

3.0 AFFECTED ENVIRONMENT

3.1 INTRODUCTION

This chapter presents the potentially affected environment (i.e., the physical, biological, social, and economic values and resources) of the Project Area as identified by the Interdisciplinary Team Analysis Record Checklist found in Appendix B and presented in Chapter 1 of this assessment. This chapter provides the baseline for comparison of impacts/consequences described in Chapter 4.

3.2 GENERAL SETTING

The proposed project is located on a ridge west of Atchees Wash, east of Archy Bench, and one mile south of the White River. The topography consists of flat rocky ridges dissected by deep narrow canyons. Vegetation in the area includes Utah juniper, pinyon pine, black sagebrush, shadscale, galleta grass, Gardner's saltbush, prickly phlox, horsebrush, bud sage, American kochia, and cheat grass, with either pinyon and juniper trees or sagebrush as the dominate vegetation type. The Project Area, and the White River to the north, provide habitat for numerous species of birds, mammals, reptiles, amphibians, fish, and invertebrates.

3.2.1 Areas of Critical Environmental Concern

No ACECs (as designated by the Book Cliffs RMP) currently exist within the Project Area. However, under the Vernal FO Draft RMP (2005), portions of the proposed White River ACEC would occur within the Project Area. Under various alternatives of the Draft RMP, up to 3,507 acres of the proposed White River ACEC would fall within the Project Area (Figure 6).

The White River ACEC nomination cited the following relevant and important values: first, Goblin City, "an area of unique, spectacular rock spires, ... is a major destination point for White River boaters"; second, "a cottonwood grove campsite, now used by boaters ... where visitors can camp and explore the nearby fragile geologic formations"; third, the "river [which] is one of the few places in Utah and adjoining states where a wild river has gentle flows that can be floated without specialized equipment and technical skills", and fourth, the White River canyon and adjacent landscape which "offers spectacular scenery, wildlife viewing, and rich riparian vegetation to increasing numbers of recreationists from many states." The campsite, Goblin City overlook, and landscape adjacent to the White River fall within the Project Area boundary.

Should an alternative of the Draft RMP be selected that includes designation of the White River ACEC, the existing leases within the ACEC area would be pre-existing rights. Therefore, the lessee would have the right to be provided reasonable access to the leased parcel and to install or use existing off-lease facilities necessary to develop the gas resources of the leases.

3.2.2 Cultural Resources

A Class I cultural resource inventory was conducted for Enduring's Rock House Project Area. The objective of the inventory was to identify the extent of previous cultural resource investigations within the Project Area and to identify the number, locations, types, and significance of previously documented cultural sites within the same area. Although it may not accurately reflect the actual site densities or site types in the Project Area, this information can be used to predict and evaluate potential impacts to historic and archaeological resources resulting from the development of the area.

Section 106 of the National Historic Preservation Act (NHPA) requires Federal agencies to consider the effects of their undertakings on such properties, following regulations issued by the Advisory Council on Historic Preservation (ACHP) (36 CFR 800). Criteria for evaluating the significance of resources for listing on the National Register of Historic Places (NRHP) are outlined in 36 CFR 800.10, "National Register Criteria." The quality of significance in American history, architecture, archaeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and,

- a) That are associated with events that have made a significant contribution to the broad patterns of our history.
- b) That are associated with the lives of persons significant in our past.
- c) That embody the distinctive characteristics of a type, period, or method of construction, or represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction, and,
- d) That have yielded, or may be likely to yield, information important in prehistory or history.

Cultural Background

The cultural-chronological sequence in the Project Area includes the Paleoindian (ca. 12,000-8,000 years before present (B.P.)); the Archaic (ca. 8,000-1,500 B.P.), which can be further subdivided into Early, Middle, and Late periods; the Fremont (A.D. 500-1300); the Protohistoric (A.D. 1200-1750), and Euro-American stage, which began with the arrival of Europeans in the eighteenth century. These periods represent those in which significant cultural resources may have been introduced into the Project Area

Native American Religious Concerns

The American Indian Religious Freedom Act of 1978 directs Federal agencies to identify the presence or absence of Native American Religious sites and Traditional Cultural Properties present in a Project Area through Tribal consultation and coordination. The BLM is responsible for consultation and coordination as part of the EA process. If Native American Religious sites or Traditional Cultural Properties are documented in the Project Area, the BLM will work with the appropriate Tribe(s) to avoid impact to the archeological site(s) or artifact(s)

Class I Inventory Results

The Class I inventory of the Project Area resulted in the identification of 18 cultural resource inventories and eight previously documented historic-period sites within the Project Area. Two of the previously documented sites were determined to be eligible for listing on the NRHP, one of which is the Rock House (42Un5015), a major historic-period site within the Project Area. Table 3-1 summarizes the known cultural resources that occur within the Project Area. Other than those identified in the cultural resource inventories conducted thus far, and the Rock House (42Un5015), there are no additional known cultural resources in the Project Area.

