

The Subheadings for all the Natural Resources of Southeast Utah

An Introduction	Air Quality	Archeology
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Events	Floods	Food
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Housing	Invasives	Maps
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Wildlife Conservation		

An Introduction

Photo: A Colorado River meander near Shafer Canyon

YES! Canyonlands Watershed Council is a charitable organization.

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Or, you can donate via Venmo [HERE](#)



UTAH DIVISION OF WATER RIGHTS

- [All Public Notices by Utah Division of Water Rights](#)
- [Water Right Diversion / Depletion Priorities \(archived\)](#)
- [Home page](#)
- [Water rights information and queries](#)
- [Minutes, Information, and Presentations from Public Meetings and Trainings](#)
- [Protest Application Form](#)
- [Search locations with Google Earth](#)
- [Well log search engine](#)
- [Water Rights Area Map with Policy by Area](#)
- [Utah Code 73-3-8: Water and Irrigation](#)
- [Studies by Utah Division of Water Rights](#)
- [Water Right Violations](#)

COLORADO STATE

Decision Support System

- [Home Page](#) (includes water rights)

MOAB ALMOST DAILY REPORT (MADAR) The MADAR web site aims to assemble a large amount of information relevant to Moab, Grand County and SE Utah.

- [Home Page](#)

GRAND COUNTY

- [Grand County Parcel Map](#)

PUBLIC NOTICES

- [Utah Legal Notices](#)
- [Utah's Public Notice Website](#)
- [Public Lands Coordination Office](#)
- [Utahns for Ethical Government](#)

NOTICE OF PUBLIC MEETINGS

- [Times - Independent](#)
- [State of Utah](#)
- [City of Moab](#)
- [Grand County](#)

GRAMAS (Utah's freedom of information legislation)

- [The legislation](#)
- [Division of Air Quality](#)

BUREAU OF LAND MANAGEMENT (BLM)

- [Utah State Bullentin Board](#)
- [Newsroom](#)
- [Moab BLM: General Announcements](#)
- [Monticello BLM: General Announcements](#)

COMMUNITY IMPACT BOARD

- [Agendas, Minutes & Audio](#)

MINING CLAIMS

- [Claim Ownership](#)

UTAH DIVISION OF ENVIRONMENTAL QUALITY

- [Interactive project map](#)

UTAH DIVISION OF AIR QUALITY

- [Document archive](#)
- [Listing of Notices of Intent](#)

UTAH DIVISION OF OIL, GAS AND MINING (UDOGM)

- [UDOGM Board Meetings](#)
- [UDOGM Board Notes and Dockets](#)
- [UDOGM permit files \(complete\)](#)
- **(Username and Password: ogmquest)**
- [Oil production in Utah by County](#)
- [Gas Production by County](#)
- [Use Google Earth to locate oil and gas wells and documentation](#)

UTAH DIVISION OF WATER QUALITY

- [Public Notices](#)
- [Public Participation Page](#)
- [ftp site](#)

UTAH STATE LEGISLATURE

- [Auditor General](#)
-

Air Quality

PRESENTATIONS

- January 2026 - [Preliminary Study: Moab versus Grand Junction Air Quality Comparison and Analysis](#). Agee.

NEWS

- [January, 2015 - Data Shows Moab Air Quality Usually Meets Federal Limits](#). Times Independent.
- [January, 2015 - State Presents Ozone Findings to City Council](#). Moab Sun News.

DOWNLOAD AIR MONITORING APPS

- [UtahAir for iPhones](#)
- [Utah Air for Androids](#)

UTAH DIVISION OF AIR QUALITY (DAQ)

- [DAQ Home Page](#)
- [Website - Public Comment: Rule and Plan Changes](#)
- [Website - Uintah Basin Studies](#)
- [Website - Real time air quality data](#). DAQ.

Environmental Protection Administration

- [Website - Air quality in our national parks](#)
- [Website - USA air quality interactive map](#)
- [Website - air data](#)
- [Website - Ambient Monitoring Technology Information Center](#)
- [Website - Regulations and guidance](#)

US GEOLOGICAL SURVEY

- [Website - Dust detection in the southwest USA](#)

NOAA

- [Website - Real time atmospheric CO2 data at Hawaii](#)

DESERT RESEARCH INSTITUTE

- Radiation Monitoring: [Community Environment Monitoring Program](#)

OTHER DATA PORTALS

- [Website - Community, Collaborative Rain, Hail & Snow Network](#) (CoCoRahs)

NGOs

- [Utah Physicians for a Healthy Environment](#)
- [Green Action for Health and Environmental Justice](#)

DOCUMENTS

- [2015 - Moab Air Quality Data](#). DAQ.
- [2014 - Air Quality Monitoring Plan](#). DAQ.
- [2013 - Methane Emissions from Airborne Measurements Over a Western United States Natural Gas Field](#). Karion et al.
- [2012 - Uintah Basin Winter Ozone & Air Quality Study](#). USU.
- [2009 - Air Quality Report: Norther Colorado Plateau](#). NPS.
- 1991 - [Governor Bangerter's Air Quality Plan](#). (Complete record. Large File. Searchable content.)

REAL-TIME DATA

- [Click here](#) to see monitoring data for national parks.
- [Click here](#) to see monitoring data at Canyonlands National Park
- [Click here](#) to see monitoring data in the Uinta Basin
- [Click here](#) for a tool that shows wind direction

RULEMAKING

- [2014 - Petition from Wild Earth Guardians to EPA](#)

NEWS

- [Dead Babies Near Oil Drilling Sites Raise Questions For Research](#). Denver Post.
 - [Utah air plan soft on industry, says EPA](#). Salt Lake Tribune.
 - [Judge rejects lawsuit over Utah's belated air-quality plan](#). Salt Lake Tribune.
 - [Methane hot spot \(4 Corners\) bigger than expected](#). NASA.
 - [How Clean is our air?](#) Moab Sun News.
 - [Ozone to be tracked](#). Moab Sun News.
 - [DAQ to monitor ozone levels in Moab](#). Times-Independent.
-

Archeology



Hovenweep National Monument

POLICY

- [National NAGPRA](#)

UTAH

- [BLM Utah Archeology](#)
- [Utah Statewide Archeology Society](#)

GRAND COUNTY

- [1980 - Cultural Resource Summary East Central Utah Moab District](#). Pierson.

UINTAH BASIN

- [2002- Perspectives Revisited: Overview of Cultural Resources Uinta Basin & Tavaputs Plateau](#). Spangler.
- [2007 - An Intuitive Survey & Site Condition Assessment in Desolation Canyon](#). Spangler.

NUMIC CULTURE

- [Numic Culture Chronology](#)
- [Uintah Ouray Ute Lands](#). 1979. O'Neil.
- [Ute Nation Chronology](#).

- [1979 - History of Uintah Ouray Ute Lands](#). O'Neil.

DOLORES RIVER

- [Dolores River Project](#)

BOOK CLIFFS

- [1955 - A Reappraisal of the Fremont Culture \(Book Cliffs\)](#). (Photos) Wormington.
-

Bureau of Land Management (BLM)



Fisher Towers in Professor Valley

BUREAU OF LAND MANAGEMENT

In 1946 the federal agencies known as General Land Office and Grazing Service were merged and renamed as the Bureau of Land Management (BLM). In 1975 Congress passed the Federal Land Policy and Management Act (FLPMA), which declared that federal lands managed by the BLM would remain under public ownership and under a multiple-use agenda, which includes opportunities for wilderness protection.

[History of the Bureau of Land Management \(BLM\)](#)

The BLM manages 22.9 million acres in Utah (42%) with 3.6 million acres in Grand and San Juan Counties.

The BLM also manages several National Monuments in the Colorado Plateau such as [Grand Staircase/Escalante](#) and [Canyons of the Ancients](#).

BLM BULLETIN BOARDS FOR PROJECTS UNDER ENVIRONMENTAL COMPLIANCE LAWS

- [BLM's NEPA Handbook](#) (how to write comments)
- [Utah BLM Environmental Notification Bulletin Board](#)
- [Moab BLM: General Announcements](#)
- [Monticello BLM: General Announcements](#)

OIL AND GAS LEASING

FEBRUARY 2013 OIL AND GAS LEASE

[Click here](#) for information; and also [here](#).

FEBRUARY 2012 OIL & GAS LEASE

Grand and San Juan Counties

- [Utah BLM 77 Lease Parcel Report](#)
- [Preliminary Oil & Gas Sale List](#)
- [Oil & Gas Leasing Reform Implementation Reform](#)
- [Prelim Map Feb 2012](#)
- [Utah Lease Notices](#)
- [Utah Stipulations](#)

HOME PAGES

- [Moab BLM Office](#)
- [Monticello BLM Office](#)
- [Price BLM Office](#)
- [Utah State Office](#)
- [Vernal BLM Office](#)

RESOURCE MANAGEMENT PLANS (RMP)

- [Moab Field Office](#)
- [Monticello Field Office](#)
- [Price Field Office](#)
- [Vernal Field Office](#)

RMP Archive

- [2008 Moab FEIS RMP](#)
- [2008 Moab Final Plan](#)
- [2008 Moab RMP Appendices](#)
- [2008 FEIS Monticello RMP](#)
- [2008 Monticello Final Plan](#)
- [2008 Monticello RMP Appendices](#)
- [1991 Monticello RMP](#)
- [Moab Biological Opinion](#)
- [Monticello Biological Opinion](#)
- [2008 Vernal Final Plan](#)
- [Vernal Biological Opinion](#)

- [Vernal Appendices](#)
- [Vernal Maps](#)

1992 BOOK CLIFFS HIGHWAY DRAFT EIS

- [Preliminary Draft EIS For Highway from Ouray to Cisco.](#)
- [Draft EIS Highway from Ouray to Interstate 70.](#)
- [EA for Proposed Ouray to Cisco Highway Survey.](#)
- [EA for Proposed Ouray To Cisco Highway.](#)
- [Bookcliffs Highway Correspondence.](#)
- [2015 - Bookcliffs Transportation Corridor Study.](#) Grand County.

COLORADO RIVER RECREATION

- [Colorado River Business Plan](#)
- [Utah BLM Special Recreation Permit Process Handbook](#)

LA SAL COMPLEX EA

- 2010 (December) - [La Sal Complex Plan Environmental Assessment by Bureau of Land Management](#)
- [Click here](#) to visit dedicated BLM website
- [Click here](#) to download the complete EA

LAND EXCHANGES

- [2013 - Utah Recreational Land Exchange](#)

OIL & GAS

[2010 - Gasco EIS Volumes 1 & 2.](#) Vernal BLM.

Please [write](#) or [call us](#) at FarCountry to report a problem or add resource documents.

OLD SPANISH NATIONAL HISTORIC TRAIL

- [NPS website](#)
- [BLM website](#)
- [Old Spanish Trail Association](#)
- [Old Spanish Trail EIS Combined](#)

- [Old Spanish Trail Maps Combined](#)
- [Old Spanish Trail Historic Timeline](#)

MAPS

- [Existing and proposed oil and gas parcels](#)
- [BLM and SITLA oil and gas leases](#)

MILL CREEK PARTNERSHIP

- [Mill Creek Partnership website](#)

SOCIOECONOMIC REPORTS

- [2012 Grand County Workshop](#)

BLM WILDERNESS

[1990 - Utah Stewide Wilderness Final EIS](#). BLM.

[1999 - Maps of Utah BLM Wilderness Inventory \(cache\)](#). GPO.

WATERSHEDS

[Mill Creek Partnership documents](#)

Castle Valley



Winter in Castle Valley

Castle Valley is a community of Grand County north of Moab and accessed by "The River Road" or Hwy 128. The valley is about 8 miles long and 3 miles wide (15,360 acres) and drops from nearly 6,000 feet to about 4,200 in elevation. At the upper valley is the community of Castleton.

Up until the 1920's, the focus of the Castle Valley farming community was towards Castleton, then a small mining and shepherding boomtown, and the post office/general store in Richardson, an outpost in Professor Valley. With the decline of Castleton and the disappearance of Richardson, Castle Valley's isolation led to the selling and consolidating of land into large ranching parcels. The "old ranch house" near the large cottonwood tree was the homestead of what eventually became the McCormick Ranch.

The Carlsberg Development Corporation bought the McCormick ranch and got approval for the plat of Castle Valley River Ranchos in 1973. The sale of lots began in 1974.

In the early years, as an unincorporated community in Grand County, the Castle Valley River Ranchos Property Owners Association was critical to governance. In 1985, the Town of Castle Valley was officially incorporated.

WEB PAGES

- [Town of Castle Valley](#)
- [General Plan](#)

GROUNDWATER

See also Groundwater section [here](#)

- [Castle Valley Groundwater Modeling Draft](#). Downs.
- [Castle Valley Groundwater Modeling Final](#). Downs.
- 1996 - [Recharge area and water quality of the valley-fill aquifer Castle Valley, Grand County](#). UGS.

- [2004 - Ground-water quality classification and recommended septic tank soil-absorption-system density maps, Castle Valley, Grand County, Utah.](#) Lowe, USG. (Plates)
- [2016 - Hydrologic Assessment of Surface and Water Resources in Castle Valley, UT; Analysis and Water Budget;Final Report Phase 1](#)
- [2025 - Hydrogeologic Study of Castle Valley, Grand County Utah.](#) UGS, Brinkman.

FLOODS

- [2009 - Flood Insurance Study Grand County.](#) FEMA.
-

Climate



Dark Canyon waterfall and redbud tree

VISIONARY STRATEGIES

Ten Strategies for Climate Resilience on the Colorado River Basin

- [Homepage](#)
- [Press Release, Program Snapshot & Program Summary](#)
- [Full Report](#)
- [Appendix](#)

GRAPHICS

- [Temperature and precipitation sites of Grand County](#)
- [Wind Map: USA](#)
- [Click here](#) for a tool that shows wind direction worldwide
- [Website - Community, Collaborative Rain, Hail & Snow Network](#) (CoCoRaHS)

TEMPERATURE, PRECIPITATION and SOIL DATA

- **MESO** (Sites can be expanded through features in left column)
- [National Weather Service Forecast Center at Grand Junction](#)
- **NRCS SCAN (lower elevation) sites** and data (Soil moisture and temperature as well as weather data)
- **NRCS SNOTEL (higher elevation) sites and data** (Snow-water equivalent, precipitation and temperature)
- [Monthly Precipitation](#)

- Regional evaporation rate is 57 inches per year

Real-time local weather

- [Big Indian Valley](#)
- [Canyonlands Air Field](#)
- [La Sal](#)
- [La Sal Mountains](#)
- [Moab/Spanish Valley](#)
- [Porcupine Canyon](#)

Meteorological Portal

- [MesoWest](#). University of Utah.

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

- [Colorado River Basin annual average temperature](#)
- [Colorado Basin Forecast Center](#)
- [Climate Services](#)

US DROUGHT PORTAL

- [Home page](#)

WESTERN REGIONAL CLIMATE CENTER

- [Climate records for Moab, Utah station](#)
- [Climate data](#)
- [Current observations and forecasts](#)

WESTERN WATER ASSESSMENT

- [Home page](#)
-

Climate Change



Thunderstorms over the Book Cliffs

CLIMATE CHANGE DOCUMENTS

- [Forest and Water Climate Adaptation: A Case Study of Moab and Castle Valley, Utah.](#) Canyonlands Watershed Council, 2010.
- [Hotter and Drier: The West's Changed Climate.](#) 2008 report from the Rocky Mountain Climate Organization on the climate patterns already changing in the American West.
- [Effects of Climate Change on Water Utilities.](#) 2012 update of likely effects of climate change on public water providers, from the Water Research Foundation.
- [Less Snow, Less Water: Climate Disruption in the West.](#) From the Rocky Mountain Climate Organization.
- [An Illustrated Guide to the Science of Climate Change Impacts.](#) Joe Romm, 2011.
- [On The Colorado website](#)

CLIMATE SOLUTIONS UNIVERSITY

- [Preparing for Climate Change: A Guidebook for Local Government](#)

CLIMATE EDUCATION

- [Climate Communications and Behavior Change Guide.](#) University of Oregon.
- [NOAA Climate Services](#)

DEPARTMENT OF INTERIOR

- Secretarial Order [3289 & 3226](#)
- [USGS Office of Climate Change](#)
- [National Park Service Climate Change Response](#)
- [Monitoring dust events in the Southwest](#)

FLOODS

- [2009 - Flood Insurance Study Grand County](#). FEMA.

FOREST SERVICE

- [2010 - Water, Climate Change, and Forests](#)

LEGAL

- [2010 - "Stationarity Is Dead" - Long Live Transformation: Five Principles for Climate Change Adaption Law. Craig.](#)
-

INTERGOVERNMENTAL AGENCIES

Climate Change Science Program (CCSP) integrates federal research on climate and global change, as sponsored by thirteen federal agencies and overseen by the Office of Science and Technology Policy, the Council on Environmental Quality, the National Economic Council and the Office of Management and Budget.

- [Home page](#)
- [Library](#)

Intergovernmental Panel on Climate Change (IPCC) was established to provide the decision-makers and others interested in climate change with an objective source of information about climate change.

- [Home page](#)
- [Reports](#)

NATIONAL ATMOSPHERIC AND OCEANIC ADMINISTRATION

- [NOAA Climate Services](#)
- [Upper Basin RISA](#); [Lower Basin RISA](#) & [here](#)

2010 - Proceedings of National Academy of Sciences

- [1,200 Year Perspective on 21st Century Drought in Southwestern North America.](#) Woodhouse et al.
 - [Water, Climate Change and Sustainability in the Southwest.](#) MacDonald et al.
 - [Reclaiming Freshwater Sustainability in the Cadillac Desert.](#) Sabo et al.
 - [Roadmap to Sustainable Water Resources in Southwestern North America.](#) Gleick.
 - [Future Dryness in Southwest & Hydrology of 21st Century Drought.](#) Cayan.
 - [Greenhouse Warming & 21st Century Hydroclimate in SW North America.](#) Seager et al.
 - [Forest Responses to Increasing Aridity & Warmth in SW USA.](#) Williams et al.
 - [Vulnerability Assessment of Climate Induced Water Shortage in Phoenix.](#) Gober et al
-

Colorado River

Photo: The Big Drops in Cataract Canyon

The annual rainfall at the Colorado River bridge near Moab City is 9 inches a year and even lower (7 inches) at the Green River bridge in Green River City.

The annual evaporation rates are greater by at least seven times.

Yet the modern-day flow of the two rivers beneath the two bridges is around 10 million acre-feet. A total average of about 11 million acre-feet enters Lake Powell every year, but consumption and climate change will continue to lower this statistic every decade hence.

None-the-less, the power of this moving water is why this landscape looks the way it does and this resource is our community's greatest gift.



BUREAU OF RECLAMATION

- [Upper Colorado River Water Operations](#)

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

- [Colorado Basin Forecast Center](#)

ON THE COLORADO (comprehensive)

- [Colorado River document & data archive](#)

US GEOLOGICAL SURVEY

- [Real-time water data](#)

WESTERN WATER ASSESSMENT

- [Colorado River supply and demand analysis](#)

OTHER

- [Map: rough sketch of Green/Colorado river divide in Grand County](#)
-

COLORADO STATE

Decision Support System

- [Home Page](#) for water governance and water rights
-

Documents

This page serves as a catchall for documents that are written by individuals or organizations, including the Canyonlands Watershed Council, that pertain to the natural and cultural resources of our watershed in southeast Utah.

