, soil, and water samples in accordance with the Quality Assurance Project Plan (QAPP) to monitor remediation progress and support human health and ecological risk assessments for contamination from the spill. Sampling found unexpected residual diesel contamination trapped in sediment in an isolated area at the spill site. Chevron removed these soils under DEQ oversight.

DWQ conducted a site visit in late October 2013 to observe remediation efforts to remove residual diesel from the spill site. Workers disturbed sediment to release trapped diesel in the soils and blocked culverts or installed hay bales to filter any solids (TSS) released into the water during remedial activities. Booms and pom-poms collected floating sheen.

Notice of Violation & Settlement Agreement

On April 12, 2013, DWQ issued a Notice of Violation and Compliance Order to Chevron for the diesel pipeline spill. The NOV required Chevron to submit an Incident Response and Cleanup Action Report describing the events leading to the spill, measures to prevent diesel releases in the future, ongoing monitoring of the area, and all future cleanup actions. The NOV also required Chevron to submit a Final Cleanup Report to DWQ detailing the company's cleanup and remediation of the impacted area as well as its establishment of a long-term monitoring program.

DWQ and the Division of Utah State Parks and Recreation negotiated a \$5.35 million draft settlement agreement with Chevron Pipe Line Company on December 17, 2013. The settlement brings closure to the requirements outlined in the Notice of Violation and Compliance Order (NOV/CO) issued to Chevron on April 12, 2013. Under the terms of the draft agreement, Chevron agreed to the following terms:

- \$350,000 paid to DWQ as a civil penalty;
- \$4,450,000 to fund mitigation projects aimed at improvements in related waterways and facilities. These projects are above and beyond any clean-up actions by Chevron; and,
- \$550,000 paid to the Department of Natural Resources Division of Utah State Parks and Recreation for lost use damages at the Willard Bay State Park following the spill.

Next Steps

Chevron continues remedial activities at Willard Bay State Park from the diesel spill. A determination has not yet been made regarding the long-term adequacy of the cleanup in the contaminated area. Plans for the near future include additional sampling and evaluation for human health and ecological risk assessments. These future evaluations will determine if:

- additional remediation is necessary;
- temporary access controls are still needed; and/or,
- the fenced off area is safe for the public.



PCE Plume Added to Superfund National Priorities List

Investigations and reports prepared by the Division of Environmental Response and Remediation (DERR) provided important data and information that led to the Environmental Protection Agency (EPA) decision to place the 700 South 1600 East PCE Plume in Salt Lake on the Superfund National Priorities List (NPL) of contaminated sites in March 2013.

The site is located on the east bench of Salt Lake City, generally within the area bounded by 500 South and Michigan Avenue between Guardsman Way and 1100 East.

Listing on the NPL makes the 700 South 1600 East PCE Plume site eligible for comprehensive assessment and cleanup through the Superfund process. Federal funds will pay for the site investigation and cleanup. NPL listing guarantees that the community will have opportunities for input and involvement throughout the cleanup process.

PCE Contamination

Tetrachloroethylene (PCE) is a synthetic chemical widely used in dry cleaning and metal degreasing. A former dry cleaning facility at the Salt Lake City Veterans Affairs Medical Center is the likely source of the PCE plume.

Sampling and investigations conducted by the state and EPA indicate that ground water at the site is contaminated with PCE. The ground water plume, first discovered in 1990 during routine sampling of the irrigation well for the Mount Olivet Cemetery, contains levels of PCE above state and federal drinking water standards. In 2010, sampling conducted to determine the extent of possible contamination from the 2010 Red Butte oil spill detected additional PCE contamination in natural springs fed by

ground water in the area. Monitoring wells have turned up groundwater concentrations of up to 320 micrograms per liter ($\mu\text{g/L}$) in some areas. The drinking water standard is 5.0 $\mu\text{g/L}$.

When PCE was detected in 2004 in a nearby Salt Lake City municipal drinking water well at levels below this standard, the city chose to remove the well from service as a precaution. The discovery of PCE in natural springs down gradient from the site indicated that the plume was migrating. The contamination now covers approximately 300 acres. If left unchecked, the plume could continue to migrate and put other public drinking water supplies at risk.

Following the 2010 discovery of PCE down gradient of the initial plume, DERR conducted a Preliminary Assessment and Site Investigation under CERCLA authority from EPA. Based on these studies, the U.S. Environmental Protection Agency, with the support of DEQ, the Salt Lake County Health Department, and Salt Lake City, proposed the site for Superfund designation in September 2012. The finalized East Side Springs Site Inspection report confirmed the presence of PCE in the springs and shallow groundwater and concluded the contamination is likely connected to the 700 South 1600 East PCE plume.

Health Concerns

The U.S. Department of Health and Human Services has determined that PCE “may reasonably be anticipated” to be a carcinogen. PCE has been shown to cause liver tumors in mice and kidney tumors in male rats. The two primary exposure pathways from PCE in ground water are:

- drinking water from public and private wells; and,
- potential vapor intrusion into homes.

PCE in ground water evaporates easily, allowing vapors to move through the soil and into buildings through their foundations. Since buildings are not airtight, vapors may enter through cracks in the foundation, gaps around pipes, and other openings. In extreme cases, the vapors may accumulate in homes and buildings at levels that may pose acute health effects, such as nausea.

Typically, chemical concentrations are low or, depending on site-specific conditions, may not be present at detectable concentrations. In residences with low concentrations, chemical exposure over many years may raise the lifetime risk of cancer or chronic disease.

Next Steps

The cleanup process will begin with a Remedial Investigation/Feasibility Study (RI/FS). The study will:

- determine the nature and extent of the contamination;
- determine potential human health and ecological risk;
- identify technologies that could treat the contamination; and,
- evaluate the costs and effectiveness of treatment technologies.

Protection from Drinking Water Contamination

The Division of Drinking Water (DDW) works with water system operators and public health officials when contaminants threaten drinking water systems or sources. This spring and summer, DDW provided technical, engineering, and public health advice when severe flooding, heavy water use, and E. coli contamination jeopardized drinking water supplies.

Emergency Response

Drinking water contamination can occur when:

- harmful bacteria enter the water;
- accidents, power outages, or heavy water use for firefighting reduce water pressure;
- water mains break; or,
- floods wash out drinking water sources.

DDW helps water systems develop and implement emergency response plans when service interruption, cross contamination, or natural disasters contaminate drinking water. The Division also offers boil advisory guidelines to protect public health when drinking water is contaminated.

In 2013, the Division assisted Utah communities with drinking water contamination from a variety of sources.

Flooding

Heavy rains and mud slides washed out spring systems in Pleasant Grove, Manti, Leamington, and Mount Pleasant. DDW advised these water systems on flushing, disinfection, and sampling after mud intrusion compromised their water distribution systems.

E. coli

Lindon and Kaysville showed high E. coli levels in water samples. Water systems issued boil orders for residents until water systems could flush out contaminants. Lindon's bacteriological contamination likely came from cross connections.

Fires

Heavy water use to fight fires near Millville, Hyrum, and Nibley resulted in a drop in water pressure that impacted drinking water.



Corrective Actions

The Division of Solid and Hazardous Waste (DSHW) works with companies through its Corrective Action Program to remediate environmental contamination from the improper storage, treatment, or disposal of solid or hazardous waste. Corrective Actions (CA) ensure that facilities deal with these releases properly to minimize harm to the public and the environment.

Current Oversight

The Division oversees CAs at 12 former or currently permitted treatment and storage facilities:

ATK Launch Systems: Bacchus and NIROP Facility

Major milestones this year included the development of a Corrective Measures Implementation Plan to address the plume of groundwater contamination from ATK's property extending north to Magna. The ATK continued its investigation and remediation of source areas for contamination and cleaned up several sites. DSHW determined they required no further corrective action.

ATK Launch Systems: Promontory Facility

ATK continued its investigation and remediation of source areas for contamination. DSHW is evaluating a number of site investigative reports to determine if additional investigations are needed, remediation is required, or the sites are eligible for no further action.

Big West Oil Refinery

DSHW is developing a corrective action order for the facility. When signed, the CA will provide the framework for investigating the presence or absence of contamination on refinery property.

Chevron Refinery

Historic refinery operations have impacted the upper groundwater aquifer. Chevron operates interception trenches to contain and extract contaminated groundwater. The company also maintains an extensive groundwater monitoring system.

Dugway Proving Ground

Corrective Action at Dugway Proving Ground is complete. The facility inspects and maintains several hazardous waste landfills and monitors the groundwater around them.

Dyno Nobel: Site B

Dyno Nobel completed investigative and remedial work at all contaminated sites on the property and is preparing to submit its final report.

