

## Success Stories – Siting Renewable Energy on Contaminated Land



### New Rifle Uranium Mill Tailings Radiation Control Act (UMTRCA) Title I Site, Colorado *Solar to Power the Rifle Regional Wastewater Reclamation Facility at Former Uranium Processing Site*

*EPA is encouraging the development of renewable energy by identifying current and former contaminated lands and mining sites that present opportunities for renewable energy development. This site demonstrates the benefits of siting renewable energy on contaminated lands.*

#### Site Description

The New Rifle Uranium Mill Tailings Radiation Control Act (UMTRCA) Title I site is located approximately two miles southwest of the City of Rifle, Colorado. The Colorado River defines its southern boundary. The site is the chosen location of Rifle's proposed Energy Innovation Center—an innovative industrial cluster that will promote bio-based industry development and pioneering energy technologies and provide quality, reliable, and clean power sources to the community and local industry. The first installation of clean energy technology on this site is a 12-acre, 1.7 megawatt (MW) solar zero emission solar energy system to power Rifle's new \$23.2 million Regional Wastewater Reclamation Facility, which is also located on the site.

#### Property History

The New Rifle mill, owned and operated by Union Carbide Corporation (UCC), produced uranium and vanadium concentrates, processed tailings and uranium ore, and refined upgrade products from 1958 to 1970. Uranium produced during this time was sold to the Atomic Energy Commission (AEC), while all of the mill's vanadium production was delivered to the commercial market. During the period, the mill averaged 400 tons of ore per day (TPD) throughput and treated a total of 1.8 million tons of ore. At the termination of UCC's last AEC-procurement contract (December 1970), there were about 2.5 million tons of radioactive tailings impounded at the New Rifle Mill site. The mill continued to produce uranium during 1971 and 1972 for the commercial market, and part of the mill was used to produce vanadium concentrate from 1973 to 1984.

From years of these milling operations, the site became contaminated with radioactive tailings, and the groundwater with arsenic, molybdenum, nitrate, selenium, uranium, and vanadium. In 1978, Congress passed the Uranium Mill Tailings Radiation Control Act (UMTRCA) that required the cleanup of 24 inactive uranium ore processing sites, including the New Rifle site by the U.S. Department of Energy (DOE). The site under UMTRCA was purchased for cleanup by the State, while DOE performed the cleanup of surface and groundwater contamination at the site. Encapsulation of radioactive materials in U.S. Nuclear Regulatory Commission-approved disposal cells began in spring 1992 and was completed in October 1996. The site's groundwater contamination is being treated by natural flushing in conjunction with institutional controls and monitoring. The State of Colorado transferred ownership of the site to the City of Rifle, Colorado in 2004.



#### QUICK FACTS:

<b>Location:</b>	EPA Region 8, Garfield County, CO
<b>Property Size:</b>	130 Acres
<b>Site Ownership:</b>	City of Rifle, CO
<b>Former Use:</b>	Uranium and vanadium processing site
<b>Contaminants:</b>	Arsenic, molybdenum, nitrate, selenium, uranium, and vanadium
<b>Project Type:</b>	DOE Uranium Mine Tailings Remediation Act (UMTRA)
<b>Type of RE:</b>	Solar PV
<b>Key Partners:</b>	U.S. Department of Energy Office of Legacy Management, State of Colorado Department of Public Health and Environment, Garfield County, CO, SunEdison
<b>Current Status:</b>	Under construction, 2009 completion (1.7 MW Solar PV system)

#### PROJECT HIGHLIGHTS:

- 12-acre, combined 2.3 MW solar PV systems power drinking water and wastewater treatment facilities, reducing greenhouse gas emissions by 76,000 tons each year.
- Project financed, installed and maintained by electric utility SunEdison in a power purchase agreement with the City of Rifle allowing the city will to purchase electricity from the utility at a reduced rate for 20 years.
- Rifle's taxpayers saved approximately \$2 million by siting the project on contaminated land already owned by the city.
- Energy Innovation Center adjacent to the site will help create green jobs for local residents, foster entrepreneurial opportunity, and guide land use decisions in the area to be sustainable, innovative, and technology-driven.



## Renewable Energy Development

The City of Rifle began construction of its new wastewater reclamation facility on the UMTRCA Title I site in December 2008. SunEdison, LLC (the largest solar energy provider in North America) began installation of a 1.72 MW Direct Current (DC) solar photovoltaic (PV) system on 12 acres of the site in December 2008. The system will provide 60 percent of the daytime power needed to operate Rifle's wastewater reclamation facility. On a nearby site, SunEdison installed a 0.60 MW DC PV solar system that provides 100 percent of the power needed to pump drinking water for local residents from the Colorado River. During

their first complete year of operation, these two systems will produce more than 4 million kilowatt hours (kWh) of clean solar energy, and more than 75 million kWh over 20 years—enough energy to power 7,039 homes for a year. Over the first 20 years of generation, the two zero-emission systems will replace the more than 76 thousand tons of carbon dioxide that would have been emitted by electricity production from fossil fuels. In addition to solar energy, a geothermal system will heat and cool the wastewater facility's administration building, and premium efficiency motors will power the facility's pumping system.

Solar energy produced at the plant will contribute to Colorado's renewable portfolio standard (RPS) mandate, which requires large utilities to generation 20 percent of the electricity they sell from renewable sources by 2020. Of this amount, four percent must be specifically from solar energy. SunEdison contributes to its RPS obligation through solar renewable energy certificates (RECs) from power generated at the site. In return, SunEdison will sell power from the grid to the City of Rifle at a reduced rate under a 20-year power purchase agreement.

In addition to the PV solar project, and at the core of Rifle's Energy Innovation Center is the development of an bio-based industry cluster—a collection of individual pads for private, bio-based companies that can utilize renewable bio-based materials such as carbohydrates to produce products and energy, helping to make Rifle a center for energy and bio-processing and production. These pads will all be connected as part of a large power grid, and will be able to either utilize or supply electricity, steam heat, cooled water, or natural gas to other users on the site or onto the external power grid. The Rifle Energy Innovation Center also will include a bio-based research and visitor center, an energy feedstock storage area, and gathering space for renewable energy expositions and conferences.



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To learn more about siting renewable energy on contaminated land, visit: [www.epa.gov/renewableenergyland](http://www.epa.gov/renewableenergyland)