Please [write](#) or [call us](#) to report a problem or add a document.

DOCUMENT SEARCH ENGINES

- [Open pdf](#)
- [Doc Stoc](#)

CANYONLANDS NATIONAL PARK

- [2009 - Economic influence of Southeast Utah National Parks.](#) National Parks Conservation Association.

CANYONLANDS WATERSHED COUNCIL

- August 2009 - [Change in Land Use Code for Conditional Use Permits](#)
- October 2009 - [Reasons for moratorium on oil & gas wastewater acceptance](#)

CLIMATE

- 2008 - [Sensitivity of the Colorado Plateau to Change: Climate, Ecosystems, and Society.](#) Schwinning et al.

CONTROVERSIES

- [Four Corners: A National Sacrifice Zone?](#)

GRAND COUNTY and CITY

- [2008 - Smart Growth.](#) Scott.



The white rim in Canyonlands National Park

- [2009 - Draft Proposal for a watershed ordinance.](#)

MILL CREEK

- [Mill Creek Partnership Minutes.](#) Record of EPA sole-source aquifer designation.
- [Mill Creek Partnership website](#)

RESTORATION

- [2011 - Ecological values of beavers in Esclanate Watershed.](#) ECONW.

SUSTAINABILITY

- [2004 - The Precautionary Principle Handbook.](#)
- [2010 - A Renewable Deal For USA.](#) Lance Christie.

TAMARISK

- 2009 - [Tamarisk Biocontrol in Western US: Ecological and Societal Implications.](#) Hultine et al.
-

Dolores River

ARCHEOLOGY

- [Dolores River Project](#)

BIOLOGICAL OPINIONS

- [1980 - Biological Opinion, Dolores River Project](#)

ENDANGERED FISH

- [1992 - Dolores River Native Fish Habitat Study](#). Valdez, et al.

MANAGEMENT

- [Dolores River & San Juan Framework](#). Colorado Water Conservation Board.

MAPS

- [USGS map at Dewey in 1958](#)
 - [Dolores Watershed](#). San Juan Citizen's Alliance.
-

Economy

DOCUMENTS

- The Congressional Budget Office published this [report](#) on the federal debt crisis.
- [List of publications by CERES](#)
- [2004 - The Precautionary Principle Handbook](#)
- [2009 - Utah's Economy: The Future Is Here.](#)
- [2011 - Grand County Report](#). Headwaters Economics.
- [2011 - Summary of Grand County Report](#). Headwaters Economics.
- [2011 - Ways That Watersheds Provide Values](#). Headwaters Economics.
- [Agenda 21 for Sustainable Development](#). United Nations.
- [2012 - Grand County Workshop](#). BLM.
- [2015 - Grand County Report](#). Headwaters Economics.
- [2023 - Amenity Trap: How High Amenity Communities Can Avoid Being Loved To Death](#). Headwaters Economics.

BOOKS

[2010 - A Renewable Deal for the United States](#). Lance Christie.

WEBSITES

[Headwater Economics](#)

[Earth Charter Initiative](#)

[The International Society for Ecological Economics](#)

[The Gund Institute for Ecological Economics](#)

[The Center for Ecoliteracy](#)

[World Changing](#)

[Living Principles](#)

[Post Carbon Institute](#)

[Sustainability Institute](#)

[SustainAbility](#)

[Sustainable Communities online](#)

CWC supports the six principles of the steady state economy as detailed by [Herman Daly](#), and summarized here:

- 1. Renewable resources: harvest rates should equal regeneration rates (sustained yield).
- 2. Waste emission rates should equal the natural assimilative capacities of the ecosystems into which the waste are emitted.
- 3. Maintain natural and manmade capital intact at the optimal level. (Principles 1 and 2 accomplish this for natural capital.)
- 4. Investment in the exploitation of a nonrenewable resource should be paired with a compensating investment in a renewable substitute.
- 5. Emphasize technologies that increase resource productivity (development), the amount of value extracted per unit of resource, rather than technologies for increasing the resource throughput itself (growth).
- 6. Limit the total scale of resource throughput to ensure that the scale of the economy (population times per capita resource use) is within the carrying capacity of the region, avoiding capital consumption.
- [Article](#) explaining the steady state economy by Herman Daly.
- This [paper](#) by John Williams explains the present economic situation well.
- Report: [Prosperity without growth](#)

SOLUTIONS

- [2023 - Amenity Trap: How High Amenity Communities Can Avoid Being Loved To Death](#). Headwaters Economics.
-

Education



Educational opportunities in Canyon Country are diverse with levels of involvement from all sectors: private, public and non-profit.

AFTER SCHOOL PROJECTS

- [Friends of the Club Red Moab Teen Center](#)
- [Moab Beacon](#)
- [Native American Club](#)
- [Youth Garden Project](#)

ALTERNATIVE EDUCATION

- [Arches Education](#)
- [Day Star Adventist Academy](#)
- [Moab Charter School](#)
- [Green Cup Challenge](#)

OUTDOOR EDUCATION

- [Canyon Country Outdoor Education](#) (National Park Service)
- [Canyonlands Field Institute](#)
- [Four Corners School of Outdoor Education](#)

PUBLIC EDUCATION

Grand County

- [Board of Education](#)
- [Grand County School District](#)
- [Grand County High School](#)

- [Grand County Middle School](#)
- [Grand County Intermediate School](#) (HMK)
- [Grand County Elementary School](#) (Red Rock)

San Juan County

- [San Juan County School District](#)
- [San Juan County Schools K-12](#)

UNIVERSITY

- [Utah State Extension](#)
 - [Utah State University Extension Grand County](#)
 - [Utah State University Extension San Juan County](#)
-

Emery County



The “castles” of Emery County

EMERY COUNTY

- [Emery County home page](#)
 - [Emery County building and zoning](#)
 - [Emery County zoning ordinance](#)
 - [Emery County land use information](#)
-

Energy



Solar array at Natural Bridges National Monument

See also [Oil & Gas](#)

At present the production of energy resources in southeast Utah is not a robust industry, nor is it innovative or resilient, except for a few scattered solar arrays on private homes and public facilities. There is a [uranium ore reduction mill](#) near Blanding that sits idle most of the time, and a few oil and gas wells near Moab and Bluff that are more annoying than productive.

However, energy products from other places pass through our convenient corridors everyday in the form of trucks, pipelines and transmissions lines, which may or may not increase, depending on the implementation of various national policies.

Very soon things could change here, as two controversial steam-powered (thermal), electric generation stations near Green River City have been proposed. One proposal includes a [nuclear reactor](#) and the other a [coal-gasification plant](#).

These additions to the national power grid would be necessary to meet traditional energy production demands for other proposed projects near our watershed. For example, to extract oil and gas from the huge [oil shale reserves](#) found to the immediate north in the Uinta Basin.

[Uranium ore extraction](#) is another troubling development for our community.

Such energy development will wreak havoc on the scarce water supplies of the Colorado River and destroy what watershed integrity yet remains.

The Canyonlands Watershed Council supports energy development that does not engage in the use of fossil and nuclear fuels.

WEBSITES

Alternatives

- [Transitions to Alternative Vehicles and Fuels. 2012. National Resource Council.](#)
- [Journal: Energy Policy. 1973 -2013.](#)
- [Stanford: Woods Institute for the Environment](#)
- [Stanford: PrecourtInstitute for Energy](#)

Federal

- [Office of Electricity Delivery & Energy Reliability](#)
- [USDA rural development programs](#)
- [Energy Star](#)
- [Strategic Unconventional Fuels Task Force](#)

State

- [Utah Energy Advisor](#)
- [Utah weatherization assistance program](#)
- [2010 - Governor's 10-year Energy Plan \(Draft\).](#)
- [2011 - Governor's 10-year Energy Plan \(Final\).](#)
- [2013 - Utah's Water Future: 50-year Strategy](#)
- [Home page: Governor's Energy Plan](#)
- [Documents and comments of Governor's Energy Plan](#)
- [2011 - Utah's Energy Landscape.](#) UGS.
- [Energy Water Nexus for Utah](#)
- [2014 - Utah Coal: A Report and Scenario Plan.](#) Rural Planning Group.

City

- [Green Power in Moab.](#) City of Moab.
- [Doing the right thing.](#) KZMU

Corporate

- [Renewable Energy Program.](#) Rocky Mountain Power.
- [Going Solar](#)

Non-profit

- [Utah Clean Energy](#)
- [Clean Energy Action](#) (Colorado)
- [Post Carbon Institute](#)
- [Clean Energy Leadership](#). Headwater Economics.

Nuclear Power Plants

- [2012 - Dangers of living near nuclear facilities](#). NAS.
- [2013 - Transcript of HEAL Utah et al. vs. Blue Castle Holdings](#) (Green River Nuke)

REPORTS

- [1976 - The Quest for Energy: Socio-Economics and Environmental Impacts](#). League of Women Voters.
 - [2009 - Utah's Energy Landscape](#). UGS.
 - [2009 America's Biggest Polluters: Carbon Dioxide Emmissions from Power Plants in 2007](#). Arizona Environment.
 - [2009 - Innovation Policy for Climate Change](#)
 - [2009 - Carbon Dioxide Sequestration](#). Southwest Hydrology.
 - 2009 - Blueprint for clean energy economy ([Executive Summary](#)) ([Full Report](#)). Union of Conserved Scientists.
 - [2009 - Evaluating the Feasibility of a Large-Scale Wind, Water, and Sun Energy Infrastructure](#). Jacobson & Delucchi.
 - 2010 - [eUtah](#). Heal Utah. (Documents combined).
 - [2013 - Executive Summary: Tar Sands Oil Shale Market Assessment](#). U of U.
 - [2013 - Oil Shale Market Assessment](#). U of U.
-

Environmental Protection Agency (EPA)



EPA designated Moab as a Green Power Community

The [National Environmental Policy Act](#) was signed into law by President Nixon on January 1, 1970 and the [Environmental Protection Agency](#) was created on December 2, 1970. The mission of the agency is to protect human health and the environment. In 2004 the EPA designated Moab as the nation's first [clean energy community](#). The upper basin of the Colorado River, including Utah is in [Region 8](#) and the lower basin of the Colorado River is in [Region 9](#). New Mexico is in [Region 6](#).

[History of the EPA](#)

ENVIRONMENTAL PROTECTION AGENCY

- [Fundraising](#)
- [Growth and Water Resources Fact Sheet](#)
- [Handbook for Developing Watershed Plans to Restore and Protect Our Water](#)
- [Surf Your Watershed](#)
- [Watershed Mapping](#)
- [Watershed Planning](#)
- [303\(d\) list - Total Maximum Daily Loads \(TDML's\)](#)
- [List of hazardous air pollutants](#)

MOAB'S SOLE-SOURCE AQUIFER PROTECTION PLAN

- [Geologic Data](#)
- [Color Map](#)

- [Legend: Color Map](#)
- [Mill Creek Partnership documents](#)
- 2001 - [Drinking Water Source Protection Plan](#)
- 2001 - [Drinking Water Source Protection Plan](#)
- 2001 - [Skakel Springs Drinking Water Source Protection Plan](#)
- 2002 - [Drinking Water Source Protection Plan](#)
- 2002 - [Federal Register: Glen Canyon Aquifer SSA](#)
- 2008 - [Letter to Moab City](#) regarding development on aquifer recharge zones.
- 2008 - [Response from Moab City regarding development on aquifer recharge zones](#)

SEE ALSO: [Moab City](#)

Events



Wabi Sabi's Helper Art & Music Festival

KZMU COMMUNITY RADIO

- [Public Service Announcements](#)

MOAB ARTS AND RECREATION

- [Calendar](#)

MOAB HAPPENINGS MAGAZINE

- [Events Calendar](#)

WABI SABI

- [Events](#)
-

Floods



1921 snow melt at camera station near Courthouse Wash

YES! Canyonlands Watershed Council is a charitable organization.
You can donate to CWC using our PayPal Console [HERE](#)

FLOODS IN GRAND COUNTY, MOAB CITY & COLORADO RIVER BASIN

Visit: [On The Colorado](#) for a more detailed list of flood related publications.

- [1929 - Floods of the Upper Colorado](#). Follensbee.

UMTRA STEERING COMMITTEE MEETING (January 24, 2017)

- Handout 1: [Summary by John Weisheit](#)
- Handout 2: [Photo of slackwater deposits with legend \(line art\)](#)
- Handout 3: [Photo of slack water deposits with legend of flow in cubic meters per second](#)
- Handout 4: [1921 - Photo of Colorado River in flood near Moab](#)
- Handout 5: [2005 - Moab's Colorado River floodplain: extent of 300,000 cfs flood event](#). John Dohrenwend.
- Recommended reading: [2006- A technical report towards reclaiming uranium mill tailings along the Colorado River in Grand County, Utah.](#)
- Recommended reading: [2014 - 2000 Year Record of Magnitude and Frequencies of Largest Upper Colorado River Floods at Moab, Utah.](#) Greenbaum et al.
- Recommended reading: [2014 - Paleoflood Hydrology of Stillwater Canyon, Green River and Cataract Canyon, Colorado River](#) (preliminary results). Greenbaum, et al.

DOCUMENTS

- [1944 - Water Supply Paper 918.](#) USGS; Dickinson.
- [1948 - Floods in Colorado.](#) USGS; Follansbee.
- [1946 - Cloudburst floods in Utah.](#) Woolley. US Geological Survey.
- [1962 - Floods in Utah: Magnitude and Frequency.](#) Berwick.
- [1976 - Narrative of flooding in Moab.](#) McConkie-Tanner.
- [2002 - Discussion: the flood of 1884 and the flood of 1983.](#) Swain; Bureau of Reclamation.
- [2003 - Investigation of the Hydrogeologic Connection between the Moab Mill Tailings and the Matheson Wetland Preserve.](#) Philip Gardner and D. Kip Solomon.
- [2004 - Initial-Phase Investigation of Multi-Dimensional Streamflow Simulations in the Colorado River, Moab Valley, Grand County, Utah.](#) Terry A. Kenney, US Geological Survey.
- [2005 - Special newspaper supplement about the Moab Mill Project.](#) Moab Times-Independent.
- [2006 - Moab Mill Site special presentation at the Moab Information Center.](#) John C. Dohrenwend.
- [2006- A technical report towards reclaiming uranium mill tailings along the Colorado River in Grand County, Utah.](#)

- [2010 - Flooding in the Dolores River Basin, Colorado and Utah: Insights from Paleofloods, Geochronology and Hydroclimatic Analysis](#). Cline.
- [2014 - 2000 Year Record of Magnitude and Frequencies of Largest Upper Colorado River Floods at Moab, Utah](#). Greenbaum et al.
- [2014 - Paleoflood Hydrology of Stillwater Canyon, Green River and Cataract Canyon, Colorado River](#) (preliminary results). Greenbaum, et al.

WEBSITES

- [Grand County UMTRA Project](#) (uranium mill tailings removal).

GRAPHICS

- [1921 - Photo of Colorado River in flood near Moab](#)
- [2005 - Moab's Colorado River floodplain: minimum extent of gravel bars](#). John Dohrenwend.
- [2005 - Moab's Colorado River floodplain: extent of 300,000 cfs flood event](#). John Dohrenwend.
- [Photo of slackwater deposits with legend \(line art\)](#)
- [Photo of slack water deposits with legend of flow in cubic meters per second](#)

BRIEF ANALYSIS:

PALEOFLOOD RECORD OF COLORADO RIVER ABOVE MOAB

[2014 - 2000 Year Record of Magnitude and Frequencies of Largest Upper Colorado River Floods at Moab, Utah](#). Greenbaum et al.

The purpose of the study, performed by University of Arizona (Tucson) under the direction of Victor Baker, John Dohrenwend and Noam Greenbaum, was to provide rigorous data to stakeholders and decision-makers to help ensure the removal of Moab's uranium waste pile from the floodplain of the Colorado River, which is indeed happening. So far, 50% of the pile has been removed and taken by railroad to a burial site 30 miles north of town at a location called Crescent Junction adjacent to the I-70 corridor. The funding for this paleoflood project was provided by The Citizens' Monitoring and Technical Assistance Fund.

After the report was published, paleoflood research has continued in the upper basin of the Colorado River. For example, in 2010, sites along the Dolores River were located and sampled. In 2010 and 2012, sites were located and sampled in Stillwater Canyon on the lower Green River, and in Cataract Canyon below the confluence of the Green and Colorado rivers. Work in the near future will occur in Grand Canyon.

Highlights of this report include:

- **River section:** Upper Colorado River (above the Green River confluence and below the Dolores River, the last major tributary)
- **Site location:** 10.5 miles above the Moab Bridge
- **Time frame:** The last 2,140 years (+/- 220 years)
- **Number of floods:** 44
- **Range of floods in cfs:** 60,036 to 349,616
- **34 - 40 floods:** exceeded the magnitude of the USGS 100-year flood determination
- **20 - 25 floods:** exceeded the magnitude of the USGS 500-year flood determination
- **5 floods:** exceeded a peak discharge of 282,000 cfs
- **Largest floods:** two were slightly over 349,000 cfs
- **100-year flood:** peak discharge ranging from 156,440 to 179,050 cfs
- **500-year flood:** peak discharge ranging from 224,780 to 265,570 cfs
- **1000-year flood:** peak discharge ranging from 256,740 to 310,770 cfs

ADDITIONAL INFORMATION

- [Updated Report \(2006b\)](#)
 - [Moab Mill Project Cover Letter](#)
 - [Moab Mill Project Brochure](#)
 - [Moab Mill Project Poster](#)
 - [1994 - Paleoflood study of Colorado River at Grand Canyon](#). O'Conner et al.
 - [Click here](#) to read Dam Failure Inundation Study by the Bureau of Reclamation (1998).
 - [Click here](#) to learn more about the flood of 1884 and the flood of 1983
-

Food



Manzana Springs vegetable farm in Moab

See also [Permaculture](#)

COMMUNITY SUSTAINABLE AGRICULTURE

- [Manzana Springs Vegetable Farm](#)
- [Sol Food Farms](#)

WEBSITES

Non-Profit

- [10 in 10 Diet](#). Sustainable food preparation.
- [Community Food Security Coalition](#)
- [Food Security Statistics](#)
- [Deconstructing Dinner](#)
- [Food and Farming Transistion](#). Post Carbon Institute.
- [Union of Concerned Scientists](#)
- [Southwest Marketing Network](#)

Universities

- [Food security and safety](#). Utah State University
- [Center for Food Security and Public Health](#). Iowa State University.

Utah State

- [Food banks](#)
- [Nutrition Education](#)

Federal

- [USDA rural development programs](#)
- [USDA food security program](#)
- [USDA food safety program](#)

United Nations

- [Food and Agriculture Organization](#)

SOIL

- [Canyonlands Soil Survey](#)
-

Forests



La Sal Mountains with the Abajos (Blue) Mountains in the distance

The forests of southeastern Utah are threefold: the pine/aspen canopy of laccolithic mountains, the juniper/pinyon cover of high plateaus, and the willow/cottonwood galleries of riparian corridors. The connection of these forest canopies with our water resources in arid lands is of vital importance.

The **Manti-La Sal National Forest** manages the La Sal and Abajo Mountains. The **Bureau of Land Management** manages the Henry Mountains and the majority of the high plateaus and riparian corridors. Navajo Mountain is managed by the **tribal government** of the Navajo Nation. The remainder is managed by **Utah State** and the **National Park Service**.