Ensign-Bickford Company

The company completed a multi-year cleanup effort of the former explosives manufacturing plant. A developer working with company plans to develop the site for a mix of residential and commercial properties.

Ninigret Development: Former Engelhard Facility

The developer completed remediation of 400 acres of property and sold parcels of the property to various businesses. Approximately 75 percent of the property has been redeveloped. The developer continues to monitor groundwater at the site to ensure the remedial effort was successful.

Tooele Army Depot (TAD): South Area

TAD made tremendous headway in 2013 in its investigation and remediation of its large munitions storage facility. The facility is also taking interim measures to collect munitions scattered on the ground or in trenches to determine if they require thermal treatment or can be sent off-site as scrap metal. A mobile Explosive Destruction System, currently going through the permitting process, will destroy chemical agent munitions found at the site.

Utah Test & Training Range

The Air Force completed investigation of sites at the facility. Due to the active nature of the range and inherent dangers presented by large volumes of unexploded ordinance, the Air Force will not remediate the majority of sites. The test range will be placed under site management and surrounded by fencing and signs. Security at the facility ensures that the public cannot enter the sites.

Vertellus: Former Reilly Industries Facility

Investigation of the facility property generated information for a risk assessment to determine which portions of the property will require corrective action. SHW staff is currently reviewing this risk assessment.

Westinghouse: Western Zirconium Facility

The facility is developing corrective measures. Western Zirconium proactively addressed a series of leaking wastewater ponds by surrounding the pond complex with a barrier wall. They completed this major undertaking in the fall of 2013. Western Zirconium will focus on other areas at the plant that require corrective action.



Recovered scrap metal from Solid Waste Management Unit 25 at TEAD-S.



Recovered scrap metal from Solid Waste Management Unit 37 at TEAD-S.



Curb and Gutter installation at the Ninigret Development site. New buildings are visible in the background.



The last sheet of plastic sheet pile being installed at Western Zirconium. The plastic sheeting was the second component of the barrier wall around the pond complex. The plastic sheeting was placed into a wall of bentonite (clay) previously installed with heavy equipment.

Performance Audit for the Division of Radiation Control

In 2013, the Division of Radiation Control (DRC) responded to recommendations from a 2012 Legislative Performance Audit by incorporating changes to its current oversight compliance and monitoring program. Lawmakers passed a bill (H.B. 124) during the 2013 legislative session that addressed issues in the performance audit. The Radiation Control Board initiated rulemaking to implement program changes contained in the legislation.

Audit Recommendations

The Legislative Auditor General's Office released a Performance Audit on September 11, 2012 on DRC implementation of its low-level radioactive waste (LLRW) oversight program. Concerns included the degree and method of independent sampling for incoming LLRW prior to disposal at EnergySolutions sampling and independent verification measures for waste classification purposes for LLRW from waste generators.

The report recommendations focused on pre-disposal oversight at the approximately 140 generator sites across the country that ship waste to Utah. State law requires waste generators wishing to dispose of LLRW in the state to obtain a site access permit (Generator Site Access permit or GSA) and comply with all associated laws, rules, and requirements. The Auditor's recommendations sought to expand that oversight to include onsite sampling of waste at generator sites to ensure that waste coming into Utah did not exceed current Class A requirements.

House Bill 124 Radiation Control Amendments

Representative Brad Dee sponsored legislation passed by the Legislature during the 2013 session that amended DRC statutes for the disposal of radioactive waste. The bill:

- Clarified that radioactive waste disposal facility fees deposited into the Environmental Quality Restricted Account (EQRA) could only be used for the costs of administering Radiation Control programs.
- Increased the maximum civil penalty from \$5,000 per violation to \$10,000 per violation for violation of State radiation control statutes and rules.
- Required that radioactive waste generators and brokers shipping low-level radioactive waste to the EnergySolutions Clive facility provide reasonable access to their facility by Division inspectors as part of their approval for access to the Clive facility.
- Established time frames for completeness reviews and reviews of licensing actions for a low-level radioactive disposal facility.
- Authorized the Radiation Control Board to promulgate rules to categorize different levels of applications, setting review time frames with certain tolling provisions.

DRC Implementation of Audit Recommendations

DRC reviewed the audit recommendations and made changes. The Division continues to implement program improvements to DRC activities involving waste classification, verification of LLRW waste, and related areas as noted below.

Predisposal Controls

Site Inspections

The Division of Radiation Control conducts site inspections at EnergySolutions on an almost daily basis.

EnergySolutions notifies the DRC in advance when waste operations occur on a day outside of normal business operations, so DRC can have staff on site. The DRC health physics staff sample selected incoming shipments, such as large components or higher activity Class A waste shipments, with the appropriate survey meters during site inspections.

Waste Characterization

DRC conducts Waste Characterization Plans and observes and validates waste sampling techniques and procedures. In January 2013, the DRC began using an independent software program to enhance waste classification determinations and verifications for incoming shipments to the Clive disposal facility. DRC receives the waste manifests for shipments scheduled to arrive at Clive. Waste shipments are subject to independent review to validate that the waste meets Class A limits as part of the waste transportation and waste acceptance process.

Authority to Conduct On-site Review of Waste to Validate Classification

As of May 14, 2013, DRC requires waste generators and brokers applying for an online Generator Site Access Permit (GSAP) to grant reasonable access to their site for an on-site evaluation by DRC. Permittees applying to dispose low-level radioactive waste at the Clive facility must agree to this requirement.

DRC established a GSAP workgroup within in the division to develop guidance for performing generator/broker site visits. The guidance, combined with rulemaking by the Radiation Control Board, will provide the framework for site visits of waste generators by the DRC staff.

Random Sampling of Containerized Waste

DRC is working with the Radiation Control Board to revise the GSAP rules for on-site visits of waste generators. An informal public comment period will be held in early 2014 for the draft rule changes to the GSAP program. The Board plans to review these comments, revise the draft rule if necessary, and begin formal rulemaking. Following a formal public comment period and additional review and evaluation of any comments received, the Board will adopt the changes or make additional changes, if necessary, for final approval.

Staff Time Dedicated to Predisposal Oversight

DRC devotes significant staff time to predisposal oversight. Health physicists at DRC conduct independent surveys of higher activity Class A waste shipments to ensure they meet Class A requirements. DRC began using a software program in January 2013 to verify waste classification of shipments to Clive. DRC receives weekly reports from EnergySolutions of the two-week shipment schedule for containerized wastes slated for disposal at Clive. DRC uses this shipping schedule to get the necessary information for performing the waste classification verifications.

Random Department of Transportation Inspections of Waste Shipments

DRC conducts site inspections at EnergySolutions on an ongoing basis during normal hours of operation. During FY 2013, DRC staff inspected over 1,900 incoming shipments, representing nearly two-thirds of the total shipments received at the Clive facility.

Waste Attribution

The DRC has discussed waste attribution with the Northwest Interstate Compact on Low-level Radioactive Waste Management (NWIC).

The Compact contacted U.S. Nuclear Regulatory Commission (NRC) staff regarding how important waste attribution is to the NWIC and its ability to exercise exclusionary control of low-level radioactive waste within a compact. The NRC is currently evaluating potential changes to NRC's instructions for completing radioactive waste manifests. Waste attribution to the original waste generator and the ability for the waste manifest to provide and/or support such information is a significant issue to the NWIC and to Utah. The DRC and the NWIC will continue to work with the NRC staff on this particular effort, with particular emphasis on waste attribution.

In March 2012, the DRC notified all holders of GSAP permits that they are required to attribute the source of the waste they ship to Clive. This is especially important for waste processors and waste brokers to provide this information in order to properly identify and attribute the waste to the initial generator.

Greater Governmental Audit Access as a Condition of EnergySolutions' License Agreement

This recommendation rests with the Legislature for its consideration and possible action. DEQ and DRC are willing to work with the Legislature on this recommendation.

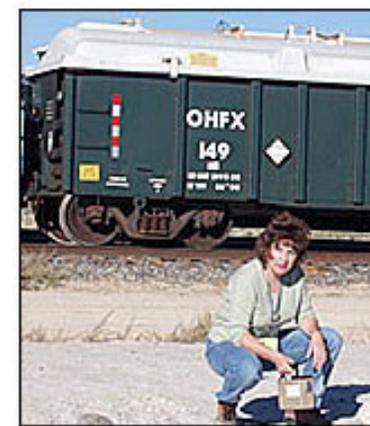
Use of GSAP Revenues

GSAP revenues are managed under the Environmental Quality Restricted Account (EQRA). The radioactive waste program, administered by DRC, and the hazardous waste and solid waste (non-hazardous industrial and municipal) programs, administered by the Division of Solid and Hazardous Waste, provide additional revenue sources that are managed through the EQRA.