Forest Service Rulemaking

- [Documents and appendices](#)
- [Forest Service rulemaking home page](#)
- [Notice of new rulemaking for national forests](#)
- [Federal Register Notice](#)
- [USDA rulemaking blog](#)
- [Meeting schedule](#)

DOCUMENTS

- [1986 - 2000 forest plan](#) (cache of [plan](#) & [amendments](#))
- [2004 - Strawberry Watershed Restoration Report](#). USFS.
- [2005 - Moab face analysis final](#)
- [2007 - Groundwater Drinking Water Source Protection Zones and Sole Source Aquifers on the Moab Unit Manti LaSal NF](#)
- [2009 - Fire related debris flows in Northern Utah](#). Richard E. Giraud et al.
- [2009 - Tushar Grazing Allotment](#) (Fishlake National Forest).

- [2010 - Solutions to the Rising Costs of Fighting Fires in the Wildland-Urban Interface](#). Headwaters Economics.
- [2010 - Strategic Plan](#).
- [2010 - Water, Climate Change, and Forests](#).
- [2010 - Getting Burned: Guide to Wildfire Suppression](#). FUSEE.
- [Forest Responses to Increasing Aridity in SW USA](#). Williams et al.
- [2011 - Ecological values of beavers in Esclanate Watershed](#). ECONW.
- [2011 - Watershed Condition Framework](#). USFS.
- [2011 - Brumley Ridge Grazing Alternatives](#). USFS.

WATER MANAGEMENT

- [2007 - Groundwater, Drinking Water and Sole Source Aquifers on the Moab Unit](#). Foster. ([cache](#))

WILLOW BASIN

- [2005 - Willow Basin fire prevention](#). Letter to residents.
 - [2007 - Willow Basin scoping Letter](#)
 - [2007 - Willow Basin public notice](#)
 - [2007 - Willow Basin public notice correction](#)
 - [2008 - Willow Basin proposed action](#)
 - [2008 - Willow Basin injunction notice](#)
 - [2008 - Willow Basin public meeting announcement](#)
 - [2009 - Willow Basin environmental assessment](#)
 - [2009 - Need and Purpose](#)
 - [2010 - Willow Basin: Desired Future Conditions](#)
 - [2010 - Draft Wildland Urban Interface Fuel Reduction Project](#)
 - [2010 - Maps of Wildland Urban Interface Boundary](#)
-

Fracking

See also [Oil & Gas Section](#)

[Well information search](#). Utah Oil, Gas and Mining.

ARCHIVES

[Intermountain Oil and Gas Project](#). Getches-Wilkenson Center.

DOCUMENTS

- [EPA web site on hydraulic fracturing](#).
- [1987 - Management of Wastes from Production of Oil & Gas](#). EPA.
- [2002 - Exemptions Oil & Gas Exploration Production Wastes](#). EPA.
- [2004 - Oil & Gas impacts to water resources in New Mexico](#). Shomaker & Assoc.
- [2008 - Health risks of oil & gas development](#). University of Colorado.
- [2008 - Conclusions & recommendations of white paper](#). University of Colorado.
- [2008 - Chemical analysis of gas production wells](#). [ExCel file here](#). The Endocrine Disruption Exchange.
- [2010 - Methane Greenhouse Gas Footprint From Shale Formations](#). Howarth et al.
- [2010 - Fracking The Future](#). DeSmog Blog.
- 2011 - [Hydraulic fracking chemicals](#). US Congress.
- [Fracking chemicals](#). HCN.

Working and Proposed Wastewater Facilities

NEW INFORMATION: Danish Flats

See also this [ARTICLE](#) about Danish Flats

- [March 25, 2012 - Revised NOI](#)
- [Website of Danish Flats Environmental Services, Inc.](#)
- [Danish Flats satellite image](#)
- [2010 - Draft NOI for Emissions Analysis](#)
- [Site Processing and Equipment](#)
- [Non-compliance letter from UDOGM](#)
- [GRAMA: eMail correspondance](#)
- [GRAMA: Email attachments](#)

- GRAMA: spreadsheets [1](#) & [2](#) & [3](#) & [4](#)
- [Memo between Danish Flats and Redrock Forests](#)
- [2011- Report on impacts to birds and bats](#)

Other Harley Dome and Westwater Area Facilities

- [2006 - Modifications at Harley Dome](#)
- [Summit Operating LLC at Harley Dome](#) & [\(News clipping\)](#)
- [2009 - Summit Operating Permit Application](#)

Hydrocarbon Heaven Cisco Development

- [2008 - Hydrocarbon Heaven?](#) Kamala.

School and Institutional Trust Lands Administration (SITLA)

NEW INFORMATION: Westwater Farms

Class II Injection Well Application

- [USGS topo map of Harley Dome and Bitter Creek](#)
- [Satellite image of Harley Dome and Bitter Creek](#)
- [USGS topo with potential monitoring wells located](#)
- [Abandoned wells in 1/2 mile radius](#)
- [Satellite image with potential monitoring wells located](#)
- [Map of affected area](#)
- [2009 - Application to drill; Wastewater injection rules.](#)
- [2009 - Westwater Farms hydrogeology report.](#) Wayne Downs.
- 2009 - Letter from citizen groups. Proposed operations at Westwater Farms.
- [2010 - Photos of Westwater Farms](#)
- [2010 - Request for formal hearing](#)
- [2010 - Motion for formal hearing](#)
- [Public Notice: November, 2010.](#)
- [2010 - MAP: Harley Dome and Westwater Area](#)
- [2010 - Staff Report: Grand County Planning Commission](#)
- [2010 - Audio of Westwater Farms Public Hearing](#) (Dec. 8)
- [2011 - County planning approves conditional use permit](#) (Times-Independent Jan. 27)

- [2011 - County schedules Westwater Farms vote for March 1.](#) (Times-Independent)

Stewart Environmental Consultants (Westwater Farms Partner)

- [2009 - Beneficial Use of Produced Water.](#) IPEC.
- [2010 - Presentation to Grand County Planning](#)
- [2010 - Conditional Use Permit Application](#)
- [Map of affected area](#)
- [Pre-treatment schematic](#)
- [Water Chemistry Memo](#)
- [Injection Well Monitoring Program](#)
- [Down's Geologic Report](#)
- [Injection Well Monitoring Program](#)
- [Memo Response Letter](#)
- [Ordinance Report Part 01](#)
- [Ordinance Report Part 02](#)
- [Permit Application Part 01](#)
- [Permit Application Part 02](#)
- [Permit Application](#) ([searchable pdf](#))
- [Permit Review Letter.](#) Fish and Wildlife Service.
- [Protest Letter.](#) BLM.
- [Protest Withdrawal.](#) BLM.
- [UDOGM Staff Memo.](#)
- [Westwater Canyon Monitoring Letter](#) (19 Nov 2010)
- [Log for Westwater Harley Dome.](#) Halliburton.

Westwater Farms in the news

- [January 27, 2011 - PC recommends county approve Westwater Farms](#)
-

Geology

John Wesley Powell said that geology "is the noblest of the sciences," because he understood its connection with every other discipline. Many of America's finest geologists made significant contributions after completing comprehensive studies on the Colorado Plateau; it is a very famous place.

Grove K. Gilbert, probably America's most respected geologist, noted that the study of most landscapes are very difficult, because they are covered by water, soil, plants, or even ice and snow. But not so for the Colorado Plateau! Probably no other landscape on earth has this much exposed bedrock.

Physical geology is what these men taught and it is a fascinating natural history which requires no special tools; just keen observation. For their story is about a landscape created and then destroyed; destroyed by the erosive power of a vigorous river. Who would ever think that such destruction could be so beautiful?

AGENCY WEB PAGES

- [Publications and maps from Utah Geologic Survey](#)
- [Utah Geologic Survey publication search engine](#)
- [Publications and maps from US Geological Survey](#)
- [Geology of Canyonlands National Park](#)

BIBLIOGRAPHIES

- [Uinta Basin](#)

PHYSICAL GEOLOGY

- [1875 - Exploration of the Colorado River & Its Tributaries](#). John Wesley Powel.
- [1876 - Expedition from Santa Fe to the Junction of the Grand and Green Rivers in 1859](#). John Macomb and John S. Newberry.
- [1956 - Cenozoic Geology of Colorado Plateau](#). Hunt.
- [1962 - Quaternary Stratigraphy of La Sal Mountains](#). Richmond.
- [1985 - Investigations of Paradox Formation for Nuclear Waste Repository](#). UGS.
- [1992 - Soil and Rock Causing Engineering Problems in Utah](#). UGS.
- [2000 - Geology of Dead Horse Point](#). Doelling.
- [2003 - Geologic Hazards of Moab-Spanish Valley](#). [Plate 01](#); [Plate 02](#); [Plate 03](#); [Plate 04](#). UGS.

GROUNDWATER

- [USGS groundwater monitoring in Grand County](#)
- [1965 - Grand Junction Area Geology and Artesian Water](#). Lohman.

- 1971 - [Geology and water resources of the Spanish Valley area, Grand and San Juan Counties, Utah](#). US Geological Survey. Sumsion.
- 1972 - [Groundwater Hydraulics](#). Lohman.
- 1977 - [A digital model of ground-water flow in Spanish Valley, Grand and San Juan Counties, Utah](#). US Geological Survey. Eychaner.
- 1990 - [Ground-water conditions in the Grand County area, Utah, with emphasis on the Mill Creek-Spanish Valley area](#). US Geological Survey. Blanchard.
- 1991 - [Geohydrology of Mesozoic rocks in the upper Colorado River basin in Arizona, Colorado, New Mexico, Utah and Wyoming, excluding the San Juan basin](#). US Geological Survey. Freethey et al.
- 1994 - [Solution-collapse Breccia Pipes Moab & Spanish Valley](#). USGS.
- 1996 - [Recharge area and water quality of the valley-fill aquifer Castle Valley, Grand County](#). UGS.
- 1997 - [Map of recharge areas for the Glen Canyon and valley-fill aquifers, Spanish Valley area, Grand and San Juan Counties, Utah](#). US Geological Survey. Steiger et al.
- 1999 - [A summary of the ground-water resources and geohydrology of Grand County, Utah](#). Utah Geological Survey. Eisinger et al.
- 2000 - [Geohydrology and numerical simulation of ground-water flow in the central Virgin River basin of Iron and Washington Counties, Utah](#). (aquifers in Navajo Sandstone). US Geological Survey. Heilweil et al.
- 2001 - [Reconnaissance study of age and recharge temperature of groundwater near Moab, Utah](#). University of Utah. Kip Solomon.
- 2004 - [Ground-water quality classification and recommended septic tank soil-absorption-system density maps, Castle Valley, Grand County, Utah](#). Lowe, USG. (Plates)
- 2007 - [The Hydrolgeology of Moab-Spanish Valley, Grand and San Juan Counties, Utah, with emphasis on maps for water-resource management and land-use planning](#). Utah Geological Survey. Lowe et al. [Plates 1-12](#). [Septic recommendation map](#).
- 2007 - [Aquifer recharge map \(USG\) & alternative version \(USGS\)](#).
- [Septic tank recommendation map](#)
- 2008 - [Ground-water sensitivity and vulnerability to pesticides, Moab-Spanish Valley, Grand and San Juan Counties, Utah](#). Lowe, USG. (Plates included)
- 2009 - [Simulation of Ground-Water Flow and Solute Transport in the Glen Canyon Aquifer, East-Central Utah](#). Freethey.
- 2018 - [Hydroogic and Hydrogeologic Assessment of the Surface Water and Groundwater Resources Affecting the Moab City Springs and Wells, Moab, Utah: Phase 1: Hydrologic and Environmental System Analysis \(HESA\) and Conceptual Models](#). Kolm & Heijde.

HYDROLOGY

- [Water Supply Papers for Utah](#)
- 1946 - [Cloudburst floods in Utah](#). Woolley. US Geological Survey.

- [2004 - Initial-Phase Investigation of Multi-Dimensional Streamflow Simulations in the Colorado River, Moab Valley, Grand County, Utah](#). Terry A. Kenney. US Geological Survey.
- [2006 - The Moab Mill Project](#). A technical report toward reclaiming uranium mill tailings along the Colorado River in Grand County, Utah. Living Rivers.
- Click [here](#) for more hydrology reports

MOAB'S SOLE-SOURCE AQUIFER PROTECTION PLAN

- [Geologic Data](#)
- [Color Map](#)
- [Legend: Color Map](#)
- 2001 - [Drinking Water Source Protection Plan](#)
- 2001 - [Drinking Water Source Protection Plan](#)
- 2001 - [Skakel Springs Drinking Water Source Protection Plan](#)
- 2002 - [Drinking Water Source Protection Plan](#)
- 2008 - [Letter to Moab City](#) regarding development on aquifer recharge zones. EPA.
- 2018 - [Hydroogic and Hydrogeologic Assessment of the Surface Water and Groundwater Resources Affecting the Moab City Springs and Wells, Moab, Utah: Phase 1: Hydrologic and Environmental System Analysis \(HESA\) and Conceputual Models](#). Kolm & Heijde.

SOIL

- [Canyonlands Soil Survey](#)
-

Geographic Information System (GIS)



Colorado River near Jackson Hole

To view some of the files provided here, it will be necessary to [download Google Earth](#), which is free software (open source) provided by Google, Inc., and for all kinds of operating systems (Microsoft, Mac, Linux).

Tutorials about getting started are [provided here](#).

If you already use Google Earth, make sure you have [updated your software](#).

Second, you must download the .kmz files to your computer and launch them via Google Earth. Double-clicking the icon (shortcut) may not work until you change your settings (preferences) to make Google Earth your default (priority) application.

[Advanced tutorials](#)

More files will be added soon and existing files will be enhanced.

###

Also check out our [Maps](#) section

[Visit the state of Utah's GIS Portal](#)

GRAND COUNTY

- [Grand County Boundary](#)
- [Hydrologic Unit 12](#)
- [Hydrologic Unit 12 Subbasins](#)
- [Watersheds within the boundaries of Grand County](#)
- [Grand County watersheds shared with other counties](#)
- [Tar Sands 01. BLM Programmatic EIS.](#)

- [Tar Sands 02](#). BLM Programmatic EIS.
- [Synopsis](#). John C. Dohrenwend.
- [Possible extent of energy corridor in Moab](#). Dohrenwend.

UNIVERSITY OF UTAH

- [Interactive Map of Fossil Fuels](#)

UTAH STATE GOVERNMENT

- [Precipitation Map](#)
-

Grand County



Corona Arch

Grand County has a land area of 3,682 square miles and the estimated population is 9,589 (2008), which is 2.3 people per square mile. As of the census in 2000 the county seat, Moab, had a population of 4,779, and Castle Valley had a population of 349.

There is more state land (SITLA) in Grand County by percentage, than any other county in Utah, infact 14.9% of Grand County (about 550 sq miles) is owned by SITLA. More than half of the SITLA land in Grand County (about 280 sq miles) is concentrated in one contiguous mass in north central Grand County (along the southern margin of the Uintah basin, along the crest and on the northward dipping slopes of the Roan/Book Cliffs)

CONTACT INFORMATION

- [Telephone directory](#)

DEMOGRAPHICS

- [Fact Sheet](#)
- [Grand County](#). Southeastern Utah Association of County Governments.

AGRICULTURE

- [1974 - Agriculture Development Project for Grand County & San Juan County.](#) Schick International.

ECONOMICS - See Economy

FLOODS

- [2009 - Flood Insurance Study Grand County.](#) FEMA.

WEB PAGES

- [Grand County Council](#)
- [Grand County Planning and Zoning](#)
- [Southeastern Utah Association of Local Governments](#)

BOARD OF ADJUSTMENTS

- [2008 - Bylaws](#)

GRAND COUNTY DOCUMENTS

- [1937 - Inventory of county documents](#)
- [General Plan Update website](#)
-

Grand County Planning

- 1996 - [Public Facilities Analysis](#)
- 1996 - [General Plan](#)
- 2000 - [Grand County Land Use Code](#)
- 2004 - [General Plan Update](#)
- 2008 - [Spanish Valley Transportation Plan](#)
- 2008 - [Amended Land Use Code](#)
- 2009 - [Request for proposal to update general plan](#)
- [2010 - Terms of Contract for General Plan Update](#)
- [2010 - Handout for General Plan Update working group](#)
- [2011- Grand County General Plan DRAFT](#)

Comments from Canyonlands Watershed Council on the 2011 General Plan Update. (Under Construction)

- First Letter
- Second Letter
- Third Letter

Johnson's Up-On-Top (Cloudrock)

- 2000 - [Moab Land Company: Cloudrock Preliminary Plan](#)
- 2001 - [Moab Land Company: Cloudrock Preliminary Plan](#)
- 2006 - [SITLA lease agreement with Leucadia](#)
- 2007 - [PUD Summary Amendment](#)
- 2007 - [Amended Agreement](#)
- 2007 - [Cloudrock Final Plat Phase 1a](#)
- 2008 - [A Look at Johnson's Up-On-Top](#). Grand County Citizens for Clean Water.
- 2008 - [Second and Reinstated Development Agreement](#)
- 2008 - [Cloudrock development withdrawal letter](#)
- [Graphics of Johnson's Up-On-Top](#). Includes satellite imagery of the local topography, overlays of the Cloudrock infrastructure, location of the springs and wells, the direction of groundwater flow, and fractures in the Navajo Sandstone.
- [2010 - Utah Supreme Court Decision on Cloudrock Development](#).

GRAND COUNTY WATER CONSERVANCY DISTRICT Grand Water & Sewer Service Agency Spanish Valley Water and Sewer Improvement District

- Water right docs - [#05-475](#); [#05-1062](#); [#05-1285](#)
- [Click here](#) to view City of Moab Water Documents
- [MAP: Moab & Spanish Valley Service District of GCWCD](#)
- [MAP: Ground-water Wells of Grand County](#)
- [2002 - List of Expenses](#). GWSSA.
- [2002 - Draft of Ground Water Monitoring Plan](#). GWSSA.
- [2002 - George White Well Monitoring Agreement](#)
- [2002 - Moab City Concerns of Change Application](#)
- [2002 - Moab City Revenue Analysis](#)
- [2002a - Moab Protests Change Application](#)

- [2002b - Moab Protests Change Application](#)
- [2002 - Kirk DeFond Document Supporting Protest](#)
- [2002 - Water Rights Inventory of GCWCD](#)
- [2002 - Water Rights at Chapman Well & Highland Hills Well](#)
- [2002 - Water Rights at Ken's Lake](#)
- [2002 - George White Monitoring Wel.](#) GWSSA.
- [2002 - OpEd about Change Application:](#) Sam Taylor.
- [2002 - Response to Taylor's OpEd.](#) Kyle Bailey
- [2002 - Change Application: Moab City Response to GCWCD](#)
- [2003 - What Is Water Worth? \(Moab & Spanish Valley\).](#) Pierson.
- [2003 - Change Application Approval.](#) State Engineer.
- [2004 - Lance Christie & University of Utah Analysis of Ground-water](#)
- [2004 - Bill Love Analysis of Increasing Aquifer Recharge](#)
- [2004 - Septic Tank Analysis.](#) UGS.
- [2005 - Water Resources of the Moab/Spanish Valley Area](#)
- [2008 - 40-year plan](#)
- [2009 - Water Conservation and Management Plan](#)
- [2013 - Proposal for Reduced Flow of Mill Creek.](#) GWSSA.
- [2016 - Water Master Plan.](#)
- [2023 - 40-year water plan.](#) GWSSA.