H.B. 124 made changes to the Environmental Quality Code and included a provision that radioactive waste and

generator site access fees may only be used for the purpose of administering radiation control programs. This change boosts DRC's ability to use the Legislature's appropriation from the EQRA to support the GSAP program, including predisposal oversight activities of EnergySolutions and the radioactive waste generators and brokers permitted under the GSAP program.

DEQ and the DRC will continue to work with the Legislature on the role of the EQRA in supporting vital radiation control and waste management programs in Utah.



Emergency Planning and Community Right-to-Know

Under the Emergency Planning and Community Right-to-Know Act (EPCRA) of 1986, facilities must report their releases of more than 650 toxic chemicals and chemical compounds to State officials.

EPCRA has four major provisions and objectives:

- **Emergency Planning**
Establish a State and local chemical emergency response planning structure.
- **Emergency Release Notification**
Require the immediate reporting of hazardous substance releases to local and State emergency response agencies, when the release has the potential to impact the public.
- **Hazardous Chemical Storage Reporting Requirements**
Provide—through facility reports—chemical inventory and hazards information to State and local government emergency responders, and to the public, when requested.
- **Toxic Chemical Release Inventory**
Identify the major sources of toxic chemical releases to the environment.

DERR receives EPCRA chemical inventory/storage information reports from facilities throughout the state. This information is available to State and local emergency planning and response personnel and the public through the Tier 2 program.

Toxics Release Inventory

The Toxic Release Inventory (TRI) is a database available to the public on toxic chemical releases that pose a threat to human health and the environment. Facilities that

manufacture, process, or otherwise use these chemicals in amounts above established levels must report how they manage each chemical. A chemical release is emitted to the air or water or disposed on land. The information submitted by facilities to the EPA and states is compiled annually as the TRI and is stored in a publicly accessible database.

Total Releases in Utah

Total on-site and off-site release amounts reported by all facilities reporting TRI in Utah for the current reporting year (RY) decreased by 3.6 percent, from 198.4 million pounds in RY 2011 to 191.2 million pounds in RY2012, showing a net decrease of about 7.2 million pounds in RY 2012.

Releases to Air (On-site)

Total TRI releases to air reported by Utah facilities in RY 2012 decreased by 30 percent, from 11.4 million pounds to 7.9 million pounds, a decrease of about 3.5 million pounds. Chemicals reported in largest quantities were chlorine and hydrochloric acid (aerosol forms only); reported at 4.2 million pounds and 2.1 million pounds respectively.

Releases to Land (On-site)

For the current report year, total chemical releases to land decreased by 1.6 percent. Total releases to land decreased from 183 million pounds to 180 million pounds for a net decrease of 3 million pounds. The largest quantities reported for chemicals were for metals compounds of lead, copper, zinc, barium, arsenic and chromium. Kennecott facilities comprise the largest single-source quantity reported for releases to land. The combined

release reported by Kennecott facilities for releases to land showed a slight decrease, from 168.6 million pounds to 168.2 million pounds.

Releases to Surface Water (On-site)

Total releases to surface water decreased by 79 percent, from 492,000 pounds to 105,000 pounds, for a decrease of 387,000 pounds. The RY 2011 report noted a single large release of 383,000 pounds of nitrate compounds to surface water made by Swift Beef, a facility in Cache County, Utah. A review of the historical data shows this was a one-time release.

It is important to note that the majority of releases include properly permitted activities allowable under federal law.

Toxic Release Inventory Utah RY2012 (Preliminary Numbers)		
Total Releases	RY2012	RY2011
(In Pounds)		
To Air	7.9 millions	11.4 million
To Land	180 millions	183 million
To Water	105,000	492,000

Note: The decrease from the 2013 surface water value reflects a change reported by Swift Beef. In 2011, for the first and only time, Swift Beef reported a release to surface water of 383,440 pounds. With this exception the total release to surface water has historically been in the neighborhood of 90,000 to 100,000 pounds.

Ronald McDonald House Expansion

In early 2013, it looked like the Ronald McDonald House Charities (RMHC) would have to put its expansion plans on hold after contractors discovered gasoline contamination on property slated to house its new 38,000 square foot facility. The Division of Environmental Response and Remediation (DERR) assisted RMHC by facilitating the installation of a vapor barrier so construction could proceed.

A Tradition of Caring

For families across the Intermountain West, the Ronald McDonald House is a place to call home when a child is seriously ill or injured. Since opening its Salt Lake facilities in 1988, RMHC has provided thousands with comfortable, affordable accommodations while a child is in the hospital or receiving extensive medical care. Demand, however, outstripped RMHC's resources. In 2012, it turned away 588 families because it could not accommodate them.

Unexpected Setback

In 2005, RMHC purchased the Sinclair gas station located next to their current building. RMHC leased the station back to the operator under the condition that he remediate the site at the conclusion of his lease, since older underground storage tanks (UST), such as those found under the Sinclair station, could potentially leak into the soil and groundwater.

Although the operator agreed to this remediation, he left town before his lease expired. RMHC accepted responsibility and hired environmental contractors to remove the station and underground storage tanks and perform site remediation. Certified samplers took soil samples at the site. DERR inspected the site and issued "no further action" (NFA) notices based on the soil sampling

and assessment of the soil and groundwater pathways for contaminants on the site. Following receipt of these NFAs, RMHC obtained the necessary funding and clearances to begin construction of its new facilities.

While excavating for a footing for one of the walls, contractors unearthed an old residential oil tank and found contaminated soil located more than 20 feet below the ground level. The residential oil tank had probably provided oil for the houses that occupied the property around the turn of the twentieth century. Although the tank was empty, contractors found soil containing high levels of gasoline contamination at this location. Apparently, gasoline from one of the excavated UST systems had leaked and traveled along piping trenches and fill material to the oil tank and collected there. Because the oil tank was located at a greater depth than the shallow lines of the known UST systems, it had escaped detection.

Sampling results for the deeper soil beneath the oil tank indicated high benzene levels, probably from the former gasoline UST system. While benzene evaporates quickly when exposed to air, it breaks down more slowly in soils and water. Exposure to benzene can cause serious health effects, particularly for sensitive populations.

Total site remediation to remove all possible benzene on the property was impractical and prohibitively expensive. RMHC came close to abandoning the project as costs mounted and a solution seemed nowhere in sight.

Vapor Barrier a Win-Win Solution

RMHC approached the environmental scientists in the UST Branch in DERR for assistance. Scientists' and engineers' in the Leaking Underground Storage Tank (LUST) Branch review and establish cleanup guidelines, defined the degree of hazard, and took action to abate the

hazard and remediate the site. DERR staff scientists and engineers provided guidance and oversight of the cleanup efforts to ensure that cleanup actions were protective of public health and the environment.

DERR scientists and RMHC's consultant, IHI, determined that it would not be feasible to remediate the property to the entire depth of the contamination and keep the RMHC expansion on a reasonable timetable. So the contractor removed only the contaminated soils around the tank, and backfilled with clean soil.

Solution

The extent of benzene contamination beneath the building's footprint was unknown. Placing a facility above potentially contaminated soils could lead to benzene vapor intrusion into the building, since vapors trapped below could eventually migrate to the surface and enter through the foundation. RMHC needed a way to protect the residents in the new facility from potential vapor intrusion.

The solution was to install a vapor barrier and passive venting system in the foundation of the new building. Since this type of ventilation system is most effective when integrated into new construction, the timing was ideal. After the RMHC contractor installed the vapor barrier, construction continued as planned.

Construction on the new facility has proceeded smoothly. RMHC will conduct periodic indoor air testing and water monitoring at the site to protect the health and safety of the residents of the Ronald McDonald House and the surrounding neighborhood.

Environmental education and public outreach are critical to the success of agency programs to reduce pollution and protect public health.

Education and Outreach

Environmental education and public outreach are critical to the success of agency programs to reduce pollution and protect public health. Public participation and input are a vital part of the agency decision making process.

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DEQ Partners with Local Health Departments

All Local Health Departments: Lean Six Sigma Process Improves Efficiencies in Drinking Water Sanitary Surveys

DEQ, along with local health departments and other stakeholders, used the Lean Six Sigma process to identify ways to improve the sanitary survey process.

Sanitary surveys are periodic inspections of public drinking water systems. These inspections ensure that systems are operating properly and do not present a public health risk. Sanitary surveys are conducted either by Division of Drinking Water personnel, Utah Department of Environmental Quality District Engineers, local health officials, Forest Service engineers, or other qualified individuals.

Lean Six Sigma is a powerful management strategy that improves efficiency and eliminates waste. Many businesses use the Lean Six Sigma process to boost performance and effectiveness.

The Department of Environmental Quality hosted a three day Kaizen event with water system operators, local health departments, DEQ district engineers, the Rural

Water Association, and the Division of Drinking Water. Stakeholders attending the Kaizen sessions discussed ways to improve the sanitary survey process.

The group mapped out current sanitary survey procedures to identify bottlenecks, inefficiencies, and redundancies. Using that information, the group developed recommendations and methods for their implementation.

DEQ/LHD Partnerships

Communication and cooperation are the cornerstones of the successful partnership between DEQ and the twelve local health departments. DEQ and LHDs work together to meet mutual goals and objectives for protecting public health and the environment, establish measures for success, and coordinate areas of responsibility.

Local health departments often work the front lines to ensure proper solid waste management, wastewater management, and safe drinking water management within their jurisdictions. DEQ appreciates the opportunity to work closely with LHDs on projects that benefit Utah's environment.

The Department of Environmental Quality (DEQ) and the twelve local health departments (LHD) play a critical role in protecting Utah's environment. DEQ and LHDs work together on a variety of issues that impact public health, including I/M programs, lead and asbestos abatement, solid and hazardous waste, used oil, underground storage tanks, sanitary surveys, onsite (septic) wastewater systems, storm water, and mercury.

Bear River Health Department: DAQ Assistance Facilitates Implementation of New I/M Program

The Bear River Health Department and Division of Air Quality (DAQ) collaborated on implementation of an I/M program in Cache County to meet emission reduction requirements in the PM_{2.5} State Implementation Plan (SIP). DAQ staff support, consulting, and guidance helped Cache County set up its inspection program in a record six months' time.

The Division acted as the technical advisor for the Health Department, relieving them of the costs for an outside consultant. DAQ designed the program to achieve emissions reductions required in the SIP. The Division also assisted Bear River Health in the development of a Request for Proposal (RFP) for prospective vendors for the new emission inspection program, ensuring that the RFP specified the appropriate hardware and software needed to implement the I/M program.

DAQ funded development of a face-to-face and online training program to train and certify technicians for the new I/M program by the National Center for Automotive Science and Technology (NCAST) at Weber State. The Division also provided content for the I/M inspector training manual and funded its development through NCAST.

The I/M program inspections began in Cache County on January 2, 2014.

Tri-County Health Department: Joint Messaging Keeps Public Informed During High Wintertime Ozone Episodes

The Tri-County Health Department and DAQ teamed up to improve public awareness of the health risks from wintertime ozone in the Uinta Basin. DAQ added real-time monitoring data for ozone and PM_{2.5} levels in Duchesne and Uinta Counties to its Web page and mobile app so residents can check pollution levels and find out if there are any accompanying health alerts. Three day forecasts provide residents with information on pollution trends and help them plan their activities accordingly, particularly if they have respiratory ailments that worsen as pollution levels increase.

DAQ provided the local newspapers with a series of educational articles on wintertime ozone and steps residents could take to protect themselves and reduce the emissions that contribute to the formation of ozone. Research teams have spent the past four winters in the Basin looking at the chemical and meteorological causes of elevated ozone concentrations during winter inversions.



Davis County Health Department: New Wastewater Rule Provides Flexibility for Local Health Departments

Davis County Health was instrumental in the development of a new DEQ wastewater regulation that paved the way for the use of alternative wastewater systems for properties for which conventional onsite (septic) wastewater systems proved unfeasible.

The new rule allowed local health departments (LHD) to administer an alternative systems program. This regulation, which went into effect in 2013, gave local health departments the authority to accept applications for variance requests for conventional onsite wastewater systems. LHDs could grant or deny these requests based on the circumstances surrounding the property in question, so long as the alternative system would provide equal or greater protection of public health and the environment.

New App Makes Air Quality Information Accessible

The Division of Air Quality (DAQ) teamed up with students from Weber State University in 2013 to develop a free smartphone app that delivers real-time air quality information. The UtahAir app, a cooperative effort between DAQ and the National Center for Automotive Science and Technology (NCAST) at Weber State, displays ozone and fine particulate (PM_{2.5}) data collected by DAQ air monitors around the state in an easy-to-use format for Android and iOS system phones.

The app includes:

- real-time levels of fine particulates and ozone in nine areas of the state;
- DAQ's new air quality action alert system for voluntary or mandatory actions when pollution levels are high;
- color coded health guidance from EPA's Air Quality Index;
- three-day forecast; and,
- five day trend charts.

Residents can use this information to make informed decisions that will protect their health and reduce personal emissions on days when the air quality is poor. Advisories on the action alert system offer ways to minimize emissions on voluntary action days and identify activities prohibited on mandatory action days. Three day forecasts help the public plan their travel and work schedules based on projected pollution levels during summer ozone and winter inversion periods.

The new UtahAir app has proven to be very popular. Over 10,000 people have downloaded the app since its debut in November 2013.



National Center for Automotive Science & Technology

The National Center for Automotive Science and Technology (NCAST) at Weber State University partners education, industry, and government to improve understanding of vehicle emissions, advanced emission control technology, and fuel and transportation issues. NCAST provides national and local onboard diagnostic (OBD) training sessions for inspection and maintenance (I/M) administrators and community college instructors and a national OBD information clearinghouse. The Center offers a database and SFTP (file transfer) hosting service that allows state transportation and air quality planners to share mobile emissions modeling information and emissions inventories directly with national, state, and transportation organizations. NCAST developed a database and Web-based software application to collect, track, maintain, and analyze DAQ's asbestos and lead-based paint programs and continues to provide support and hosting services. Joe Thomas, section manager for DAQ Mobile Sources, is the director of NCAST.

New Air Quality Alert System

The Utah Division of Air Quality (DAQ) unveiled a new air quality alert system in November that notifies the public when to take action to protect their health and when to take action to improve air quality. These action alerts are a proactive approach to air quality. DAQ isn't waiting until pollution levels reach unhealthy levels to issue calls for voluntary or mandatory actions to reduce emissions.

Health Guidance

The EPA's national standard Air Quality Index (AQI) is divided into six color-coded categories that correspond to different levels of pollution and related guidance for individuals with health concerns. The AQI helps individuals understand the potential health effects they may experience when breathing polluted air.

Air Quality Index (AQI) Values	Levels of Health Concern	Colors
<i>When the AQI is in this range:</i>	<i>...air quality conditions are:</i>	<i>...as symbolized by this color:</i>
0 to 50	Good	Green
51 to 100	Moderate	Yellow
101 to 150	Unhealthy for Sensitive Groups	Orange
151 to 200	Unhealthy	Red
201 to 300	Very Unhealthy	Purple
301 to 500	Hazardous	Maroon

Action Alerts

Three simple symbols notify the public when air quality conditions require unrestricted, voluntary, and mandatory actions. The Air Monitoring Center (AMC) at DAQ determines alert levels, which include actions to reduce air pollution, based on current and projected PM_{2.5} levels.

Unrestricted Action



- Use of solid fuel burning devices, including wood and coal burning stoves and fireplaces, is allowed, but visible emissions must meet air quality regulations.

Voluntary Action



- Voluntarily refrain from using solid fuel burning devices, including wood and coal burning stoves and fireplaces and reduce or stop open burning, including fire pits, fire rings and campfires.
- Use TravelWise trip reduction strategies.
- Optimize industry operations to minimize air pollution emissions.

Mandatory Action



- Do not use solid fuel burning devices, including wood and coal burning stoves and fireplaces. Do not engage in open burning, including fire pits, fire rings and campfires.
- Use TravelWise trips reduction strategies.
- Optimize industry operations to minimize air pollution emissions.
- When mandatory restrictions are in place, solid fuel use may result in penalties ranging up to \$299 per day.

Radon Program Gets Legislative Boost

High radon gas levels in homes, schools, and other buildings pose a serious threat to Utah residents. The State legislature passed a concurrent resolution during the 2013 session that urged key stakeholders, including business owners, homeowners, schools, realtors, home inspectors, the medical establishment, and the media, to spread the word about the dangers of radon exposure and the steps people can take to protect themselves.