MOAB IRRIGATION COMPANY

- [Homepage](#)
- [MIC Water Rights Itemized](#)

MAPS

- [County Zoning Map](#)
- [Map: rough sketch of Green/Colorado river divide in Grand County](#)

MILL CREEK PARTNERSHIP

[Mill Creek Partnership website](#)

ORDINANCES

- 476 - [Oil and gas wastewater](#)

ROADS

- [2015 - Bookcliffs Transportation Corridor Study](#)

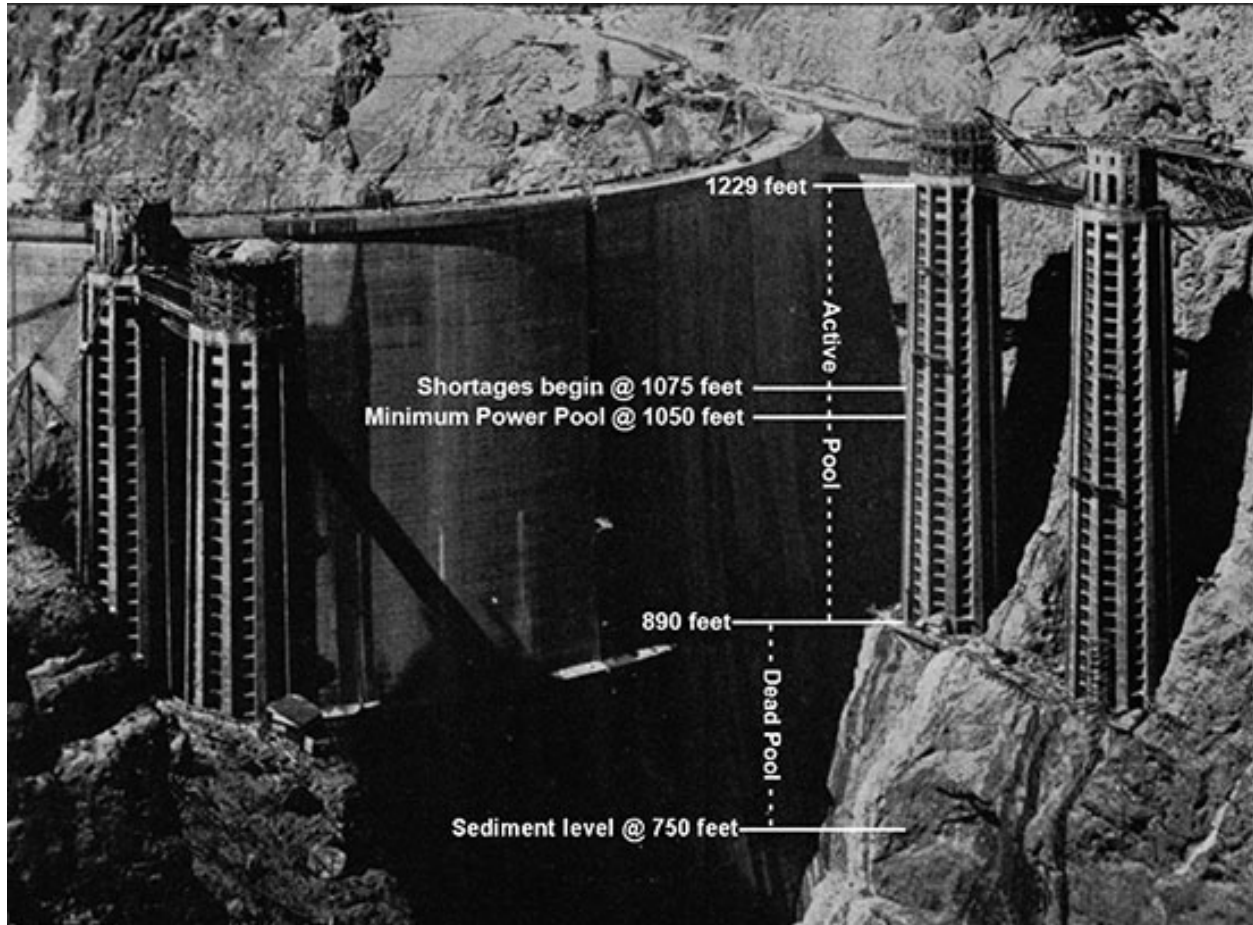
WELLS

- [MAP: Wells of Spanish Valley](#). GWSSA.
- [Wells of of Spanish Valley](#)

OTHER

- [Salaries of Grand County Employees](#)
-

Graphics



Hoover Dam: important elevations as of December 2007

The following are visual graphics to aid our understanding of managing the Colorado River Basin.

- [Aerial photo of Lake Mead @ Hoover Dam at low reservoir level in 2018.](#) Reclamation.
- [Aerial photo of Lake Mead @ Hoover Dam in 2015 when the reservoir elevation was about 1075 feet.](#) Reclamation.
- For photos, see our [gallery](#)
- [USGS photo library](#)
- [How Bad is it?](#) A look at the conditions of Lakes Mead and Powell as of January 1, 2019
- Reclamation's [Five-year Projection of Reservoir Conditions](#)

- Drought Contingency Planning: [Trigger elevations at Lake Mead and corresponding water shortage amounts](#)
- Congressional Research Service: Drought Contingency Planning (May, 2019)
 - [Figure 1: Areas That Import Colorado River Water](#)
 - [Figure 1.10: Tribal Water Rights and Diversions](#)
 - [Figure 2: Colorado River Basin Allocations](#)
 - [Figure 3: Lake Powell Mead Storage Inflows](#)
 - [Figure 4: Lower Basin States ICS balance 2010 to 2017](#)
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Transbasin Diversions

- [Transbasin Diversion Assessment 1994 to 2015](#)

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- [Supply & Demand Comparison of Colorado River Basin](#). 1923 to 2016.
- [Upper Basin consumptive use percentages](#)
- [Upper Basin percentages adjusted for 20% reduction in supply](#)

Leakage below Glen Canyon Dam

- [Tally: leakage/seepage; around/through; Glen Canyon Dam](#). John Weisheit, 2023.

Streamflow

- Reservoir capacity from 1980 to 2018 ([graph](#)); ([spreadsheet](#))
- [Decline of the 30-year Mean of Unregulated Flows into Lake Powell](#)

- [Unregulated FLOW Into Lake Powell](#) (2000 to 2016)
- [Annual yield summary of Colorado River](#)
- [Lake Powell Inflow and Glen Canyon Dam Outflow, 2000 to 2016](#)
- [Lake Powell Inflow 1964 to 2009](#)
- [Natural flow in various watersheds of the Colorado River Basin in MAF.](#)
- [Comparing "Critical Periods:" 1953 - 1964 & 2000 - 2013](#)
- [Natural flow @ strategic USGS gages](#)
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- [Instrument data \(1906-2008\) of natural flow @ Lee's Ferry](#)
- [Natural flow last 50 years](#)
- Tree-ring record by century & in million acre-feet from David Meko ([data](#)): [8th](#) (partial); [9th](#); [10th](#); [11th](#); [12th](#) ([MegaDrought](#)); [13th](#); [14th](#); [15th](#); [16th](#); [17th](#); [18th](#); [19th](#); [20th](#);

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- [Converting cfs to acre-feet by hour, day, week and month](#)
- [Estimated Year and Maximum Flow at Moab Paleoflood Research Site](#)
- [Flood peaks for 100-yr, 500-yr, 1000-yr & probable maximum in CFS](#)
- [Historic and Paleo Flood Peaks by Century](#)
- [Magnitude of paleofloods \(Paleoflood reserach & documents\)](#)
- [Photo of slackwater deposits with legend](#). Moab site.
- [Photo of slackwater deposits with legend of flow in cubic meters per second](#). Moab site.
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- [Lake Powell delta: river mobilization of sediment amounts 2002-2004](#)

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- [Colorado River Basin Evaporation](#). 1971 to 2007 averaged.

Glen Canyon Dam Operations

- [Annual Average Release From Glen Canyon Dam](#)
- [Grand Canyon beach erosion from Glen Canyon Dam operations](#)
- [Flow regime in Grand Canyon 1964-1965](#) (sediment scour event)
- [Leakage At Glen Canyon Dam](#)

Lake Powell Elevations

- [Glen Canyon Dam @ dead pool](#)
- [Glen Canyon Dam @ minimum power pool](#)
- [Lake Powell Reservoir Contents By Percentage](#)

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- [Historic flow at Hoover Dam Site 1906 to 2013](#)
- [Comparing Reclamation modeling for Lake Mead with actuals](#)

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- [Electricity use per capita, per state](#)

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- [Beetle stress on tamarisk along river corridor near Moab, Utah](#)
- [Rivers, dams, reservoirs & hydropower](#)
- [Free-flowing river miles between dams](#)
- [Evaporation Lakes Powell & Mead by second, minute, day and year.](#)

Photos

- [Photo below Glen Canyon Dam](#). Credit John Weisheit.
 - [Photo Hoover Dam & Lake Mead at elev. 1100](#). Credit John Weisheit.
 - [Photo Hoover Dam & Lake Mead at elev. 1073](#). Credit John Weisheit.
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ARIZONA DEPARTMENT OF WATER RESOURCES OR CAP

- [Shortage sharing in percent for lower basin](#)
 - [Arizona & Nevads shortage budget](#)
 - [CAP Delivery Priorities](#)
 - [Projected Lake Mead Elevation by 2019 at 8.23 Release](#). CAP.
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 - [Arizona's Annual Water Budget](#)
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Temperature and Precipitation

- [The most useful graphic from the Final EIS of 2007 Interim Guidelines](#). Lake Mead scenarios that challenge water delivery and hydropower operations; Colorado River System Simulation (CRSS); baseline data is the hydrologic record of the 20th century; three traces juxtaposed with the 10th, 50th and 90th percentiles, under No Action Alternative (business-as-usual) and to Year 2060. And here is the [Lake Powell graphic](#) which indicates scenarios of serious flood control challenges and hydropower curtailments.
- [CR basin temperatures 1895 - 2006](#)
- [UB Precipitation 1895 - 2006](#)
- [Temperature departures from 1895 - 2000 average](#)
- [Inflow of Lake Powell: breakdown by tributary](#)

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- [Thirteen-year inflow into Lake Powell](#)

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- [Minimum Required Colorado River System Storage Space](#)
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- [Notable Floods above Hoover Dam](#)
- [Contents of major dams \(including dead pool capacity\) above Hoover](#)

Green River and Yampa River

- [Yampa River Historic Flow from 1922 to 2020](#)
- [Flaming Gorge Reservoir Historic Unregulated Inflow from 1963 to 2020](#)

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- [GCD Monthly and Annual Release Volumes 1970 to 1981](#)
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- [Lake Powell operational tiers \(2007 ROD\)](#)
- [Lake Powell tier elevations in feet above sea level](#)
- [Lake Powell equalization tiers through 2026](#)
- [Lake Powell tiers in detail](#)
- [Important Elevations @ Glen Canyon Dam](#)
- [Schematic of penstock section @ Glen Canyon Dam](#)
- [Schematic of river outlets @ Glen Canyon Dam](#)
- [Schematic of spillway tunnel @ Glen Canyon Dam](#)
- [Schematic of the powerplant @ Glen Canyon Dam](#)
- [1982 - Range of powerplant efficiency with reservoir elevation](#)
- [1982 - Probabilities of Lake Powell Elevations \(to 2040\)](#)
- [1983 - Photo of "river left" spillway damage](#)
- [Photo of GC Dam penstock intakes](#)
- [Photo 01 of Penstocks & River Outlets before reservoir filling](#)
- [Photo 02 of Penstocks & River Outlets before reservoir filling](#)

Lake Mead or Hoover Dam

- [Tributary inflow Lake Mead \(below Glen Canyon Dam\)](#)
- [Hoover Dam important elevations](#)
- [Lake Mead surplus trigger elevations](#)
- [Lake Mead tier elevations in feet above sea level](#)
- [Longitudinal profile of sediment storage](#)
- [Shortage/surplus tiers @ Lake Mead](#)
- [Lake Mead elevation archive 1935-2010](#)
- [Water budget at Lake Mead](#)
- [Photo of Hoover Dam intakes](#)

Lakes Powell and Mead

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- [State of Storage 1999-2009](#)

- [Lake Mead & Powell operations: trigger elevations](#)
- [April 2010 - State of the system](#)

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- [Acre-foot description](#)
- [Hydrological assumptions of 1922 Compact](#). CRWCD.
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- [Pie Chart of seven state allocations](#)
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- [Colorado River Basin historical supply and use](#)
- [Apportions according to various flow scenarios](#)
- [Colorado River flow at Gulf of California](#)
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- [Supply & Demand Projection to 2060](#)
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- [Historic consumption by category](#)
- [Consumption for both basins and Mexico, 1906 to 2005](#) (no evaporation)

Lower Basin

- [Map: dams and diversions](#)

Project Inventory

- [Contents of major dams \(including dead pool capacity\) above Hoover](#)
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CALIFORNIA'S COLORADO RIVER BOARD

- [Monthly total Colorado River basin storage](#)

METROPOLITAN WATER DISTRICT of Southern California

- [MWD reservoir storage](#)
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- [Colorado State Total Depletions](#). CRWCD (2019).
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 - [Lake Powell inflow & release](#)
 - [Powell storage](#)
 - [Salinity chart](#)
 - [Lake Mead storage](#)
 - [Hoover flows](#)
 - [Estimated virgin flow at Lee's Ferry 1896 to 2004](#)
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 - [Map of trans-mountain diversions and amounts](#)
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 - [Upper Basin satellite image](#)
 - [Watershed boundaries in the arid lands](#). Powell Survey.
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 - [Map: dams and diversions lower basin](#)
 - [Map of transmountain diversions](#)
 - [Upper Green River](#) (12 dams)
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 - [Gunnison & Dolores rivers](#) (11 dams)
 - [San Juan River](#) (5 dams)
 - [Central Utah](#) (11 dams)
 - [Central Utah Project](#)
 - [Nevada, SW Utah and NW Arizona](#)
 - [Salt River Project Service Area](#)
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NATURAL RESOURCES CONSERVATION SERVICES

- [Snowpack GIS](#)
 - [Snowpack of western region](#)
 - [Snowpack of Colorado River Basin](#)
 - [FTP site](#)
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SOUTHERN NEVADA WATER AUTHORITY

- [Ten year average flow 2000 - 2009](#) ([Reclamation graphic](#))
 - [Fact sheet of basin](#)
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US GEOLOGICAL SURVEY

- [Colorado River basin fact sheet](#)
- [Lake Mead dead pool sediment thickness](#) ([cache](#))

- [Colorado River flow trend @ Lee's Ferry](#)
 - [Lake Powell stratification profile and temperature](#)
 - [Lake Powell dissolved oxygen concentrations](#)
 - [1997 to 2008 power generation@ Glen Canyon Dam](#)
 - [Water per capita use in the Intermountain West](#)
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- [List of dams in Colorado River Basin](#). Wikipedia.
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- [1500 - 2005 North American Drought Atlas](#). Cook et al.
- [Storage of Lakes Powell & Mead & combined](#)
- [Lake Mead storage](#)

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- [Lee's Ferry gage](#) (annual water yield)
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- [Upper Basin Present Perfected Rights](#). Kuhn, 2012.
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- [Percent runoff Upper Colorado sub-basins](#). Western Water Assessment.
- [Percent runoff Upper Colorado by elevation](#). WWA.

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Sediment

- [Cross section of sediment accumulation at San Juan Arm](#) (Lake Powell). Stevenson.

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- [Western Colorado uranium mill sites](#). Denver Post.
 - [Uranium production worldwide in 2009](#)
 - [Uranium claims in Grand Canyon watershed](#)
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Ground-Water and Geology



Spring-fed pool in the canyon country

John Wesley Powell said that geology "is the noblest of the sciences," because he understood its connection with every other discipline. Many of America's finest geologists made significant contributions after completing comprehensive studies on the Colorado Plateau; it is a very famous place.

Grove K. Gilbert, probably America's most respected geologist, noted that the study of most landscapes are very difficult, because they are covered by water, soil, plants, or even ice and snow. But not so for the Colorado Plateau! Probably no other landscape on earth has this much exposed bedrock.

Physical geology is what these men taught and it is a fascinating natural history which requires no special tools; just keen observation. For their story is about a landscape created and then destroyed; destroyed by the erosive power of a vigorous river. Who would ever think that such destruction could be so beautiful?

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- [2000 - Geology of Dead Horse Point](#). Doelling.
- [2003 - Geologic Hazards of Moab-Spanish Valley. Plate 01; Plate 02; Plate 03; Plate 04](#). UGS.

GROUNDWATER

Helpful Websites

- Please see the following [website](#) for Moab area ground water geologic information.
- [Managing aquifer recharge](#) in order to minimize ground water decline.
- [Website](#) with considerable information on ground water conditions in Utah.
- An on-line copy of the publication [Ground Water Conditions in Utah](#), Spring of 2009. This publication is re-published annually.
- [Graphs of ground water movement](#) over time in the Moab area. Maps showing the well locations are included.
- U.S. Geologic Survey in Utah: [specific well monitoring data](#).
- [Utah Geologic Survey groundwater monitoring](#).
- [Ground-water source protection user's guide](#). Utah Division of Water Quality

GROUND-WATER PUBLICATIONS

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- [2004 - Environmental Tracer Investigation Matheson Preserve Moab](#). Gardner.
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- [2004 - Hydrologic Evaluation Matheson Wetland Preserve](#). Solomon.
- [2004 - Hydrologic Investigation Scott Matheson Wetland Preserve Moab](#).
- [2004 - Summary Report](#). Gardner.

Ground-water Resources of Southeast Utah

- [USGS groundwater monitoring in Grand County](#)
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- [2026 - Hydrogeologic Study of Castle Valley Grand County Utah](#). Brinkman, UGS.

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- [Geologic Data](#)
- [Color Map](#)
- [Legend: Color Map](#)
- 2001 - [Drinking Water Source Protection Plan](#)
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- 2002 - [Drinking Water Source Protection Plan](#)
- 2008 - [Letter to Moab City](#) regarding development on aquifer recharge zones. EPA.

AGENCY WEB PAGES

- [Publications and maps from Utah Geologic Survey](#)
- [Utah Geologic Survey publication search engine](#)
- [Publications and maps from US Geological Survey](#)
- [Geology of Canyonlands National Park](#)

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 - Click [here](#) for more hydrology reports
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Health



The La Sal Mountains ([laccoliths](#))

[Central Utah Department of Health](#)

[Emergency Health Care Volunteers Network](#)

[Four Corners Community Behavioral Health](#)

[Moab Free Health Clinic](#)

[Southeastern Utah District Health Department](#)

[Utah Department of Health](#)

History: Human and Natural



Denis Julien 1836 inscription

THE RIVER BED CASE (USA v Utah). The case is an exceptional oral history of the Colorado River running community in Utah.

- [Click here](#) to read an article about the Colorado Riverbed Case.
- [The Decree and Utah State Objections](#)
- [Riverbed Case Brief USA 1929](#)
- [Riverbed Case Brief USA 1930](#)
- [Riverbed Case Brief Utah 1929](#)
- [Narrative Volume One with Table of Contents](#): Testimony of the river community
- [Narrative Volume Two with Table of Contents](#): Testimony of the river community.