DRC Indoor Radon Program

The Division's comprehensive Radon Program covers all aspects of radon testing, mitigation, and training. The program focuses on five key areas:

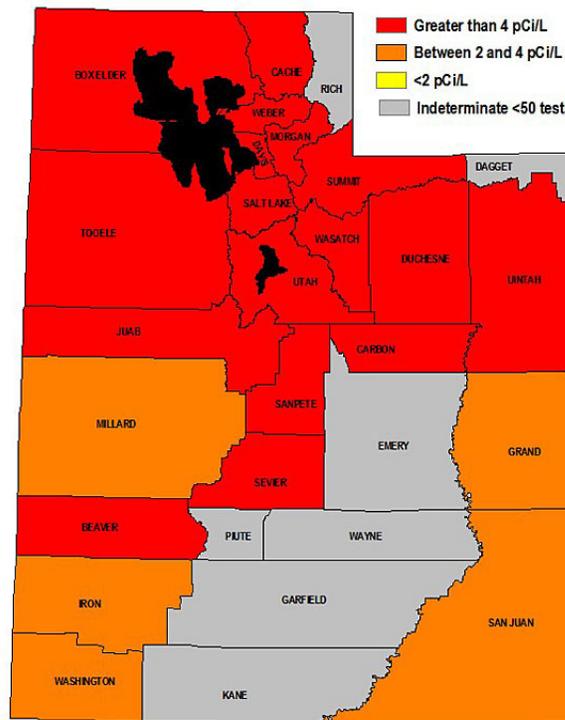
- **Radon Awareness**
Including access to low cost testing.
- **Radon Mitigation**
- **Radon Resistant Construction**
Through partnerships with general contractors and Habitat for Humanity.
- **Public Outreach and Coalition Building**
With local governments.
- **Public School Testing**
- **Continuing Education for Realtors**
On radon testing and mitigation.

Governor Herbert declared January 2013 as Utah Radon Action Month in recognition of the importance of radon testing and education statewide.

Testing

Testing for radon is simple and easy. There are several options for testing for radon:

- Hire a certified measurement provider.
- Purchase a reliable do-it-yourself, short-term test kit (minimum 48 hours).
- Purchase a reliable long-term test kit (90 to 365 days).



Utah Radon Zone Map

Radon

Radon is a radioactive gas that comes from the natural breakdown of uranium in soils, rocks, and water. The gas moves up through the ground and enters buildings through cracks in their foundations or spaces in basement walls. Buildings trap the radon gas inside. According to the U.S. Environmental Protection Agency (EPA), exposure to unhealthy levels of radon in homes is responsible for an estimated 20,000 deaths per year from lung cancer in the United States.

Approximately thirty-five percent of the homes in Utah have radon levels in excess of EPA's recommended action level. Testing is the only way for homeowners to determine whether or not their house has elevated radon levels.

Radon Tests and Mitigations 2013

Tests	7,418
Mitigations	1,256

Training Ensures Compliance with UST Regulations

Operator training in leak detection and leak prevention resulted in a 90 percent compliance rate at underground storage tank (UST) facilities in Utah, up from 83 percent before the program began. The Division of Environmental Response and Remediation (DERR) launched the training program in January 2012 to meet operator requirements under the Energy Policy Act of 2005. Compliance rates will improve going forward as operators put their training into practice at their facilities.

Operator Training Requirements

Federal law requires each UST facility to have a trained and registered operator. Trained operators perform weekly status checks, monthly inspections for leaks on tanks and piping, and monthly inspections of the physical condition of equipment. Operators must report suspected releases to DERR within 24 hours. These regular inspections reduce the likelihood of unintentional releases from tanks.

There are three categories of trained operators. One individual can act as the Class A, B and C operator for an UST facility. Class A operators are responsible for meeting the broader aspects of the statutory and regulatory requirements necessary to operate and maintain the UST system. Class B operators perform the routine daily aspects of operation, maintenance, and record keeping for UST systems, including:

- ensuring that an on-site operator inspection of each facility is performed every 30 days;
- ensuring that the UST system is monitored every seven days for leak detection alarms, etc.; and,
- being present for DERR compliance inspections, or designating another individual to attend.

A Class C operator is an employee who is generally the first line of response in the event of an emergency.

Class A and B operators must complete an approved training course and pass an approved registration examination. Operators may pass a nationally-recognized UST operator examination instead of taking a training course. Class A and B operators may be required to retrained if their UST facilities are found to be out of compliance.

Next Steps

The Division anticipates that operator training and improved compliance with UST requirements will result in:

- fewer releases;
- earlier detection of releases; and,
- reduced liability for releases for tank owners, the PST Fund, and private insurance providers.

Increased attention to leak prevention and leak detection along with proper equipment maintenance and frequent inspections are important ways to reduce tank releases. Improved compliance during the first year of the program demonstrates the value of operator training. DERR will continue to monitor compliance trends attributable to the training program.



Spill Information Now More Accessible to the Public

The Division of Environmental Response and Remediation (DERR) launched a new Web-based database in 2013 that gives the public access to information about environmental incidents in their communities.

The public portion of the Environmental Incidents Database shares information about incidents through a Web page on the DEQ Web site. The database includes:

- date and location of the incident;
- responsible party;
- material spilled;
- impacted media (soils, water, air);
- agency providing oversight;
- response actions; and,
- closure details.

This database gives the general public the ability to track cleanup progress and pinpoint the location of recent incidents.

DERR tracks environmental incidents through a 24 hour call-in number (801-536-4123) and distributes an initial notification report to the appropriate agency for review and incident response. Access to database information helps agencies better respond to environmental incidents in their jurisdictions. Regulatory agencies providing primary oversight over incidents can also update site cleanup progress and incident closure information on the database.



Training Screencasts Help Water Systems Operators

The Division of Drinking Water (DDW) is offering online training screencasts to water systems operators to help them stay current on their water certifications. Operators can receive Continuing Education Units (CEUs) for watching the videos and passing a short quiz. The screencasts also guide operators through complicated EPA rule changes to ensure they are in compliance with new drinking water regulations.

Online Training Available 24/7

DDW developed these screencasts in part to reach water systems operators in remote rural areas. Many rural water systems service very small populations and their operators live many miles from testing centers. These training screencasts are available to anyone with access to the DDW web site, cutting travel and associated costs with certification and recertification. The videos are 30 minutes or less and include a short quiz at the end.

Next Steps

DDW will expand their training screencast offerings throughout 2014. The Division plans to develop emergency training screencasts to provide operators with on-the-spot information in the event of an emergency situation or water contamination. New videos explaining rules changes will be ongoing.

Response to the screencasts has been overwhelmingly positive, with 3,143 visits in 2013.

Recycling Program Streamlines Services

The Division of Solid and Hazardous Waste (DSHW) recently consolidated its recycling programs to form the Recycling and Community Outreach Program. Blending these programs will improve public outreach and expand DSHW assistance services to include hazardous waste generation and recycling education. This new arrangement combines programs for used oil recycling, waste tires, conditional exempt and small quantity hazardous waste generators, and general and electronic waste recycling.

Used Oil

Through extensive public education and outreach, the Used Oil Program makes it easier for do-it-yourselfers (DIYers) to properly dispose used oil. Over 400 locations throughout the state accept used oil, many of them private companies that have registered with DSHW as collection centers. A reimbursement program provides financial incentives for businesses collecting and recycling used oil. The program provides basic used oil and pollution prevention training for businesses, community groups, professional organizations, and schools, along with short videos that explain how and where to recycle used oil.

Waste Tires

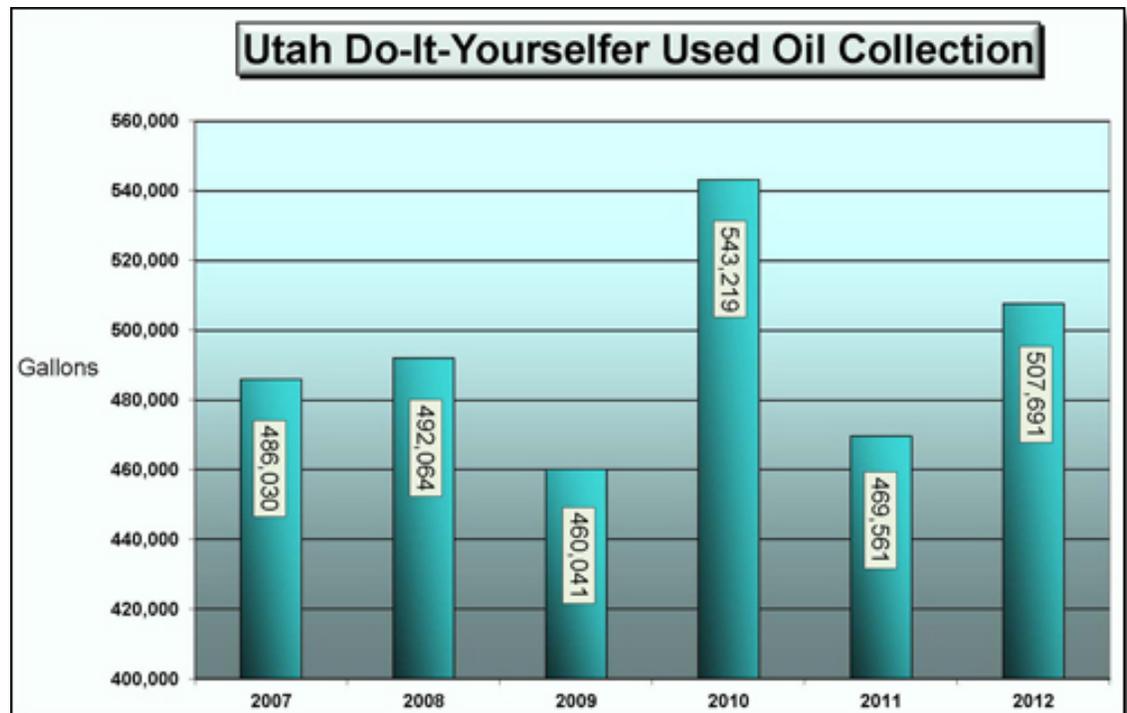
The Waste Tire Program oversees the storage, disposal, and recycling of waste tires to reduce health and safety hazards, decrease the number of tires in landfills, and encourage the tire recycling industry. The Waste Tire Recycling fund provides partial reimbursement of the cost of transporting, processing, recycling, and disposing of waste tires. Since program inception in 1991, tire recycling has increased dramatically. Utah generates approximately 2 million waste tires a year, most of which are recycled or processed within the state at six registered tire recyclers.