HUMAN HISTORY

- [1937 - Inventory of Grand County documents](#)
- [1941 - Origin of Utah Place Names.](#)
- [Utah State History](#)
- [History of Canyonlands National Park and Region](#)
- [Chronology of Canyonlands Region](#)
- Moab Museum: [Oral history program](#)
- San Juan County: [Blue Mountain Shadows Magazine](#)
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- Utah State History: [Home page](#)

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The Stinky Desert Gazette & similar publications

- [Back issues](#). CPRG Website.

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- [History of Cache County](#). Peterson.
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- [History of Emery County](#). Geary.
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- [History of Millard County](#). Lyman & Newell.
- [History of Morgan County](#). Smith.
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- [History of Rich County](#). Parson.
- [History of Salt Lake County](#). Sillitoe.
- [History of SanpeteCounty](#). Antrei & Roberts.
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- [History of Toole County](#). Blanthorn.

- [History of Utah County](#). Holzapfel.
- [History of Wasatch County](#). Embry.
- [History of Wayne County](#). Murphy.
- [History of Weber County](#). Roberts & Sadler.

PLANTS

- [Southwestern Trees](#) by Elbert Little. 1950.
 - [Vascular plants of the Four Corners Regions](#)
-

Housing



Mesa Arch in Canyonlands National Park

Housing prices are increasing faster than wages, and current affordable housing is often located on land that developers want to build hotels, resorts and luxury homes. The Utah legislature mandates that communities adopt and plan for affordable housing. Utah communities also need a housing plan for transient workers that work in the service industry, and also to plan for the needs of the homeless, that includes victims of domestic violence.

This planning needs to occur before the soon-to-arrive mass retirement of the baby-boomer generation, which would likely stress the affordable housing needs of our communities.

WEB PAGES

Grand County & Moab City

- [Housing Information](#). Zacharia Levine.
- [Community Rebuilds](#)
- [Seekhaven](#)

- [Don't Mess With Moab](#)
- [Housing Authority](#)
- [Moab & Grand County Affordable Housing Plan](#)

San Juan County

- [Gentle Ironhawk Shelter](#)

State

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 - [2016 - Update: Grand County Housing Plan](#)
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- [The National Map Viewer](#). USGS
- [Web page to convert UTM \(Universal Transverse Mercator\) coordinates to geodetic positions](#)
- [Utah's GIS Portal](#) for topos and much more
- [Utah ARC Maps](#) for diverse mapping projects
- **ACME MAPPER (powered by Google)**
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- **BUREAU OF LAND MANAGEMENT (BLM)**
- [1999 - Maps of Utah BLM Wilderness Inventory \(cache\)](#). GPO.
- [Oil & Gas parcels adjacent to Moab Area Sole-Source Aquifer](#)
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- [Interactive map of Canyonlands NP](#)

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- [Hatch Point Proposed Land Exchange](#)
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Mining and Milling



White Mesa Uranium Mill near Blanding, Utah

Online documents file of Utah Division of Oil, Gas and Mining (UDOGM)

- [UDOGM permit files \(complete\)](#)
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- [Home page](#) (Username and password is ogmguest)
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Moab in 1914 at Center and Main

[Moab City home page](#)

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- [2011 - Moab Water Conservation Plan Update](#)
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- [2016 - Moab City Water Conservation Plan Final](#)
- [2017 - Moab City General Plan Update](#) (Draft)
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- 2008 - [Letter to Moab City](#) regarding development on aquifer recharge zones. EPA.
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- [2016 - Final Environmental Study: Moab City Wastewater](#)

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- [Click here](#) to view Grand County Water Documents
- [Guidelines To Petition: Reclassify Aquifer](#)
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- [Homepage](#)
- [MIC Water Rights Itemized](#)

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Monticello



The Abajo or Blue Mountains

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The following tables have hyperlinks to articles from Moab's local newspaper called *The Times-Independent*, which are archived at [Utah Digital Newspapers](#).

- [List of articles using search engine for the word "Creek"](#)
- [List of articles using search engine for the word "Flood"](#)
- [List of articles using search engine for the phrase "Moab Irrigation Company"](#)
- [List of articles using search engine for the word "Rain"](#)
- [List of articles using search engine for the word "Water"](#)

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The Stinky Desert Gazette: [Back issues](#)

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2/4/10 - [Climate Skeptics Call On BYU Scientists To Apologize](#)

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[Click here](#) for a pdf with working links to the Grand Junction Sentinel

[Click here](#) for a pdf of the complete series

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**Sand dunes at
White Wash**

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[Canyonlands Film Society](#)

[Colorado Plateau River Guides](#)

[Community Rebuilds](#)

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[Utah Open Lands](#)

[Utah Watershed Coordinating Council](#)

[Wabi Sabi Thrift Store](#)

[Youth Garden Project](#)

NPS



**Delicate Arch in
Arches National
Park**

THE NATIONAL PARK SERVICE

The national parks of southeast Utah include [Arches](#) and [Canyonlands](#). An extension of Canyonlands, called [Horsehoe Canyon Unit](#), is in Wayne County. The national monuments include [Natural Bridges](#) and [Hovenweep](#). These federal reserve lands are managed by the Southeast Utah Group with headquarters in Moab, Utah.

[Glen Canyon National Recreation Area](#) (Lake Powell) is also in southeast Utah and northern Arizona. It includes both sides of the Colorado and a bit of the Green River in Wayne County. Inside the recreation area is the one square-mile of [Rainbow Bridge National Monument](#). These two park units are managed from headquarters in northern Arizona at the city of Page.

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- [2009 Report](#). NPS.
- [Ozone exceedances in Canyonlands NP](#)
- [NPS ozone exceedance web page](#)

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- [Senate Report on expansion of Arches NP in 1998](#)
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- [History of Canyonlands National Park and Region](#)
- [2008 - Administrative History of Canyonlands NP](#). Schmeiding.
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- [Canyonlands Geology](#)
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- [1987 - Glen Canyon Water Resources Management Plan](#)

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- [Canyonlands Soil Survey](#)
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Oil & Gas & Coal



Abandoned wells are not reclaimed in Utah

For information on oil & gas leasing on federal lands, [visit the BLM section](#)

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- [2012 Report to County Council](#).
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- [Home page](#)

- [Well information search](#)
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- [Website of Danish Flats Environmental Services, Inc.](#)
- [Danish Flats satellite image](#)
- [2010 - Draft NOI for Emissions Analysis](#)
- [Site Processing and Equipment](#)
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- [GRAMA: eMail correspondance](#)
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- [Satellite image of Harley Dome and Bitter Creek](#)
- [USGS topo with potential monitoring wells located](#)
- [Abandoned wells in 1/2 mile radius](#)
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- [Map of affected area](#)
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- [2010 - MAP: Harley Dome and Westwater Area](#)
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- [Pre-treatment schematic](#)
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- [Ordinance Report Part 01](#)
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- [January 27, 2011 - PC recommends county approve Westwater Farms](#)

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- [NGO Comments on Air Quality from Oil and Gas Development in Dixie Nat. Forest](#)
- [Endocrine Disruption Exchange](#)

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- 11/12/09 - Times-Independent: [County enacts production water moratorium](#).
- 10/01/09 - Reuters: [Water worries threaten US push for natural gas](#)
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- 8/09/09 - Associated Press: [Colorado landowners wary of effort to resume drilling](#).
- 11/17/08 - Denver Post: [Drilling process causes water supply alarm](#).
- 10/21/10 - Salt Lake Tribune. [Ozone raises its ugly head in rural Utah](#).
- 10/25/10 - ENN. [Fracking shown to mobilize Uranium in Marcellus Shale](#).

MAPS

- [Existing and proposed oil and gas parcels](#)
 - [BLM and SITLA oil and gas leases](#)
-

Oil (Tar) Sands

UPDATE as of September 2023

- All federal leasing for oil shale development in Utah and Colorado have expired or have been relinquished.
- Activities for tar sand development in Utah have ceased.

Oil shale and tar sands remains a speculative industry in the arid lands of the Colorado Plateau. A general lack of water is why the industry will never be viable. Even if alternative chemical washes are used to separate bitumen from sand, for example, it still requires 1.5 to 2 barrels of water to refine a single barrel of synthetic crude. What this extraction will accomplish is physical damage to the Colorado River watershed, which supplies culinary water to nearly 30 million people. It will also create more CO₂ in the atmosphere, which is the #1 killer of the Rocky Mountain snowpack, which provides 85% of the Colorado River's total annual water supply. Our watershed needs investors to create a reliable energy supply that will heal the water supply of the Colorado River, not destroy it.



Tar Sands Grand County

LATEST UPDATES

September, 2017 - US Oil Sands declares receivership in Canada and bankruptcy in USA

- [Canadian receivership document](#) (insolvency)
- USA document [01](#) & [02](#)
- [ACMO S.a.R.L. receives PR Spring Mine](#) & [Press Release from US Oil Sands](#).
- [USO \(Utah\) LLC receives approval to transfer mining application from US Oil Sands](#)
- [News about Petroteq](#) (formally MCW) at Asphalt Ridge (Vernal, UT). Bloomberg News.

Independent Technical Memorandum: Greenhouse Gas & Water Footprints of Oil Shale & Tar Sands Resources & Projects in the Upper Colorado River Basin. 2018, EcoShift. The Executive Summary of this report is [HERE](#).

December, 2016 - [Activities report and water quality testing results](#)

November, 2016 - US Oil Sands must apply for a federal contract to appropriate water. [Order of the State Engineer](#); US Oil Sands water right records: [49-2274](#)

November, 2016 - **US Oil Sands 3rd Quarter Report:** USOS does not have sufficient capital.

CLICK HERE to read this color booklet created by Living Rivers and the Colorado Riverkeeper

CLICK HERE to read this investor analysis of US Oil Sands. Seeking Alpha.

CLICK HERE to read information about the Programmatic EIS for oil shale and tar sands in Wyoming, Colorado and Utah

CLICK HERE to watch the first documentary about Utah unconventional fuel called **Last Rush for the Wild West: Tar Sands. Oil Shale and the American Frontier.**

[Read this article about strip mining tar sands in Grand County](#)

To **SUBMIT A LETTER** of concern to Utah Division of Oil, Gas and Mining [click here](#)

[Article with talking points](#)

INVENTORY OF TAR SAND DEPOSITS IN UTAH

State Land ([SITLA](#))

- 141,020 State Trust acres on which tar sands are known or expected.
- 52,887 State Trust acres under lease for tar sands
- A typical lease lasts 10-years
- Only a very small part of the above acres could be surface mined
- [US Oil Sands Lease with SITLA](#)
- [US Oil Sands Contract Report](#). SITLA.

Federal Lands ([BLM](#))

- NOTE: there are no tar sands in Colorado or Wyoming.
- 2008 - Total identified is 430,686 acres
- 2012 - The proposed preferred alternative identifies 91,045 acres
- **RECORD OF DECISION** (Issued March 22, 2013)

Land Exchanges

- [2013 - Utah Recreational Land Exchange](#)

AMERICAN SANDS ENERGY (West Tavaputs Plateau near Mt. Bruin)

- [2014 - Notice of Intent to Commence Large Mining Operations](#)
- [2014 - First Review of NOI by UDOGM](#)
- [2015 - Revised Notice of Intent](#)

ADMINISTRATIVE RECORD OF UTAH DIVISION OF OIL, GAS & MINING (UDOGM)

- [UDOGM permit files \(complete list\)](#)
- **Username and password is: ogmquest**
- [US Oil Sands @ PR Springs for large & small mining permits](#)
- [UDOGM Board Notes and Dockets](#)

ADMINISTRATIVE RECORD OF PROPOSED STRIP MINING @ PR SPRINGS US Oil Sands (Utah) Inc., (formally Earth Energy Resources)

- [2014 - Amended Operation Plan \(file reduced\); \(high rez maps\); \(text searchable\); \(appendix text searchable\)](#).
- [Docket of PR Springs litigation](#)
- [UDOGM docket for PR Springs litigation](#)
- [DWQ docket for PR Springs litigation](#)
- [2007 - EER Mining Plan PR Springs in Grand and Uintah County](#)
- [2009 - EER Mining Plan PR Springs in Grand and Uintah County](#)
- [2009 - Presentation by Earth Energy Resources](#)
- [2010 - EA for public comment on water well for PR Springs](#). BLM
- **Public Notice:** EER proposal for large scale mining of tar sands at PR Springs. Comments are due: 30 days after March 23, 2010.
- [Grand County Council Comments](#)
- [2010 - Initial Comments by Non-Profit Groups](#)
- [2011 - Notice of Intent for exploratory drilling of bitumen deposits at PR Springs by Oil Sands USA](#)
- **Math** - The PR Springs project will provide the nation with 6 hours of oil consumption.
- [Analysis Spreadsheet](#) (xls)
- **Ophus Process** - What we know about the citrus based processing chemical. MSDA reports.
- [Patent Application](#); [Lemon Terpenes](#); [Akzo Surfactant 01](#); [Akzo Surfactant 02](#);

ADMINISTRATIVE RECORD OF UTAH DIVISION OF WATER RIGHTS @ PR SPRINGS (State Engineer)

Water Right for US Oil Sands 49-2274 (a33805)

- [Potential Impacts to Perennial Springs from Tar Sand Mining in the Tavaputs Plateau, Utah](#). Johnson et al.
- [Hydrochemical Data from Perennial Springs in the PR Spring Area of Southern Uinta Basin](#). Johnson et al.
- [Scanned documents for 49-2274](#)
- [Map of water rights, leases and properties of US Oil Sand & DeLambert Ranch](#)
- [Drill logs for 5 water production wells](#)
- [Administrative record @ Utah Division of the State Engineer](#)
- [Water right 41-3523 \(Uintah County Water Conservancy District\)](#)
- [Request For Extension Of Time To File Proof Of Beneficial Use](#)
- [Hearing of the Protest for Extension to File Proof](#) (audio file)
- [Photos](#) of destructive road and well pad activities

Other water rights (adjacent to proposed mine @ 4.5 gallons per minute)

- [Water right 49-1567](#)
- [Water Right 49-122](#)
- [\(Docs\)](#)

Additional water well information (state and federal)

- [Willow Watershed 1406006](#) (Lower Green/Desolation Canyon).EPA.
- [Willow Watershed Water Resources Links](#). USGS.
- [EPA groundwater summary of Uinta Basin](#)
- [Map: Water well and pipeline](#)
- [Map: Topo of PR Springs](#)
- [Proposed water well](#). Division of Water Rights.
- [2010 - Comments on BLM's EA for water well at PR Springs](#). Living Rivers.
- [Map of well site](#)
- [Satellite image of well pad for PR Springs mine](#)
- [FOIA - BLM Water Right-of-Way @ PR Springs mine](#)

ADMINISTRATIVE RECORD UTAH DIVISION OF WATER QUALITY (DWQ) for PR SPRINGS

- [Consolidated Initial Record as of January 2012](#)
- [DWQ website archive](#)
- [March 2011 - Appeal to Utah Division of Environmental Quality](#)
- [November 2011 - Order on motion to dismiss denied](#)
- [May 2012 - Transcript of Hearing Vol. 1 & Vol. 2](#).

TRANSCRIPTS OF HEARINGS FOR PR SPRINGS STRIP MINING OPERATION

- [Informal hearing transcription of 7/27/10](#)

- [Compilation of reference materials](#)
- 2011- Prepared testimony from expert witnesses: [Elliott Lips & Charles Norris 01](#) & [Charles Norris 02](#)
- [2011 - Transcript of Formal UDOGM Hearing of Feb. 2011.](#)
- [2012 - Transcript of expert witness William Johnson](#)
- [May 2012 - Transcript of DWQ Hearing Vol. 1](#) & [Vol. 2.](#)

ADMINISTRATIVE RECORD OF ENVIRONMENTAL PROTECTION ADMINISTRATION (EPA)

Air Quality at Proposed PR Springs Mine

- [Part One](#); [Part Two](#); [Part Three](#); [Part Four](#); [Part Five](#);
- [Air Resources and Chemical Processing](#)
- [NSPS Subpart Ja](#)
- [2010 - Fact sheet on ozone standards](#)

ASPHALT RIDGE MINING OPERATIONS (near Vernal, Utah)

- [Map - Asphalt Ridge Projects.](#)
- [Brief History of Asphalt Ridge Development.](#)

Crown Asphalt Ridge (CAR) Korea Technology Industry of America (Defunct)

-
- Website - [JAM Industrial, Inc.](#) (Tar sands demonstration project that ended in bankruptcy).
- [2004 - Study Demonstration Process Bitumen Utah Tar Sand.](#) Society of Petroleum Engineers.
- [CAR Google Earth](#)
-
- **CAR - Department of Water Quality (DWQ)**
- [CAR - Public Notice Public Notice](#)
- [CAR - Application Letter.](#) 2012.
- [CAR - Application.](#) 2012.
- [CAR - Application Appendix A Lab Report.](#) 2012.
- [CAR - Application Appendix B Well Logs.](#) 2012.
- [CAR - Application Attachments.](#) 2012.
- [CAR - Statement Of Basis.](#) 2012.
- [Comments - Western Resource Advocates and Living Rivers.](#) 2012.
- [Response - To WRA and LR.](#) 2012.

MCW Energy Group @ Asphalt Ridge

- [MCW Energy - GoogleEarth.](#)
- [MCW Energy - Public Notice.](#)
- [MCW Energy - DWQ Application.](#)
- [MCW Energy - Construction Permit.](#)
- [MCW Energy - Statement of Basis.](#)

AIR QUALITY

[2013 - Air Quality in the Industrial Heartland of Alberta Canada and Potential Impacts to Human Health.](#) Simpson et al.

ARCHEOLOGY

- [2002- Perspectives Revisited: Overview of Cultural Resources Uinta Basin & Tavaputs Plateau.](#) Spangler.

BUREAU OF LAND MANAGEMENT

- 1983 - Uinta Basin Synfuels Development, Final Environmental Impact Statement. www.riversimulator.org/Pubs/OSTS/Ref/BLMsynfuelsFEIS1983.pdf
- 1983 - Utah Combined Hydrocarbon, Regional Draft Environmental Impact Statement. www.riversimulator.org/Pubs/OSTS/Ref/BLMregionalDEIS1983a.pdf
- 1984 - Utah Combined Hydrocarbon, Regional Final Environmental Impact Statement. www.riversimulator.org/Pubs/OSTS/Ref/BLMregionalFEIS1984.pdf
- 1984 - Book Cliffs Resource Management Plan, Final Environmental Impact Statement. www.riversimulator.org/Pubs/OSTS/Ref/BLMveranalRMP1984.pdf
- 1984 - Air quality assessment for the Environmental Impact Statement on the Federal Oil Shale Management Program. www.riversimulator.org/Pubs/OSTS/Ref/BLMAirQualityOSTS1984.pdf
- 1985 - PR Spring Combined Hydrocarbon Lease Conversion Draft Environmental Impact Statement. www.riversimulator.org/Pubs/OSTS/Ref/BLMprSpringsDEIS1985.pdf
- 1985 - PR Spring Hydrocarbon Lease Conversion Final Environmental Impact Statement. www.riversimulator.org/Pubs/OSTS/Ref/BLMprSpringsFEIS1985.pdf
- 1990 - Winter Ridge Wilderness Study Area. www.riversimulator.org/Pubs/OSTS/Ref/BLMwinterRidgeWSA1990.pdf
- 1999 - Utah Wilderness Inventory. www.riversimulator.org/Pubs/OSTS/Ref/BLMwilderness1999.pdf
- 2013 - Oil Shale & Tar Sands, Programmatic Environmental Impact Statement: Official web site. ostseis.anl.gov/documents/index.cfm
- **RECORD OF DECISION** (Issued March 22, 2013)

Paving Seep Ridge Road in Uintah County

- [Environmental Assessment](#)

2008 Oil Shale & Tar Sands Programmatic EIS

- [Home Page](#)
- [Federal Notice](#)
- [Environmental Impact Statement](#)
- [Record of Decision](#)
- [Additional Information](#)
- Tar Sands: [Basic Information](#)
- Oil Shale: [Basic Information](#)
- [Endangered Species List](#)
- [Comments of California Attorney General](#)

CORPORATE WEBSITES

- **NEW:** [Company Profiles](#)
- [Nevtah Capital Management](#)
- [US Oil Sands formerly Earth Energy Resources](#)
- [2007 - EER Mining Plan PR Springs in Grand and Uintah County](#)
- [2009 - EER Mining Plan PR Springs in Grand and Uintah County](#)
- [2013 - US Oil Sands Corporate Presentation](#)
- [2009 - Presentation by Earth Energy Resources](#)
- Korea Technology Industry of America (Defunct)
- [Presentation: Mining in Uintah County](#)
- [Temple Mountain Energy](#)
- Wentworth Energy (Asphalt Ridge tar sands)
- [American Sands Energy Corp](#)

DOCUMENTS

- 2007 - [Analysis of Utah Tar Sands](#). Baxter.
- 2008 - [History of Tar Sands in North America](#). Congressional Research Service.
- 2010 - [Energy-Water Nexus: Better Understanding of Water Resources](#). GAO.
- 2010 - [Policy Analysis of Water Availability and use Issues for Domestic Oil Shale and Oil Sands Development](#). Univ. of Utah.
- 2010 - [American Tar Sands](#). Williams.
- 2010 - [Water Availability for Tar Sands and Oil Shale](#). Keiter.
- 2012 - [Energy Water Nexus for Utah](#)
- [Oil Shale Politics in Utah: Holding Government Officials, Lobbyists, and Corporate Management Accountable to the Public](#)

ECONOMIC VIABILITY

- [2014 - Updated: Energy Initiatives & Imperatives for Utah's 10-Year Strategic Energy Plan 2.0](#). Governor Herbert.
- [2014 - Drilling Deeper: A Reality Check on US Government Forecasts for a Lasting Tight Oil & Shale Gas Boom](#). Hughes.
- [2013 - Executive Summary: Tar Sands Oil Shale Market Assessment](#). U of U.
- [2013 - Oil Shale Market Assessment](#). U of U.
- [2012 - Investor Oil Shale Risks](#). CERES.
- [2011 - Economic Impact of Marcellus Shale Gas](#). Cornell.
- [2011 - Marcellus Shale: What Are The Limitations?](#) Cornell.
- [2010 - Oil Shale: 14 Unanswered Questions](#). Headwater Economics.
- [2008 - North American Oil Sands History Development Prospects](#). Congressional Research Service.
- [2008 - Developments In Oil Shale](#). Congressional Research Service.
- [2007 - Testimonies Oil Shale](#). RAND.
- [2006 - Oil Shale History Incentives Policy](#). Congressional Research Service
- [2005 - Oil Shale Development USA](#). RAND.

ENDANGERED AND THREATENED SPECIES

- [Critical Habitat Designation](#). USFWS.
- [Mexican-spotted owl](#)
- [Greater sage grouse](#)
- Graham's Penstemon ([Photo](#)) ([Recent news](#)) ([Aid to identify](#))
- [Screen of endangered species at Red Leaf Resources](#)
- [Map 01 & Map 02: endangered species @ Red Leaf Resources](#)
- [Sage grouse brood habitat at PR Springs](#)
- [Critical Habitat Map](#). The Wilderness Society.

GEOLOGY

[Oil Shale and Tar Sands web page](#). Utah Geologic Survey.

[Tar Sands Bibliography](#) (2009). UGS.

[USGS publications library](#)

- [2013 - Hydrochemical Data from Perennial Springs in the PR Spring Area](#). Johnson.
- [2008 - Oil shale and tar sands Programmatic EIS](#). BLM.
- [2008 - Holocene Debris Flows on the Colorado Plateau](#). Webb.
- [1996 - Tar Sands Resources Uinta Basin](#). Blackett.
- [1992 - Hydrocarbons along proposed Book Cliffs Highway](#). UGS.
- [1984 - Characteristics of PR Springs Tar Sands](#). Dana.
- [1984 - Economic Potential of PR Springs Tar Sands](#). UGS.
- [1980 - PR Springs Tar Sands](#). UGS; Dahm.
- [1980 - Characteristics of PR Springs Tar Sand Deposits](#). DOE.

- [1980 - Characterization of Utah Bitumen](#). BoM.
- [1980 - Properties of Utah Tar Sands](#). BoM.
- [1979 - Geology Oil Impregnated Sandstone Utah](#). UGS; Campbell.
- [1975 - Mineral Resources of Uintah Ouray Reservation](#). USGS.
- [1971 - Grand County Tar Sands](#). UGS; Gwynn.
- [1970 - PR Springs Tar Sands](#). UGS; Byrd.
- [1966 - PR Springs Tar Sands](#). Open File Report; UGS.
- [1966 - PR Springs stratigraphic column of tar sand deposits](#)
- [1964 - Bituminous Sandstone Uinta Basin](#). Covington.

Geologic Bibliography

- [Uinta Basin Geology](#)

GROUND WATER

- 2015 - [Potential Impacts to Perennial Springs from Tar Sand Mining in the Tavaputs Plateau, Utah](#). Johnson et al.
- 2013 - [Hydrochemical Data from Perennial Springs in the PR Spring Area](#). Johnson.
- [1983 - Potential Impacts on Hydrology from Tar Sands Industry](#). USGS.
- [1975 - Hydrologic Reconnaissance of Southern Uinta Basin, Utah and Colorado](#). Price & Miller.

LEGAL DOCUMENTS

- [2009 - Letter from Western Resource Advocates](#).
- [Petitioners withdraw with prejudice](#)
- PR Springs Settlement. SUWA, Sierra Club, Western Resource Advocates.
- [Comments on Air Quality from Oil and Gas Development in Dixie Nat. Forest](#)
- [2010 - Montana Environmental Information Center v BLM](#)
- [2010 - Mexican spotted owl critical habitat decision](#)
- [2010 - History of Mexican spotted owl appeal](#)

MAPS & GIS

- BLM PEIS: [Tri-state deposits](#)
- [Uinta Basin](#)

Google Earth

- [Tar sand deposits 01](#). Data from BLM PEIS.
- [Tar sand deposits 02](#). Data from BLM PEIS.
- [Satellite image of well pad for PR Springs mine](#)

PR Springs

- [Map of 1966](#)
- [Tar sand saturation map of 1966](#)
- [1966 - PR Springs stratigraphic column of tar sand deposits](#)
- [Stratigraphic column Section 27](#) (Monument Ridge Road Junction)
- [Location of spings](#)
- [Map: Topo of PR Springs](#)
- [Map: Proposed mining operations @ PR Springs](#)
- [Location of tar sand deposits in Uinta Basin](#)

Green River Refinery (proposed) ([click here](#))

SITLA

- [Oil shale resource ownership](#)
- [Parcels in Grand County](#) (14.9%; about 550 sq. miles)
- [US Oil Sands Lease with SITLA](#)
- [US Oil Sands Contract Report](#). SITLA.

University of Utah

- [Interactive Map](#)

Other

- [Critical Habitat Map](#). The Wilderness Society.
- [Map - Where tar sand oil is refined](#)
- [Map: PR Springs water well and pipeline](#)
- [Map: Topo of PR Springs](#)
- [Map: Proposed mining operations @ PR Springs](#)

NEWS

- [6/15/10 - Wildflower vs. Oil Shale](#). Salt Lake Weekly.
- [11/30/10 - GAO: More research needed on oil shale, water](#)
- [9/17/2007 - Tar sands, oil shale](#). Energy Bulletin.
- [3/17/2010 - First US Tar Sands to Break Ground in Utah](#).

- [3/18/10 - Tar sand industry comes to eastern Utah.](#)
- [3/24/10 - Decision on wildflower protection expected soon.](#) Assoc. Press.
- [3/28/10 - Company seeks first U.S. oil sands project in Utah.](#) SL Tribune.
- [3/29/10 - Sage Grouse will play role in Western energy development.](#) Marten Law.
- [4/29/10 - Salazar aide - Oil shale not ready for prime time](#)

NON-PROFIT ORGANIZATIONS

- [Document archive.](#) Western Resource Advocates.
- [Fossil Foolishness.](#) Western Resource Advocates
- [Northern Rockies Rising Tide](#)
- [CERES Report on Oil Shale/Water Nexus.](#)
- [Tar Sands: Feeling the climate crisis.](#) FOE Europe.
- [Dirty Oil.](#) Greenpeace.
- [2011 - Between a Rock and a Dry Place: The Impact of Oil Shale Development and Climate Change on the Colorado River Basin Water Supply.](#) NRDC

PHOTOS

- [Baseline Map: Drill Test Sites PR Springs](#)
- [Book Cliffs Divide Road Grand County; Reduced](#)
- [Camp One; Reduced](#)
- [Camp Two; Reduced](#)
- [Drill Pads; Reduced](#)
- [East Canyon Grand County Approach; Reduced](#)
- [Equipment Yard; Reduced](#)
- [Landscapes; Reduced](#)
- [Neighboring Gas Well; Reduced](#)
- [Pit; Reduced](#)
- [Processing Site; Reduced](#)
- [Products; Reduced](#)
- [PRsprings; Reduced](#)
- [Water Well Site One; Reduced](#)
- [Earth Energy Resources @ PR Springs, June 2010](#)
- [Earth Energy Resources test pit: #1; #2; #3; #4;](#)
- [BLM PEIS photos](#)

Aerial Photos

- [Aerial photos of East Tavaputs Plateau.](#) Large file. Includes operations by US Oil Sands and Red Leaf Resources; areas of chained trees; wilderness and roadless areas.
- [Tar sand mining boundary of PR Spring 01](#) (blue line is Grand & Uintah border)
- [Tar sand mining boundary of PR Spring 02](#)

Satellite Images

- [Satellite image of well pad for PR Springs mine](#)

TRADE ASSOCIATIONS

- [White Paper](#). Utah Mining Association.

UNIVERSITY

- [2007 - Utah Tar Sands: Worth the Energy?](#)
- [2009 - Oil Shale Report](#). University of Colorado at Boulder.
- [University of Utah ICSE Digital Repository](#)
- [2009 - Western US Tar Sands Conference](#)

USGS

- [Oil shale and tar sands interactive web page](#) (excellent resource)
- [1995 - Surface disturbances and the role of accelerating erosion](#). Belnap.
- Graphic: [tar sand deposits in the USA](#).

UTAH GOVERNMENT

- [Home page](#): Utah Oil, Gas & Mining
- [Public records](#): Utah Oil, Gas & Mining. (Username and password is ogmquest)
- [FTP Site](#). Utah Oil Gas & Mining
- [PR Springs water right 01 and 02](#). Utah Division of Water Rights.
- [1980 - An Assessment of Oil Shale and Tar Sands Development](#)
- [2009 - Bibliography of tar sand deposits & map](#). Utah Geological Survey.
- [2009 - Approval of PR Springs strip mine for tar sand](#). UDOGM.
- [2010 - Notice regarding PR Springs Mine to Grand County Council](#). UDOGM.
- [2012 - Energy Water Nexus for Utah](#)

VIDEO

- [Fossil Foolishness](#). Western Resource Advocates.
- [A film by Leslie Iwerks](#)
- [The Tar Sands Blow](#)
- [Tar Sands](#), Canadian Broadcasting Corporation
- [Red Leaf Resources](#). EcoFLight.

WILDLIFE

Southeast Utah (includes East Tavaputs Plateau)

Oil Shale (Kerogen)

UPDATE as of September 2023

- All federal leasing for oil shale development in Utah and Colorado have expired or have been relinquished.
- Activities for tar sand development in Utah have ceased.

Oil shale and tar sands remains a speculative industry in the arid lands of the Colorado Plateau. A general lack of water is why the industry will never be viable. Even if alternative chemical washes are used to separate bitumen from sand, for example, it still requires 1.5 to 2 barrels of water to refine a single barrel of synthetic crude. What this extraction will accomplish is physical damage to the Colorado River watershed, which supplies culinary water to nearly 30 million people. It will also create more CO₂ in the atmosphere, which is the #1 killer of the Rocky Mountain snowpack, which provides 85% of the Colorado River's total annual water supply. Our watershed needs investors to create a reliable energy supply that will heal the water supply of the Colorado River, not destroy it.

HOW TO GET INVOLVED

Click here to send a message to the **Department of Water Quality** about proposed strip mining operations by **Red Leaf Resources** in the Uinta Basin.

NEW INFORMATION

Independent Technical Memorandum: Greenhouse Gas & Water Footprints of Oil Shale & Tar Sands Resources & Projects in the Upper Colorado River Basin. 2018, EcoShift. The Executive Summary of this report is [HERE](#).

New Information Regarding Red Leaf Resources Mining Permit

- [Experimental Capsule Description](#) (Earth Ovens)
- [Water Discharge Permit](#)

STATE LAND INVENTORY FOR OIL SHALE IN UTAH

- 93,000 State Trust acres are leased for oil shale
- A typical lease lasts 10-years
- Not all land can be surface mined (some requires underground mining)

ADMINISTRATIVE RECORD: Red Leaf Resources

- [Living Rivers v Red Leaf Resources](#)
- [Final Memo in Opposition Motion in Limine](#)
- [Final MSJ Response](#)

- [Final Response to DOGM's Pre-Hearing Brief](#)
- [Final Response to DOGM's Reply](#)
- [DOGM Pre-Hearing Brief](#)
- [RED LEAF'S PRE-HEARING BRIEF](#)
- [RLR PRE-HEARING REPLY BRIEF](#)
- [RLR'S MEMO IN SUPPORT OF MOTION FOR PARTIAL SUMMARY DECISION](#)
- [RLR'S MEMO IN SUPPORT OF MOTION IN LIMINE](#)
- [RLR'S MOTION FOR PARTIAL SUMMARY DECISION](#)
- [RLR'S MOTION IN LIMINE](#)
- [DEQ comments Red Leaf 2012 Feb](#)
- [DOGM Red Leaf Hearing Notice Feb 2012](#)
- [DWR comments Red Leaf 2012 Feb](#)
- [LivingRivers RAA Red Leaf](#)
- [Red Leaf Informal Hearing Transcript 2012 March](#)
- [Red Leaf NOI protest](#)
- [Weisheit Declaration](#)

ADMINISTRATIVE RECORD: Discharge permit Red Leaf Resources

- [Draft Permit](#)
- [Draft Statement of Basis](#)
- [Ground Water Discharge Permit Application June 2013](#)
- [SOB Figure 1 Site Location Map](#)
- [SOB Figure 2 EPS Site Plan](#)
- [SOB Figure 3 Generalized Strat Column Green River Formation](#)
- [SOB Figure 4 EPS Capsule Roof Floor and Wall Details](#)
- [Supplemental Seep and Spring Inventory May 2013](#) (large file)

Utah Division of Oil, Gas and Mining (UDOGM)

- [UDOGM permit files \(complete\)](#) (Username and Password: ogmguest)
- [UDOGM Board Notes and Dockets](#)

Red Leaf Resources Inc. (oil shale mining permits)

- [UDOGM permit files \(complete\)](#) (Username and Password: ogmguest)
- Red Leaf Resources @ Southwest #1
- Red Leaf Resources @ Southwest #1b
- Red Leaf Resources @ Site #1
- Red Leaf Resources @ Site #3
- Red Leaf Resources @ Site #4
- Red Leaf Resources @ Site #6
- Red Leaf Resources @ Site #7
- Red Leaf Resources @ Site #8
- Red Leaf Resources @ Site #9

OIL SHALE STRIP MINING @ INDIAN RIDGE

[Notice of Intent \(NOI\) to Commence Large Mining Operations](#). Red Leaf Resources.

[November 2011 - Red Leaf NOI Protest](#). Living Rivers and Western Resource Advocates.

[February 2012 - Notice of informal hearing for Red Leaf Resources](#).

[February 2012 transcript of Red Leaf hearing](#).

[March 2012 - Living Rivers request for agency action](#)

To **SUBMIT A LETTER** of concern to Utah Division of Oil, Gas and Mining [click here](#)

BUREAU OF LAND MANAGEMENT

[BLM EA on paving of Seep Ridge Road in Uintah County](#)

Oil Shale & Tar Sands Programmatic EIS

- [Home Page](#)
- [Federal Notice](#)
- [Environmental Impact Statement](#)
- [Record of Decision](#)
- [Additional Information](#)
- Tar Sands: [Basic Information](#)
- Oil Shale: [Basic Information](#)
- [Endangered Species List](#)
- [Comments of California Attorney General](#)

CORPORATE WEBSITES

- **NEW:** [Company Profiles](#)
- [National Oil Shale Association](#)
- [AuraSource](#) (China)
- [Nevtah](#)
- [Earth Energy Resources](#)
- [Enshale](#) & [Bullion Monarch Mining](#)
- [Enefit](#)
- [Oil Shale Exploration Company](#) (Now [Enefit](#))
- [Red Leaf Resources](#)
- [Red Leaf Presentation](#)
- [Video about Red Leaf](#). EcoFLight.

- [Red Leaf oil shale update](#)
- [Shell Mahogany Research Project](#)
- [Temple Mountain Energy](#)
- [TomCo Energy](#)
- [National Oil Shale Association](#)

DOCUMENTS

- [1967 - Northcutt Ely's Water Budget for Oil Shale Production.](#)
- [1967 - 4th symposium on oil shale.](#) Colorado School of Mines.
- [1974 - Oil Shale Development.](#) League of Women Voters.
- Oil shale library. Headwaters Institute.
- [2011 - Testimony of Bill Eikenberry \(PIONEERS Act\)](#)
- [2010- Oil Shale in the West: 14 Unanswered Questions.](#) Headwater Economics.
- [2010 - Policy Analysis of Water Availability and use Issues for Domestic Oil Shale and Oil Sands Development.](#) Univ. of Utah.
- 2010 - Oil shale update. National Oil Shale Association.
- [2010 - CERES Report on Oil Shale/Water Nexus.](#)
- [2010 - Energy-Water Nexus: Better Understanding of Water Resources.](#) GAO.
- 2008 - Oil Shale Report. Congressional Research Service.
- [2008 - Water Rights and Oil Shale.](#) Congressional Research Service.
- [2012 - Energy Water Nexus for Utah](#)
- [Oil Shale Politics in Utah: Holding Government Officials, Lobbyists, and Corporate Management Accountable to the Public](#)

ECONOMIC VIABILITY

- [2014 - Updated: Energy Initiatives & Imperatives for Utah's 10-Year Strategic Energy Plan 2.0.](#) Governor Herbert.
- [2014 - Drilling Deeper: A Reality Check on US Government Forecasts for a Lasting Tight Oil & Shale Gas Boom.](#) Hughes.
- [2013 - Executive Summary: Tar Sands Oil Shale Market Assessment.](#) U of U.
- [2013 - Oil Shale Market Assessment.](#) U of U.
- [2012 - Investor Oil Shale Risks.](#) CERES.
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ENDANGERED AND THREATENED SPECIES

- [Critical Habitat Designation](#). USFWS.
- [Mexican-spotted owl](#)
- [Greater sage grouse](#)
- Graham's Penstemon (beardtongue) ([Photo](#)) ([Recent news](#)) ([Aid to identify](#))
- [Screen of endangered species at Red Leaf Resources](#)
- [Map 01 & Map 02: endangered species @ Red Leaf Resources](#)
- [Critical Habitat Map](#). The Wilderness Society.
- [Graham's beardtongue](#). Salt Lake Tribune.