Small Waste Generators

The Division provides an outreach program for small businesses that generate less than 2,200 pounds of hazardous waste per month. This program has helped small businesses understand the requirements for compliance with hazardous waste management rules. Each year DSHW conducts compliance assistance visits or compliance evaluation inspections for approximately 150 companies through this program. The Division also provides basic hazardous waste training for businesses and presentations on hazardous waste management and pollution prevention for schools and community groups.

Electronic Waste Recycling

The electronic waste (e-waste) recycling program promotes proper recycling of electronic waste. E-waste is one of the fastest growing waste streams in the country. The DSHW program seeks to increase electronic waste recycling drop-off sites throughout the rural portions of the state as well as ensuring that e-waste is being managed properly at electronics recycling locations. The program Web page contains a list of electronics recyclers throughout the state for businesses and households recycling their old electronics.



Public Participation

Public participation is vital to effective environmental decision making. The Department of Environmental Quality, as part of its charge to protect and enhance the environment, provides the public with ongoing opportunities for input and discussion on agency actions.

Public Comments

DEQ issues public notices, provides public comment periods, and holds public meetings and public hearings to engage residents in the decision making process. The Department posts notice of issues open for public comment on the Utah Public Notice Web site, division Web pages, and the agency-wide public comment calendar. DEQ also provides free e-mail notifications of meetings, permits, plans, programs, and issues. The agency posts in-depth Web content for larger projects to ensure the public has sufficient information on which to base their comments.

How to Submit Effective Comments

DEQ considers public comments during its decision-making process and compiles comment response summaries for issues that generate a high degree of public interest. The agency makes changes, if appropriate, to permits, plans, and rules based on public comments it received. Substantive comments are more effective than general statements of support or opposition for a proposed rule, plan, or permit. Detailed comments that address specific issues or assumptions provide the agency with information it can take into account in its decision-making.

The most effective comments:

- request actions the agency has legal authority to make; and,
- provide new information the agency has not yet considered.

DEQ makes determinations based on sound reasoning and scientific evidence, not on the number of comments it receives supporting a particular position. A single, well-supported comment may carry more weight than a thousand form letters.

Comments requesting that a rule be made more stringent than a corresponding federal rule should also consider commenting that the federal rules are not adequate to protect public health and the environment.

Effective Comments

- Clearly identify the issues;
- support claims with substantive data, facts, or expert opinions;
- suggest alternatives;
- cite examples of the positive or negative impact of the proposed rule; and,
- include economic effects of rules that include quantitative and qualitative data.

Ozone Video Contest

To kick-off its summer ozone campaign, DEQ asked residents to submit a 30-second public service announcement for a Summer Ozone Video contest to:

- involve people in the creation of the message;
- educate them on the ways they can reduce emissions and protect their health; and,
- provide them with a means to share their message with others.

DEQ received videos that encouraged energy conservation, suggested alternative transportation, and let young children explain what they were doing to keep the air clean. More than 500 people participated in the online voting. The top three winners, along with the runners-up, are posted on DEQ's YouTube page:

www.YouTube.com/user/UtahDEQ



Public Outreach to Combat Summertime Ozone

DEQ mounted a public education campaign this summer to educate the public on the causes and effects of ozone, how to reduce emissions, and protect personal health. The collaborative effort brought together television meteorologists, the Department of Health, and organizers of a statewide air quality challenge to get the word out to the public about ozone pollution.

Summer Ozone

Ozone forms when nitrogen oxides (NO_x) and volatile organic compounds (VOCs) react in the presence of sunlight. Ozone levels begin to rise in the valleys as the weather turns hot and the air gets stagnant.

Ozone affects the lungs and respiratory system and can trigger a variety of health problems, including chest pain, coughing, throat irritation, and congestion. People with lung disease, children, older adults, and people who are active outdoors may be particularly sensitive to ozone.

Outreach Strategy

Reducing the emissions that create ozone is the best way to decrease ground level ozone levels during the summer months. Increasing public awareness of the air quality issues surrounding ozone was critical to tackling high summertime ozone concentrations. The Communications Office developed a three-pronged approach to disseminate information, engage the public, and encourage collaboration among State and local groups working to improve Utah's air quality.

Inform

Most residents recognize that poor air quality is a seasonal problem in Utah, but are often uninformed about:

- sources of summertime air pollution;
- individual behavior changes that improve air quality; and,
- health impacts of unhealthy pollution levels.

Sharing this information with the general public during high summertime ozone levels was an essential component of the public awareness campaign.

The Division of Air Quality (DAQ) teamed up with reporters and meteorologists to provide viewers and readers with information on air quality and health information on ozone. DAQ's Web based tools, including real-time monitoring of ozone levels, forecast data to track ozone levels, and trend charts over a five day period, made it easy for people to check ozone levels throughout the day. DEQ used social media to provide up-to-the-minute information on ozone, including ozone alerts and tips on how to reduce emissions, exercise safely, and minimize exposure to unhealthy pollution levels.

Participate

DEQ asked the public to take action improving air quality during the summer ozone season. Because individual choices and actions can contribute to the rise in ozone levels, public involvement is critical to reducing the emissions that lead to ozone.

Collaborate

DEQ worked with State and local governments, business groups, and a wide variety of interested stakeholders to disseminate information and encourage public participation. DEQ worked closely with the Utah Department of Health and local health departments to create a series of health "Tweertorials" for use during ozone

season to educate residents on the ways they can protect their health on high ozone days.

DEQ was active in the Clear the Air Challenge, a month long competition during July that gave residents the opportunity to reduce vehicle emissions by choosing alternatives to driving alone using TravelWise strategies. The 2013 challenge surpassed the previous year's goals, reducing 23,653 pounds of emissions while saving nearly 2 million vehicle miles traveled. Almost 7,300 people participated, along with dozens of companies.

Next Steps

The Communications Office built on this summer outreach for its winter PM_{2.5} pollution public awareness campaign. DAQ plans to expand its communications efforts during air pollution episodes to meet the growing public demand for accurate, up-to-the-minute air quality information.



DEQ provides important technical and funding assistance to the public, businesses, and government entities.

Assistance

The Department of Environmental Quality provides important technical and funding assistance to the public, businesses, and government entities.

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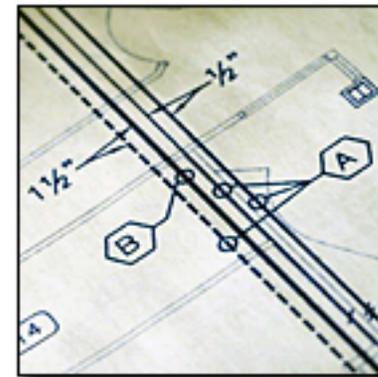
Online Tool Helps Businesses Find the Right Permit

In October 2013, DEQ launched the Permit Wizard, a new online tool to help companies and individuals determine which permits, registrations, and authorizations they need for a specific project.

A DEQ leadership team spent two years designing and developing the Permit Wizard. The Wizard includes all the permits, licenses, registrations, and certifications issued and administered by DEQ. Step-by-step instructions guide users through DEQ's permitting and licensing programs, directing them to the appropriate documents through a series of "yes" or "no" questions. Because projects often require permits from several divisions at DEQ, this process helps users determine which permits or licenses they will need for their particular project. Each section of the Wizard includes a brief explanation of division programs, descriptions, and links to permitting requirements and guidance documents, and DEQ staff contact information for questions.

DEQ also offers a pre-design program, which connects businesses with permitting staff. During pre-design meetings, Division representatives discuss the permitting process and identify the permits needed for the project. These representatives serve as program contacts for the company during the permitting process.