EPA - ENVIRONMENTAL PROTECTION AGENCY

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[Oil Shale and Tar Sands web page](#). Utah Geologic Survey.

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- [1975 - Mineral Resources of Uintah Ouray Reservation](#). USGS.

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- [Uinta Basin Geology](#)

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- [2010 - Mexican spotted owl critical habitat decision](#)
- [2010 - History of Mexican spotted owl appeal](#)

MAPS & GIS

- BLM PEIS: [Tri-state deposits](#)
- [Uinta Basin](#)
- **Green River Refinery** (proposed) ([click here](#))

SITLA

- [Oil shale resource ownership](#)
- [Parcels in Grand County](#) (14.9%; about 550 sq. miles)

University of Utah

- [Interactive Map](#)

PHOTOS

- [Book Cliffs Divide Road Grand County; Reduced](#)
- [East Canyon Grand County Approach; Reduced](#)
- [Red Leaf Resources @ Indian Ridge, June 2010](#)

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- [6/15/10 - Wildflower vs. Oil Shale](#). Salt Lake Weekly.
- [11/30/10 - GAO: More research needed on oil shale, water](#)
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- [Oil Shale Facts](#)
- [Fossil Foolishness](#). Western Resource Advocates
- [Northern Rockies Rising Tide](#)
- [CERES Report on Oil Shale/Water Nexus](#).
- [Tar Sands: Feling the climate crisis](#). FOE Europe.
- [Dirty Oil](#). Greenpeace.
- [2011 - Between a Rock and a Dry Place: The Impact of Oil Shale Development and Climate Change on the Colorado River Basin Water Supply](#). NRDC

TRADE ASSOCIATIONS

- [White Paper](#). Utah Mining Association.

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- [2009 - Oil Shale Report](#). University of Colorado at Boulder.
- [University of Utah ICSE Digital Repository](#)

USGS

- [Oil shale and tar sands interactive web page](#) (excellent resource)
- [1995 - Surface disturbances and the role of accelerating erosion](#). Belnap.

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- [Public records](#): Utah Oil, Gas & Mining. (Username and password is ogmguest)
- [FTP Site](#). Utah Oil Gas & Mining
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- [1980 - An Assessment of Oil Shale and Tar San Development](#)
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- [2009 - Approval of PR Springs strip mine for tar sand](#). UDOGM.
- [2010 - Notice regarding PR Springs Mine to Grand County Council](#). UDOGM.
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- [Fossil Foolishness](#). Western Resource Advocates.
- [A film by Leslie Iwerks](#)
- [The Tar Sands Blow](#)
- [Tar Sands](#), Canadian Broadcasting Corporation
- [Red Leaf Resources](#). EcoFLight.

WILDLIFE

Southest Utah (includes East Tavaputs Plateau)

- [Amphibian Inventory](#). DWR.
- [Avian Inventory](#). DWR.
- [Bison Reintroduction](#). DWR.
- [Black Bears](#). DWR
- [Ecosystem Evaluation](#). DWR.

- [Mammal Inventory](#). DWR.
 - [Reptile Inventory](#). DWR.
-

Permaculture

Permaculture is an approach to design self-sufficient and resilient communities with agricultural systems that utilize local natural resources and free ecological services. Permaculture as a philosophy of working with, rather than against nature; of protracted and thoughtful observation rather than protracted and thoughtless labor; and of looking at plants and animals in all their functions, rather than treating any area as a single project system.

[Community Rebuilds](#) (Moab)

[Community Supported Agriculture \(CSA\)](#). USDA.

[Earthship Biotecture](#) (New Mexico)

[Natural Building Network](#)

[Permaculture Research Institute](#) (Australia)

[Rural development programs](#). USDA

[Rainwater Harvesting](#) (Tucson)

[Regenerative Design Institute](#)

[Regenesis Group](#)

[Solviva](#) web page

DOCUMENTS

[2004 - The Precautionary Principle Handbook](#)

Photos



Colorado River from pedestrian bridge in Moab

Colorado River Bridges

- Moab's first bridge ([closeup](#)); ([looking upstream](#));
- [Repeat photography at Courthouse Wash](#)
- [1921 - Colorado River snow melt at Courthouse Wash](#). Utah Historical Society.

Floods

- [1921 - Colorado River snow melt at Courthouse Wash](#). Utah Historical Society. [Colorado River Bridge](#); Note: Matrimony Spring area is inundated.
- [1983 - Snow melt flood: overlooks the bridge and wetlands.](#)
- [1983 - Snow melt flood: overlooks Tex's Riverways and Atlas Uranium Mill. \(closeup of mill\)](#)
- 2010 - Cloudburst at Mineral Bottom: #01; #02; #03;
- [2015 - Packcreek: a July cloudburst flood receding](#)

Moab City

- [1914 - At Main and Center streets](#)

Potash

- [Intrepid Potash Evaporation Ponds](#)

Uranium Mill Site at Moab

- [1905 - Colorado River floodplain](#). USGS.

Potash

Pinnacle Potash

- [Website for documents of water right 92-674](#)
- [Daggett County water right 41-3687](#)
- [Duchesne County water right 41-3716](#)
- [Application by Pinnacle Potash \(searchable\)](#)
- [Protest by William Love](#)
- [Protest by Canyonlands Watershed Council](#)
- [Protest by Grand Water & Sewer Service Agency](#)
- [Protest by Living Rivers](#)
- [Protest by National Park Service](#)
- [Proof of Publication](#)
- [Protest by Bureau of Reclamation](#)
- [Map of Pinnacle Potash Sections](#)
- [Powerpoint presentation](#). NPS.

Water right application for potash exploration near Canyonlands Field Airport

- [2012 - State Engineer denies the water right application](#)
- [Website for documents of #01-1183](#)
- [Application to Appropriate Water For Potash Exploration](#)
- [BLM protest](#)
- [Norman's response to protest](#)
- [NPS protest](#)
- [Water Right Arches UDWR 2011](#)
- [Water right protests combined](#)
- [Map - Watersheds Arches NP](#)

K2O potash exploration near Hatch Point

- [2011 - Water right for potash development near Hatch Point](#)
- [K2O Utah Project](#)
- [Map of K2O project](#)
- [K2O Geophysical Report](#)
- [K2O Corporate Report](#)

Photos

- [Intrepid Potash Evaporation Ponds](#)

News clips

- [Local Groups Protest Water Application for Proposed Potash Mine](#)
- [BLM Okays Potash Exploratory Drilling Project Near Labyrinth Canyon](#)
- [BLM Gives Green Light to Hatch Point Potash Exploration](#)

Corporate Websites

- [Pinnacle Potash](#) (no information provided)
 - [Paradox Basin Resources Corporation](#) (Canada)
 - [American Potash](#) (Magna Resources, Canada)
 - [K2O Potash](#) (Australia)
 - [Intrepid Potash](#)
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Presentations

[June 3, 2010 - Watershed Planning for Moab Area Watershed Council](#)

[May 20, 2010 - Forming a Watershed Council for the Moab Area](#)

[May 20, 2010 - Utah Water Quality](#)

[May 20, 2010 - Proposed Watershed Council for Moab and Castle Valley](#)

[May 20, 2010 - West Colorado River Watershed Coordinator](#)

[May 20, 2010 - Watershed Assessment](#)

[May 14, 2010 - Proposed Green River Nuclear Power Plant](#)

[May, 2010 - San Juan County Lands Bill](#)



Public Notices

NOTICE OF PUBLIC MEETINGS

[Times - Independent](#)

[State of Utah](#)

[City of Moab](#)

[Grand County](#)

LEGAL NOTICES

[Utah](#)

San Juan County

Angel Arch in the Needles District

San Juan County has a land area of 7,820 square miles and the estimated population is 15,055 (2008), which is 1.8 people per square mile. As of the census in 2000 the county seat, Monticello, had a population of 1,958, and Blanding had a population of 3,162.

WEB PAGES

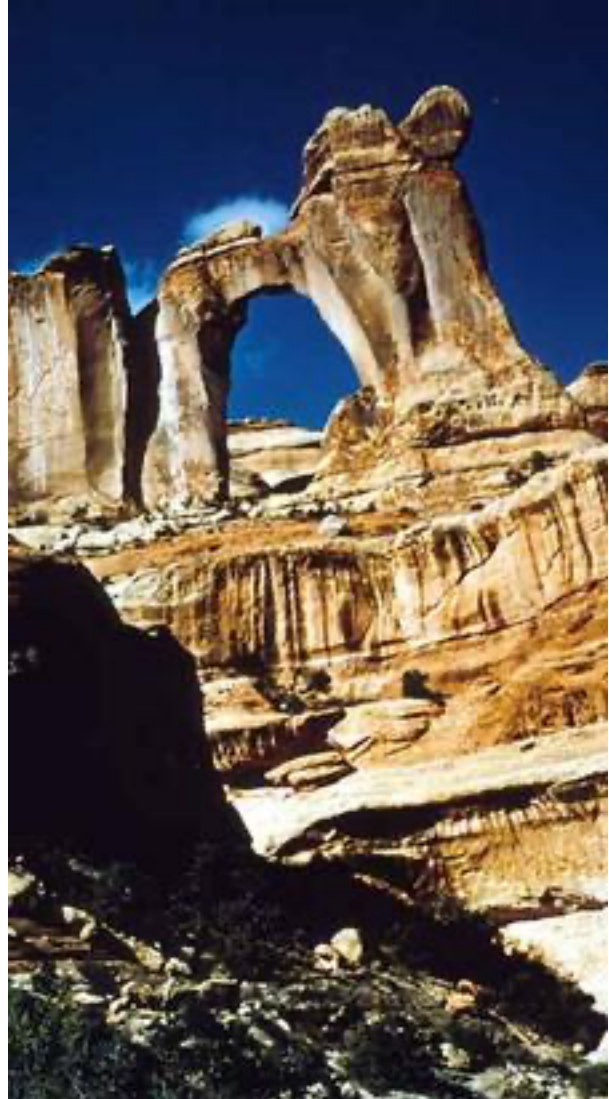
- [San Juan County Commission](#)
- [Southeast Utah Association of Local Government](#)

SAN JUAN COUNTY WATER CONSERVANCY DISTRICT

- [Contact Information](#)

SAN JUAN SPANISH VALLEY SPECIAL SERVICE DISTRICT

- [Order of the State Engineer](#)
- [Web site for Water Right 09-2349](#)
- [Web site for scanned documents Water Right 09-2349](#)
- [40-year Plan](#)
- [2011- Water Right Change Application](#) (Water Right 09-2349)
- [Web site for Water Right 09-2349](#)
- [Web site for scanned documents Water Right 09-2349](#)
- [2011 - SJSVSSD letter to Nature Conservancy](#)
- [Statement of a Water Right Segregation](#)
- [Historic Property Evaluation](#)
- [Corrections to the application](#)
- Map: [Proposed wells and point of diversion](#)
- Protest: [Living Rivers](#)
- Protest: [Department of Interior](#)
- Protest: [Moab City and here](#)
- Protest: [Canyonlands Watershed Council](#)



- Protest: [Grand Water & Sewer Service District](#)
- Protest: [Nature Conservancy](#)
- Answer to Protest: [SJSVSSD](#)

SITLA

- [2009 - Spanish Valley Block Plan](#)

SPANISH VALLEY OWNER

Amenities project one-mile below the Potash Boat Ramp

- [Water Right #01-292](#)
 - [Administrative history](#)
 - [Protest by Living Rivers](#)
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SITLA



Castleton Tower

STATE INSTITUTIONAL TRUST LANDS ADMINISTRATION (SITLA)

[Home page](#)

[2002 - Utah School Trust Lands](#). Grand Canyon Trust.

[2011 - Financial Report Addendum](#). Grand Canyon Trust.

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[1990 - Utah's School Trust Lands: A Century of Unrealized Expectations](#). Harmer.

NEWS

[Governor Herbert dissappointed with trust land bonuses](#) (10/23/09)

MAPS

- [Digital Plat Maps](#)
- [Map of section ownership in Utah](#)
- [Map of Green River Industrial Zone](#)
- [Map of designated state land sections](#)
- [Map state sections in Grand County](#)

- [Map state sections in San Juan County](#)
 - [Map sate section in Emery County](#)
 - [Map of oil shale resource ownership in Utah](#)
 - [Utah Recreational Land Exchange Act Grand County](#)
 - [Map of Green River Industrial Zone](#)
 - [Map of designated state land sections](#)
 - [Map state sections in Grand County](#)
 - [Map state sections in San Juan County](#)
 - [Map sate section in Emery County](#)
 - [Map of oil shale resource ownership in Utah](#)
 - [BLM and SITLA oil and gas leases](#)
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Soils

Holding precious soil in place: Biological soils crusts

Web site: [Moab US Geological Survey soil crust web](#)

Field guide: [Biological soil crusts in the western U.S.A.](#)

[1991 - Soil Survey of the Canyonlands Region.](#) USDA.



Tourism

DATA

- [2020 - Overnight Rental Inventory](#). Grand County.

SOLUTIONS

- [2023 - Amenity Trap: How High Amenity Communities Can Avoid Being Loved To Death](#). Headwaters Economics.
-

Uranium



Moab's uranium mill waste pile

Moab was once the "Uranium Capital of the World." That distinction ended in the 1980's when demand for this rare metal dropped significantly. Currently, there are only two uranium mills in the United States near Blanding, Utah and Canon City, Colorado. Mitigating past uranium mills for safety and health laws in southeast Utah has occurred in Green River, Monticello, and Mexican Hat. The cleanup for the Moab Mill, the second largest tailings pile in

the nation, began in 2009 and will take 10-years for an estimated cost of \$1 billion dollars.

Home page of [Uranium Watch](#)

Home page of [Sheep Mountain Alliance](#)

La Sal Complex Plan (uranium mining expansion)

- 2010 (December) - [La Sal Complex Plan Environmental Assessment by Bureau of Land Management](#)
- [Click here](#) to visit dedicated BLM website
- [Click here](#) to download the complete EA
- [La Sal Complex property map](#)
- [La Sal Complex development stages map](#)
- [La Sal Complex general location map](#)

Pinon Ridge Uranium Mill by Energy Fuels. (Proposed at Paradox Valley, CO)

- [Website of Colorado Department of Public Health and Environment](#) (CDPHE)
- [Map: Location of Pinon Ridge proposed mill](#)
- [Review by the CDPHE](#)

Energy Fuels Application

- [Volume One complete](#)
- [Volume Two complete](#)
- [Volume Three complete](#)
- Volume Four

- Volume Five
- Volume Six
- Volume Seven
- Volume Eight
- Volume Nine
- Volume Ten
- Volume Eleven
- Volume Twelve
- Volume Thirteen
- Volume Fourteen
- Volume Fifteen

Mancos Resources

This proposed uranium milling operation in Green River, Utah was unable to secure a water right for their operation.

[Click here](#) to read the administrative record.

Sheep Mountain Alliance

- [Sheep Mountain Alliance Letter](#)
- [Environmental Comments](#)
- [Geological Comments](#)
- [SocioEconomic Comments](#)
- [Wildlife Comments](#)

Northern Arizona Proposed Withdrawal Draft EIS (Grand Canyon Watershed)

Comments due April 4, 2011

- [BLM web page](#)
- [Draft EIS](#)
- [Appendices](#)
- [Reports](#)
- [Maps](#)
- [USGS analysis](#)
- [USGS Map](#)

Nuclear Power Plants

[2012 - Dangers of living near nuclear facilities](#). NAS.

UTAH GOVERNMENT

[Home page](#)

Public records: Utah Oil, Gas & Mining. (Username and password is ogmguest)

FTP Site. Utah Oil Gas & Mining

URANIUM MINING AND MILLING

2004 - White Mesa Archeology. Glen Canyon Group, Sierra Club

2005 - A Technical Report Toward Reclaiming Uranium Mill Tailings. Dohrenwend and Greenbaum.

2008 - Uranium Mining. Southwest Hydrology.

WEB PAGES

Uranium Watch home page

Wise Uranium (Moab Mill Reclamation)

Moab City/Grand County UMTRA Project Information

Department of Energy: Moab UMTRA Project

USGS



Green River in Grand County

See also sections on [Geology](#) & [Ground-Water](#)

UNITED STATES GEOLOGICAL SURVEY

- [Water Resources of the United States](#)
- [Utah Water Science Center](#)
- [1960 - A Primer on Water by Walter Langbein and Luna Leopold.](#)
- [Colorado Plateau Dust Storms](#)

USGS data

- [maps, aerial photos, satellite imagery](#)
 - [real-time water data for the nation](#)
 - [mean annual flow in cfs of Colorado, Green, San Juan & San Rafael](#)
 - [mean annual flow in maf of Colorado, Green and San Juan](#)
 - [mean annual and monthly flow at Lees Ferry in cfs](#)
 - [mean annual flow in maf at Lee's Ferry since 1963](#)
 - [monthly annual flow in cfs of Colorado, Green & San Juan](#)
 - [photographic library](#)
 - [Monitoring dust events in the Southwest](#)
-

Utah



Upheaval Dome

FROM THE GOVERNOR

Energy

- [2010 - Governor's 10-year Energy Plan](#) (Draft).
- [2011 - Governor's 10-year Energy Plan](#) (Final).
- [2013 - Utah's Water Future: 50-year Strategy](#)

Water

- [2017 - Recommended Utah State Water Strategy & Executive Summary](#). Envision Utah.
- [2013 - Utah's Water Future 50-year Strategy](#)

UTAH DEPARTMENT OF WORKFORCE SERVICES

- [Information and Services](#)

UTAH DEPARTMENT of ENVIRONMENTAL QUALITY (DEQ)

- [Utah DEQ Watershed Planning Program](#)
- [Utah DEQ Watershed Fact Sheets](#)
- [Southeast Colorado River Watershed](#)
- [Map: Southeast Colorado River Basin](#)
- [Bibliography: Southeast Colorado River Basin](#)
- [Utah Non-Point Pollution Program, EPA](#)

- [Southeast Colorado River Basin, Sec. 1](#)
- [Southeast Colorado River Basin, Sec. 2](#)

Utah Division of Oil, Gas and Mining (UDOGM)

- [UDOGM permit files \(complete\)](#)
- **(Username and Password: ogmguest)**
- [UDOGM Board Notes and Dockets](#)

UTAH DIVISION OF WATER RIGHTS

- [Home page](#)
- [Water rights information and queries](#)
- [Search locations with Google Earth](#)
- [Well log search engine](#)
- [Water Rights Area Map with Policy by Area](#)
- [Studies by Utah Division of Water Rights](#)

UTAH WATERSHED COORDINATING COUNCIL

- (Three meetings per year: Spring, Summer & Fall)
 - [Home page](#)
-

Waste



Book Cliffs

Grand and San Juan Counties have a convenient transportation corridor for the nation and hosts an interstate highway and a railroad. But it also conveys the entire regional water supply of the southwestern United States via the Colorado River. How we manage toxic waste in this landscape is a serious responsibility.