Interest in the Permit Wizard generated over 950 hits within its first two months. DEQ hopes to expand the Permit Wizard in the future to allow users to collect required forms in a single location to download or print.



Courtesy Inspections Find Equipment Leaks

DEQ hopes courtesy inspections using an infrared camera will help reduce equipment leaks at oil and gas operations in the Uinta Basin. These invisible leaks can emit volatile organic compounds (VOCs) that contribute to winter ozone in the Basin. This state-of-the-art infrared technology can find leaks that would otherwise escape detection. Fewer leaks means better air for Basin residents.

DEQ's Business Assistance Program offers courtesy leak detection audits to oil and gas companies as part of their outreach activities to the oil and gas industry. DEQ purchased an infrared camera (IR) to help the oil and gas industry detect emissions from leaking equipment. Using an IR camera to detect gas leaks, followed by leak repairs, could prove to be an important emission reduction strategy in the Basin. Reducing emissions from oil and gas operations would help reduce ozone, which forms when nitrogen oxides (NOx) react in sunlight with VOCs.

IR cameras are a proven technology applied in other states, using thermal imaging that "sees" and measures heat energy and can pinpoint leaks in tanks, pipelines, and oil

and gas facilities. IR cameras can scan a wide area from a safe distance, reducing the risk to workers who would otherwise have to enter potentially hazardous areas to check for leaks. Gas leaks show up as white or black clouds, depending on the camera setting. IR cameras visualize gas leaks in real time and can record the images to video.

A handful of companies in the Uinta Basin already rely on the IR cameras to reduce emissions, capture valuable product that would be lost through leaks, and keep their employees safe. Given the safety, regulatory, and financial incentives for reducing methane and other VOC emissions, monitoring for leaks is a good business practice. Fewer leaks ensures better air quality, better financial return on oil and gas operations, and better compliance with strict federal standards for VOC emissions.

DEQ's courtesy program demonstrates the effectiveness of this infrared technology, showing companies the benefits of IR cameras, both to their bottom line and to air quality in the Basin.



Nonpoint Source Program Reduces Nutrient Pollution

The Division of Water Quality (DWQ) provides State and federal funding to reduce nonpoint source (NPS) pollution in priority watersheds throughout the state. In Fiscal Year 2013, the program provided almost \$900,000 to projects to decrease nonpoint source pollution.

NPS Program and Section 319 Funding

Utah's Nonpoint Source (NPS) Program works to improve the water quality of impaired water bodies through a voluntary, incentive-based approach. DWQ provides financial assistance to cooperators to offset the cost of implementing water quality improvement projects. These projects use a variety of Best Management Practices

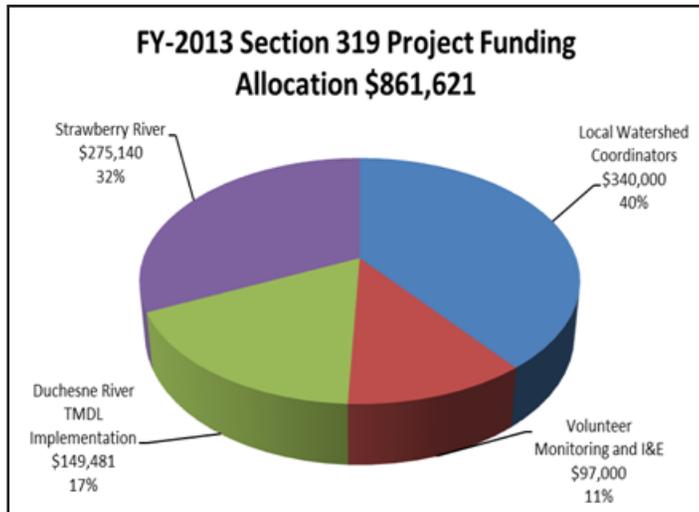
(BMP) and follow the watershed based planning strategy contained within the Statewide NPS Management Plan.

In 2013, DWQ revised the Statewide Nonpoint Source Management Plan. The previous plan from 2001 was badly outdated. The Environmental Protection Agency (EPA) approved the new plan in the fall of 2013.

The new management plan targets NPS funding in specific areas with existing watershed plans. These watershed plans identify the likely sources of pollutants and BMPs that could be used to reduce that pollution. The Statewide Plan contains objectives and milestones that will be evaluated annually to determine program effectiveness.

The EPA awards Section 319 funding each year to Utah through a grant in accordance with Section 319 of the Clean Water Act. Section 319 funding requires every project to adhere to a 60/40 cost share rate. This means that 60 percent of the total project cost can be paid using Section 319 funding, and the remaining 40 percent must be paid by other non-federal funds or as in-kind match. Section 319(h) funds' recipients can include non-federal government entities, watershed groups, and individual cooperators.

The Utah NPS program received \$1,364,000 in federal Section 319(h) funds in FY 2013. Of these funds, \$502,379 was used for program-related staffing and support, while



Watershed	Number of Projects Completed	319 Funding	Funding from Other Agencies	Estimated Total P Load Reductions (lbs/year)	Estimated Sediment Load Reductions (tons/year)
Middle Sevier	0	\$0	\$0	0.0	0.0
Jordan River	0	\$0	\$0	0.0	0.0
Weber River	5	\$15,810	\$9,480	73.6	87.2
Bear River	2	\$38,808	\$0	35.0	41.0
San Pitch	4	\$90,260	\$89,109	189.2	166.0
Upper Sevier	1	\$0	\$75,000	55.0	110.0
Uintah Basin	1	\$76,762	\$83,755	5.1	N/A
Total	13	\$221,640	\$257,344	357.9	404.2

the remaining \$861,621 funded project grants. This was a 5 percent funding cut overall from the year before. However, the Division adjusted its budget to make an additional \$30,821 available for project implementation even with budget cuts.

In FY 2013, Nonpoint Source Program funds went to the Volunteer Monitoring Program, local watershed coordinators, Best Management Practice (BMP) implementation, and watershed group support.

Projects Funded with State NPS Funds in FY 2013

Watershed	Project Sponsor	Project Description	Amount Awarded
Bear River	Private	AFO Project	\$30,000
GSL	Environ International	Cyano Bacteria and Mercury	\$43,004
Colorado	USGS	Newcastle Thermocline Study	\$43,425
Colorado	Helper City	Price River Feasibility Study	\$35,000
Lower Bear River	UDEQ	Lower Bear River TMDL	\$25,000
GSL	USU	Mapping of Wetland Vegetation	\$40,531
San Pitch	Private	Stream Restoration	\$37,640
San Pitch	Frandsen MacArther Ditch Co.	Irrigation System	\$75,000
South East Colorado	UDEQ	Moab Area Watershed Partnership Coordinator	\$38,500
Statewide	USU	Groundwater Outreach	\$30,000
Statewide	USU	Septic I&E Outreach	\$48,041
Statewide	UDEQ	Watershed Coordinators	\$30,000
Statewide	UWCC	UWCC	\$10,000
Statewide	USU	AFO Outreach	\$25,162
Statewide	UDEQ	Mercury Take Back Program	\$6,000
Uinta Basin	USU	Pariette Draw Study	\$59,806
Uinta Basin	USGS	Pariette Draw Study	\$27,010
Upper Sevier	UACD	Stream Bank Stabilization	\$50,000
Jordan—Utah Lake	UACD	Watershed Restoration—Wallsburg	\$138,760
Weber Basin	UDEQ	Targeted Basin—East Canyon Implementation	\$114,621
Weber Basin	UDEQ	Targeted Basin—Upper Weber Implementation	\$37,500
Weber Basin	UDEQ	Silver Creek Nutrients TMDL Study	\$30,000
		Reserve for on-site systems	\$25,000
Total			\$1,000,000

Voluntary Cleanup Program

The Voluntary Cleanup Program (VCP), under the direction of the Division of Environmental Response and Remediation (DERR), provides a mechanism for property owners and prospective purchasers of property to clean up contaminated sites, including brownfields.

A property owner or prospective purchaser who suspects contamination can request a pre-application meeting with DERR to discuss options for addressing the contamination. If DEQ determines the property is eligible for the program, the site must be characterized to evaluate the nature and extent of the contamination. Risk-based approaches link cleanup levels to the intended land use, with engineering and institutional controls also being part of a cleanup strategy that will protect human health and the environment. In addition to addressing environmental concerns at these sites, voluntary cleanups promote the redevelopment and reuse of previously contaminated, but not “clean,” properties.

DERR issues a Certificate of Completion (COC) for the successful cleanup of a VCP site. The COC provides a limited release of liability under State statute. The COC is transferable to subsequent property owners and protects future lenders who make a loan secured by property covered by the COC.

Public participation is an important component of the Voluntary Cleanup Program. Property owners must notify adjacent landowners and place a notice in the local newspaper announcing the start of the 30-day comment period on the proposed Remedial Action Plan. DEQ may also request further public outreach activities based on the project need and level of community interest.

As of December 2013, DERR had issued 41 Certificates of Completion under the VCP, with approximately 967 acres returned to beneficial uses.



Using an infrared camera to detect volatile organic compounds at an oil and gas site.

BizHelp Compiles Guide for Oil & Gas Industry

The recent growth in oil and gas operations in Utah has intensified interest in the ways energy producers can reduce their environmental impacts. BizHelp, DEQ's business assistance program, has assembled a Top Ten Best Management Practices for the Oil and Gas Industry that offers a wide assortment of cost effective practices that oil and gas producers can use to protect air and water quality during operations and reduce the use and production of hazardous wastes.

While regulations can address many of the environmental consequences of oil and gas production, voluntary measures to prevent pollution during drilling and production, processing, storage, transmission, and distribution can complement regulations and result in more environmentally responsible development and compliance. Many oil and gas companies find that using BMPs helps them comply with environmental regulations, cuts air emissions, reduces water use, controls erosion, reduces the amount of hazardous waste generated, and often saves companies money over the long term.

The product of exhaustive research by BizHelp staff, DEQ BMP recommendations benefit oil and gas operators looking to improve their operations, meet regulatory requirements, protect the environment, and enhance their bottom line.

Utah Clean Diesel Program

The Utah Clean Diesel Program (UCDP), a clean air initiative that began in 2008, has helped 62 small businesses, 31 school districts, and two government entities purchase cleaner and more fuel efficient equipment for their operations. The program has provided over \$6.7 million in State and federal grants, made possible through the successful collaboration with State and federal agencies, county and municipal governments, community and non-profit organizations, and industry groups.

Clean Diesel, Cleaner Air

Diesel engines are a major source of pollution. They emit particulate matter (PM), nitrogen oxides (NOx), volatile organic compounds (VOCs), and hazardous air pollutants (HAPs). These pollutants contribute to poor air quality in Utah and can cause serious health problems, especially for children, the elderly, and the chronically ill.

The Utah Division of Air Quality established the Utah Clean Diesel Program to reduce diesel emissions. Retrofit and replacement strategies include:

- **Auxiliary Power Units**
Provides an alternative to idling to heat and cool sleeper cabs.

- **Compressed Natural Gas Vehicles**
Burn cleaner than diesel fuel vehicles
- **Diesel Oxidation Catalysts**
Break down pollutants using a catalytic reaction
- **Diesel Particulate Filters**
Remove diesel particulate matter from the exhaust pipe of a diesel engine.

Program Accomplishments

2014

The UCPD received \$500,000 to assist six small businesses in retrofitting long-haul trucks with diesel particulate filters (DPF) and auxiliary power units (APU), as well as replacing non-road and on-highway equipment with cleaner units.

2013

Twenty State-operated snowplows servicing Salt Lake and Utah counties received retrofits for diesel oxidation catalysts (DOC). The UCDP also provided assistance to C.R. England Global Transport to replace a 2002 short-haul, diesel truck with a 2014 compressed natural gas (CNG) short-haul truck.



Division of Drinking Water

DDW regulates Utah's 1,019 public drinking water systems. Programs and metrics for 2013 include:

- **Source Protection Program**
187 Source Protection Plans Reviewed
- **Review of Engineering Designs of Drinking Water Facilities Prior to Construction**
1,020 Plans
- **Implementing Water Quality and Monitoring Requirements**
111,381 Analyses
- **Training & Certifying System Operators**
2, 216 Certified Operators
- **Financial Assistance**
18 Projects
\$21,852,600 in Construction Funding
- **Cross Connection Program**
827 Backflow Technicians
- **Inspections of Water Utilities**
340 Inspections
- **Enforcement Actions When Necessary**
19 Enforcement Actions

Assistance Programs Ensure Safe Drinking Water

Allocating financial assistance for drinking water systems is a critical component of the Drinking Water Board's responsibilities and vital to ensuring the safety and reliability of drinking water, particularly in smaller communities. The Division of Drinking Water (DDW) and the Drinking Water Board work closely together to ensure this money is allocated equitably for eligible projects that improve the water systems of recipients. DDW staff provides engineering review and financial viability evaluations to the DWB for proposed projects. The DWB, in turn, uses this technical information to make a determination and authorize loan terms and loan amounts.

The 1996 amendments to the Safe Drinking Water Act (SDWA) provide federal financial assistance for drinking water systems to construct needed facilities through a federally funded program known as the State Revolving Fund. This federal funding supplements a long-standing, State-funded program that also provides for infrastructure construction. This funding is essential to protect and enhance the state's drinking water systems, particularly for the small communities in Utah that typically have no other option.

DDW engineers review applications for financial assistance, prepare project evaluation and feasibility information packets, present applications to the Drinking Water Board, review project engineering plans and specifications, work with applicants to collect and submit the required loan closing documentation, perform construction inspections, review loan recipient's reimbursement requests, and review operating permit requests when construction is complete.

Application & Funding Processes

As directed by the Drinking Water Board, DDW staff use a priority system to rank applicants. Factors used in this ranking system include:

- evidence of waterborne illnesses;
- inadequate water source capacity;
- inadequate water treatment systems or facilities;
- failing storage systems; and,
- deteriorating water distribution systems.

DDW staff also looks at the overall cost of the project and the individual customer's ability to repay the loan. Project readiness is also factored into the ranking.

Based on information provided by DDW staff, the Drinking Water Board can offer disadvantaged communities better financial terms, including a combination of loans and grants and/or lower interest rates to ensure that the project is affordable for the water system's residents. Rules contained in the Utah Code describe the ways the Drinking Water Board and DDW staff work together to allocate funding for disadvantaged communities and assign loans, grants, terms, ranking etc. under State and federal SRF programs.

Once a project sponsor submits an application for funding, Division staff prepare an engineering review, a financial viability evaluation, and a capacity development analysis, which is an evaluation of the business viability of the water system. This analysis by DDW is summarized in a report sent to Drinking Water Board members prior to a board

meeting. Before the report goes out to the full board, DDW works with the Board's Financial Assistance Committee to ensure that the prepared material is complete and meets the needs of Board members.

At Board meetings, DDW staff provide a brief overview of the project and present a recommendation. If water system representatives are present, they are invited to address the Board. Following these presentations, Board members ask DDW staff and water system representatives questions to assure that they understand the project and the community's needs before taking a vote on the financial assistance requested. Frequently, the members of the Board will discuss the terms of the financial assistance amongst themselves before voting.

This cooperative working relationship between the Division of Drinking Water and the Drinking Water Board ensures that project applicants receive a full and fair hearing and thorough consideration of their requests. This strategy helps guarantee that water systems in the state have access to the construction assistance they need to bring clean drinking water to Utah residents.

Success Story

Bushnell Army Hospital Cleanup

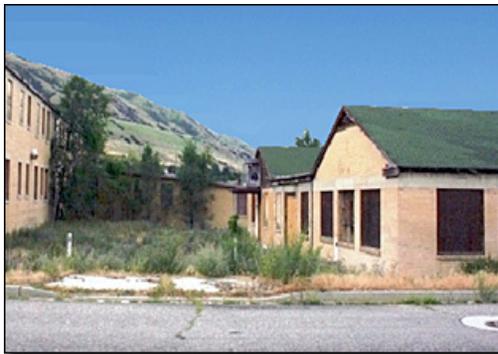
In December 2010, Utah State University (USU) purchased the former Bushnell Hospital and Intermountain Complex in Brigham City to establish a new regional campus at the site.

The property was a former Army hospital that later became a school for Native American children. The property was vacant and the various buildings on the site had stood abandoned since the closure of the school in 1984. Criminal activity on the property over the years added to the perception of blight and deterred development of the site.

The Environmental Protection Agency (EPA) investigated the site under its Superfund Program to assess possible soil and groundwater contamination. Based on this evaluation, the EPA did not place the site on its National Priorities List. However, USU's "all appropriate inquiry (AAI)," a

process used to evaluate the likelihood of contaminants on a site, found asbestos containing material (ACM) in several historical buildings.

To address the ACM, USU worked with DERR and applied for an EPA Brownfields Cleanup grant in 2011. EPA awarded USU a cleanup grant and the university targeted seven buildings for asbestos removal. USU worked with DERR and the Division of Air Quality (DAQ) to develop a strategy for remediating the site. The University completed ACM abatement and building demolition in accordance with DAQ rules. EPA considered the cleanup complete under the grant in April 2013. The property is currently ready for redevelopment as a new regional campus.



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