It is also important to be aware of extraordinary rates of consumption and waste that occur in this nation, and to instead rethink, reduce, recycle and reuse our natural resources wisely.

[Canyonlands Community Recycling](#)

[Solid Waste Operations Study](#)

[Area Recycling Directory](#)

[Canyonlands Community Recycling Center](#)

[Solutions of Moab](#)

[Wabi Sabi thrift stores](#)

[Green Cup Challenge](#)

Water



Pot Hole Point in Canyonlands National Park

Grand County discharges approximately 315,000 acre-feet annually into the Colorado River and 108,000 acre-feet into the Green River, for a total of 423,000 acre-feet.

Total irrigated land in Grand County is 3,859 acres, which consumes 19,808 acre-feet annually.

It is estimated wells and springs discharge an estimated 6,400 acre-feet per year. The total consumption for the County's groundwater sources are estimated to be 4,534 acre-feet and distributed in the following manner:

- 2,776 acre-feet/year for residential use
- 818 acre-feet/year commercial use
- 940 acre-feet/year industrial purposes
- 704 acre-feet/year secondary uses

The regional evaporation rate is about 57 inches per year.

The documents below include such water related topics as groundwater, surface water, precipitation, sediment transport, flooding and climate change.

[1960 - A Primer on Water by Walter Langbein and Luna Leopold.](#)

For a more detailed list please visit [On The Colorado](#)

FROM THE GOVERNOR

[2013 - Utah's Water Future: 50-year Strategy](#)

UTAH DISVISION OF WATER RESOURCES

- [Open Water Data Portal](#)
- [2015 - Report: Utah Municipal and Industrial Water Use](#)

UTAH DIVISION OF WATER RIGHTS

- [Home page](#)
- [Water rights information and queries](#)
- [Search locations with Google Earth](#)
- [Well log search engine](#)
- [Water Rights Area Map with Policy by Area](#)
- [Studies by Utah Division of Water Rights](#)

UTAH STATE

- [2008 - Utah Watershed Study](#)
- [Cloud Seeding Program](#)

CLIMATE CHANGE DOCUMENTS

- [2007 - Colorado River Basin Water Management: Evaluating and Adjusting to Hydroclimatic Variability.](#) National Research Council. National Academy of Sciences.
- [2007 - Warming may create substantial water supply shortages in the Colorado River basin.](#) McCabe and Wolock. Geophysical Research Letters.
- [2008 - Stationarity Is Dead: Whither Water Management.](#) Milly et al. Science. Death of stationarity [presentation](#) by Stephen Gray.
- [2008 - Climate Change in Colorado: A Synthesis to Support Water Resources Management and Adaption.](#) University of Colorado at Boulder.

- [2009 - Irreversible climate change due to carbon dioxide emissions](#). Solomon et al.
- [2007 - Past Peak Water in the Southwest](#). Hoerling & Eischeid. Southwest Hydrology.
- [2009 - Utah outlook on climate change](#). Steenburgh.
- [2009 - Sustainable water deliveries from the Colorado River in a changing climate](#). Barnett & Pierce.
- [The "Dealing With Drought: Adapting to a Changing Climate" Workshops: A Report for the Colorado Water Conservation Board](#). University of Colorado/ NOAA.

CONSUMPTION

- [Moab's water consumption](#) (chart)
-

DROUGHT and FLOW MONITORING

- [Regional Drought Early Warning System: Upper Colorado River Basin](#)

GROUNDWATER

- [USGS groundwater monitoring in Grand County](#)
- [Ground-water Information list for Utah](#)
- 1971 - [Geology and water resources of the Spanish Valley area, Grand and San Juan Counties, Utah](#). US Geological Survey. Sumsion.
- 1977 - [A digital model of ground-water flow in Spanish Valley, Grand and San Juan Counties, Utah](#). US Geological Survey. Eychaner.
- 1990 - [Ground-water conditions in the Grand County area, Utah, with emphasis on the Mill Creek-Spanish Valley area](#). US Geological Survey. Blanchard.
- 1991 - [Geohydrology of Mesozoic rocks in the upper Colorado River basin in Arizona, Colorado, New Mexico, Utah and Wyoming, excluding the San Juan basin](#). US Geological Survey. Freethy et al.
- 1997 - [Map of recharge areas for the Glen Canyon and valley-fill aquifers, Spanish Valley area, Grand and San Juan Counties, Utah](#). US Geological Survey. Steiger et al.
- 1999 - [A summary of the ground-water resources and geohydrology of Grand County, Utah](#). Utah Geological Survey. Eisinger et al.
- 2000 - [Geohydrology and numerical simulation of ground-water flow in the central Virgin River basin of Iron and Washington Counties, Utah](#). (aquifers in Navajo Sandstone). US Geological Survey. Heilweil et al.
- 2001 - [Reconnaissance study of age and recharge temperature of groundwater near Moab, Utah](#). University of Utah. Kip Solomon.
- 2007 - [The Hydrogeology of Moab-Spanish Valley, Grand and San Juan Counties, Utah, with emphasis on maps for water-resource management and land-use planning](#). Utah Geological Survey. Lowe et al. [Plates 1-12](#).

FLOODING

- [1946 - Cloudburst floods in Utah](#). Woolley. US Geological Survey.
- [1963 - Flooding in Moab and Spanish Valley](#). Taylor.
- [2001 - Floods and riparian vegetation on the San Juan River](#). Webb et al. US Geological Survey.
- [2004 - Initial-Phase Investigation of Multi-Dimensional Streamflow Simulations in the Colorado River, Moab Valley, Grand County, Utah](#). Terry A. Kenney. US Geological Survey.
- [2005 - Paleofloods near Moab, Utah](#). Dohrenwend and Greenbaum.

HYDROLOGY

- [Studies by Utah Division of Water Rights](#)
- [Water Supply Papers for Utah](#)
- [1976 - Long-term surface-water supply and streamflow trends in the upper Colorado River basin](#). Stockton and Jacoby. National Science Foundation.
- [1988 - Hydrologic determination of the Upper Basin](#). Bureau of Reclamation.
- [1991 - Sediment Transport in the Colorado River Basin](#). National Research Council.
- [1997 - Colorado River Basin Study](#). Pontius. Western Water Policy Review Advisory Commission.
- [2007 - Medieval Drought in the Upper Colorado River Basin](#). Meko et al. American Geophysical Union.
- [2009 - Persistent Positive Atlantic Oscillation during Medieval Climate](#). Trouet et al.
- [2009 - Water supply risk on the Colorado River: Can management mitigate?](#) Rajagopalan et al.

IMPAIRED WATER

- [303d List](#)

Total Maximum Daily Loads (TMDL)

- [Castle Creek](#)
- [Mill Creek](#)
- [TMDL Reports for Utah](#)
- [Ken's Lake TMDL](#)

MOAB SOLE-SOURCE AQUIFER PROTECTION

- [Geologic Data](#)
- [Color Map](#)

- [Legend: Color Map](#)
- 2001 - [Drinking Water Source Protection Plan](#)
- 2001 - [Drinking Water Source Protection Plan](#)
- 2001 - [Skakel Springs Drinking Water Source Protection Plan](#)
- 2002 - [Drinking Water Source Protection Plan](#)
- [Sole Source Protection Planning](#). DWQ.

RESERVOIRS

- [Ken's Lake Data](#)
 - [Monticello Lake Data](#)
 - [Recapture Lake Data](#)
-

Water Planning



The wetlands at the Matheson Preserve in Moab

BUREAU OF RECLAMATION

- [1996 - Achieving Efficient Water Management](#)
- [2008 - Basin Study Framework](#). Reclamation.
- [2009 - Water Conservation Initiative](#). Reclamation.

SOLUTIONS

[2023 - Amenity Trap: How High Amenity Communities Can Avoid Being Loved To Death](#).
Headwaters Economics.

VISIONARY STRATEGIES

Ten Strategies for Climate Resilience on the Colorado River Basin

- [Homepage](#)
- [Press Release, Program Snapshot & Program Summary](#)
- [Full Report](#)
- [Appendix](#)

CASE STUDIES

- [McKenzie River Watershed Sole Source Aquifer Drinking Water Source Protection Program](#)
- [Protection Plan from the Eugene Water and Electric Board](#)
- [Massachusetts Barnes Sole Source Aquifer Protection Program:](#)
- [Barnes Aquifer Protection Committee](#)
- [City of Westfield](#)
- [Town of Easthampton](#)
- [Town of Southampton](#)
-

CLIMATE CHANGE PLANNING

- [Planning for climate change in the West](#). Lincoln Institute of Land Policy.
- [Adaption to Climate Change](#). Heinz Center.

CONSUMPTION

- [Moab's water consumption](#) (chart)

GRAND COUNTY

Grand Water and Sewer Service Agency

- [2009 - Conservation Plan](#)

Moab Ground Water Study Proposal

- [2005-Overview](#)
- [USGS Fact Sheet](#)
- [2008 Proposal](#). USGS.
- 2010 - USGS Presentation
- [2014 - Measured Groundwater Discharge](#)

NATIONAL FOREST SERVICE

- [Groundwater, Drinking Water and Sole Source Aquifers on the Moab Unit](#)

NATIONAL PARK SERVICE

Canyonlands National Park (Southeast Utah Group)

- [1999 - Water Resources Management Plan](#)

Glen Canyon National Recreation Area

- [1987 - Glen Canyon Water Resources Management Plan](#)

CITIZEN GROUPS

Non-profit

- [Utah Water Users Association](#)
- [2009 - Utah Water Study](#). League of Women Voters.
- [Mill Creek Partnership documents](#)

UTAH STATE

- [Sole Source Protection](#)
- [Water Plans](#)
- [State Water Plan](#)
- [Uinta Basin Water Plan](#)
- [West Colorado River Plan](#)
- [SE Colorado River Plan](#)
- [Drought Plan](#)
- [Utah Division of Water Rights](#)
- [Ground-water Information list](#)
- [2012 - Energy Water Nexus for Utah](#)
- [2013 - Utah's Water Future 50-year Strategy](#)

REGIONAL WATER PLANNING

Chartered by Congress

- [1998 - Report of Western Water Policy Review Advisory Commission](#)

Western Governors Association ([Home](#))

- [2004 - Creating a drought early warning system.](#)
- [2006 - Water needs and strategies for a sustainable future.](#)
- [2008 - Update: Water needs and strategies for a sustainable future.](#)

Arizona

- [Water Planning Division](#)
- [Drought Plan](#)

California

- [Colorado River Use Plan](#)
- [Drought Plan](#)

Colorado

- [Drought Plan](#)
- [Upper Colorado Framework](#)
- [Gunnison Framework](#)
- [San Juan & Dolores Framework](#)
- [Yampa & White Framework](#)

Nevada

- [Water Plan](#)
- [Drought Plan](#)
- [Water Plan](#). Southern Nevada Water Authority

New Mexico

- [State Water Plans](#)
- [Drought Plans](#)

Utah

- [Water Plans](#)
- [State Water Plan](#)
- [Uinta Basin Water Plan](#)
- [West Colorado River Plan](#)
- [SE Colorado River Plan](#)
- [Drought Plan](#)

Wyoming

- [Water Plan](#)
- [Drought Plan](#)

RESTORATION

- [2011 - Ecological values of beavers in Esplanade Watershed](#). ECONW.

UNIVERSITY

- [2000 - New Watershed Source Book](#). University of Colorado at Boulder.
 - [2004 - The Precautionary Principle Handbook](#)
-

Water Right Numbers

Ken's Lake is nearly empty in 2018

[Search engine for water right information](#). Utah Division of Water Rights.

Proposed Green River Nuclear Power Plant

- [#91-5233 - Kane County Water Conservancy District](#)
- [#09-462 - San Juan County Water Conservancy District](#)
- [#89-74 - Kane County Water Conservancy District](#)
- [#89-1285 - Kane County Water Conservancy District](#)

San Juan Water Conservancy District

- [#09-2349 - Spanish Valley Water Right](#)

Water Horse Resources (Aaron Million)

- [#41- 3747 - Green River Water Right](#)

Pinnacle Potash transfer from Green River

- [#41-3687 - Green River Water Right](#)
- [#92-674 - Green River Water Right](#)
- [#41-3716 - Green River Water Right](#)

Red Leaf Resources (Kerogen Shale Mine)

- [#49-2330 - Green River Water Right](#)

•

US Oil Sands (Tar Sands Mine)

- [#49-2274 - Green River Water Right](#)

Enefit American (Kerogen Shale Mine)

- [#49-258 - Green River Water Right \(Deseret Generation & Transmission\)](#)

Moab Irrigation Company

- [#05-1068](#) (admin)
- [#05-2013](#) (admin)

City of Moab

- [#05-2105](#) (admin)- Skakel Spring
- [#05-2103](#) (admin) - Skakel Spring
- [#05-2740](#) (admin) - Skakel Spring
- [#05-2007](#) (admin) - McConkie Spring
- [#05-2008](#) (admin)- Sommerville Spring #1

- [#05-251 \(admin\)](#) - Sommerville Spring #2 & 3
- [# 05-734 \(admin\)](#)
- [# 05-716 \(admin\)](#)

[Search engine for water right information](#). Utah Division of Water Rights.

WATER RIGHTS GRAND COUNTY WATER CONSERVANCY DISTRICT (GCWCD)

Subsidiaries are as follows:

- Spanish Valley Water & Sewer Improvement District (SVWSID)
- Grand Water and Sewer Service Agency (GWSSA)

DOCUMENTS

- [2008 - 40-year Plan](#). GWSSA.
- [2013 - Proposal for Reduced Flow DRAFT 03](#). GWSSA.
- [2016 - Water Master Plan](#). Sunrise Engineering.
- [2018 - 40-year Plan](#). Sunrise Engineering.

GREEN RIVER BASIN WATER RIGHTS

[92-176](#); (admin): This Green River water right has been extinguished.

[92-649](#); (admin): Green River near Green River Travel Center for 30 acre-feet.

COLORADO RIVER BASIN WATER RIGHTS

[01-93](#) Status: disallowed (abandoned through non-use)

*[01-1128](#); (admin): Colorado River @ Dewey Bridge for 8 acre-feet with priority date of 1969. Segregated from [05-1709](#) in 1959.

[01-1133](#); (admin): Colorado River @ Mayberry Preserve for 147.55 acre-feet with priority date of 1969. Segregated from [05-1709 \(admin\)](#) in 1959.

[05-148](#); (admin): Groundwater well of Spanish Valley Water and Sewer Improvement District

[05-475 \(admin\)](#): Underground Water Well in aquifer of Glen Canyon Group for 723.98 acre-feet with a priority date of 1978.

[05-492 \(admin\)](#): SVWSID; underground water well in Valley Fill aquifer for 0.111 cfs with priority date of 1963.

[05-681 \(admin\)](#): GWSSA; underground water well in Valley Fill aquifer for 92.296 acre-feet with priority date of 1978.

05-1062 (admin): SVWSID; 2 underground water wells for 28.35 acre-feet near Johnson's-Up-On-Top with priority of 1962.

05-1523 (admin): Moab Irrigation Company; 4,945.738 acre-feet along Mill Creek with priority of 1890.

*05-1709; (admin): Colorado River @ Mayberry Preserve for 1028.736 acre-feet with priority date of 1969.

05-1285 (admin): 7 underground water wells along floodplain of Mill Creek near Powerhouse Lane for 2144.318 acre-feet with a priority of 1973.

05-1386 (admin): Withdrawn. Surface water to appropriate 2,000 acre-feet at Moab Sewage Treatment Plant.

05-1458 (admin): Colorado River near Matrimony Spring & mouth of Mill Creek. Mill Creek at Sheley Tunnel Diversion for 2,220 acre-feet with a priority date of 1966.

*05-1709 (admin): Colorado River near Mayberry Preserve for 1028.736 acre-feet with a priority of 1969.

05-1868 (admin): Mill Creek Tunnel Diversion for 15 cubic feet per second with priority date of 1981.

05-1977 (admin) Destroyed

05-2324 (admin) Withdrawn

05-2700 (admin): Underground water well on Wilson Mesa for 0.98 acre-feet with priority date of 1891.

05-2802 (admin): Underground water well near Mill Creek and Peartree Lane for 110 acre-feet with priority of 1973.

05-3163 (admin): Colorado River near mouth of Mill Creek for 622 acre-feet with a priority of 1958.

05-3343 (admin): Six underground wells near White's Ranch for 395.17 acre-feet with a priority of 1959.

05-3486 (admin): Underground well in Valley Fill near Chapman Lane for 118.7 acre-feet with priority of 1969. Ken's Lake is nearly empty in 2018

[Search engine for water right information.](#) Utah Division of Water Rights.

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Watershed



Westwater Canyon

Note: The planning document of the Canyonlands Watershed Council is currently under development. To view our progress, please click [here](#).

GRAND COUNTY WATERSHEDS

Westwater Canyon Watershed

[EPA](#)
[USGS](#)

Lower Dolores River Watershed

[EPA](#)
[USGS](#)

Kane Springs Watershed

[EPA](#)
[USGS](#)

Watershed Tools



Professor Valley

MEETING FACILLITATION

- [The Art of Facillitation](#)
- [Federal Advisory Committee Act](#) (FACA)

BUREAU OF RECLAMATION

- [Achieving efficient water managment](#)

UTAH STATE UNIVERSITY

- [Watershed Resources](#)
- [Bear River Watershed Council](#)

WATERSHED TOOLS

Center for Watershed Protection

- [Conducting a Watershed Protection Audit](#)
- [Smart Watershed Benchmarking Tool](#)
- [Watershed Vulnerability Analysis](#)

WATERSHED PLANNING SAMPLES

- [Sample brochure](#). Kentucky Waterways Alliance.
- [Know Your Watershed](#). Purdue University
- [Watershed planning](#). Arizona NEMO
- [Guide to Developing Watershed Plans](#). Ohio
- [Watershed Planning](#). Illinois Watershed Management Clearinghouse.
- [Oregon Watershed Councils](#)
- [Roaring Fork Watershed Plan](#)

ADDITIONAL INFORMATION

- [Center for Watershed Protection](#).
- [Watershed Management](#). Southwest Hydrology.
- [National NEMO Network](#)
- [Source Water Collaborative](#)

- [Smart About Water](#): Helping America's Small Communities Protect Their Source Water
 - [Center for the Advancement of the Steady State Economy](#)
 - [The Watershed Approach: Solving problems and protecting vital resources](#)
 - [Water Footprint Network](#)
-

Wildlife

SOUTHEAST UTAH (includes East Tavaputs Plateau)

- [Amphibian Inventory](#). DWR.
 - [Avian Inventory](#). DWR.
 - [Bison Reintroduction](#). DWR.
 - [Black Bears](#). DWR
 - [Ecosystem Evaluation](#). DWR.
 - [Mammal Inventory](#). DWR.
 - [Reptile Inventory](#). DWR.
 - [1979 - Threatened and Endangered Plants of Willow Creek Drainage, Uinta Basin Utah](#). Shultz.
-

Wildlife Conservation

Utah Conservation Data Center. "An integral part of the Utah Division of Wildlife Resources, the Utah Conservation Data Center (UCDC) is the central repository for Utah biodiversity information. Although the UCDC focuses primarily on Utah's rare native species and other high-interest species (game animals and raptors, for example), information on all Utah vertebrate wildlife species, many invertebrate species, and numerous plant species is available."

ENDANGERED SPECIES

- [Critical Habitat Designation in Uinta Basin](#). USFWS.
-