Table 3-1. Archaeological Sites and Isolated Finds

Site Number	Site Type	Cultural Affiliation	NRHP Assessment	Avoidance Recommendations
42Un3075	Short Term Grazing	European/American	Eligible	Avoid

Site Number	Site Type	Cultural Affiliation	NRHP Assessment	Avoidance Recommendations
	Camp		(Criterion D)	
42Un3091	Historic Temporary Camp	European/American	Not Eligible	None
42Un3132	Short Term Grazing Camp	European/American	Not Eligible	None
42Un3696	Historic Cairn	European/American	Not Eligible	None
42Un4596	Historic Trash Scatter	European/American	Not Eligible	None
42Un4597	Historic Trash Scatter	European/American	Not Eligible	None
42Un4758	Historic Temporary Camp	European/American	Not Eligible	None
42Un5015	Rock House – Historic Cabin	European/American	Eligible (Criteria A and C)	Avoid

Previous investigations in the Project Area conclude that historic sites are the dominant site type in the area. These sites include temporary camps, short term grazing camps, trash scatters, and rock cairns, all of which tend to be located on low ridges overlooking intermittent drainages. Site documentation and diagnostic artifacts suggest use of the area by European Americans, primarily on a temporary or occasional basis for sheep grazing and mining activities. Two recorded sites (42Un3075 and 42Un5015) in the Project Area have been determined to be eligible for nomination to the NRHP, and six recorded sites have been determined to be ineligible for nomination to the NRHP because they are common site types, and lack potential for providing additional data significant to the history of the area.

Prior to construction activities, a Class III cultural resource inventory (100 percent pedestrian survey) would be required to determine the number, locations, types, and significance of additional cultural resources within/near proposed development locations in the Project Area. These surveys would be conducted on a site-specific basis prior to the issuance of an APD. However, given the available information, we can anticipate that sites will most likely be associated with temporary use of the area during the historic period, and will be located on low ridges overlooking drainages. Because these site types are common in the Project Area, they are not likely to be eligible for listing on the NRHP. Sensitive sites (i.e., those eligible for listing on the NRHP) having additional research potential appear to be uncommon in the immediate area.

3.2.3 Paleontological Resources

BLM Handbook H-8270, *General Procedural Guidance for Paleontological Resource Management* (1988) guides paleontological research on BLM-administered lands. The handbook presents a classification system for ranking areas and geologic formations according to their potential to contain vertebrate fossils or noteworthy occurrences of invertebrate or plant fossils. The conditions under the BLM classification system are as follows:

- Condition 1 - Areas or formations that are known to contain vertebrate fossils or noteworthy occurrences of invertebrate or plant fossils.
- Condition 2 - Areas or formations with exposures of geological units or settings that have high potential to contain vertebrate fossils or noteworthy occurrences of invertebrate or plant fossils. The presence of geologic units from which such fossils have been recovered elsewhere may require further assessment of these units where they are exposed in the area of consideration.

- Condition 3 - Areas or formations that are very unlikely to produce vertebrate fossils or noteworthy occurrences of invertebrate or plant fossils based on their surficial geology, igneous or metamorphic rocks, extremely young alluvium, colluvium, or eolian deposits or the presence of deep soils. However, if possible it should be noted at what depth bedrock may be expected in order to determine if fossiliferous deposits may be uncovered during surface-disturbing activities.

There is one known fossil locality within the Project Area. The paleontological fossil taxa that may be found within the Project Area are typical of those found throughout the Uinta Formation, consisting of a diverse variety of primitive mammals, crocodiles, and turtles. Drainages in the Project Area (i.e., Saddletree Draw and Atchees Wash) expose strata of the Evacuation Creek and Parachute Creek members of the Green River Formation that have a high potential to yield fossil resources (Condition 2). The lower Wagonhound Member of the Uinta Formation forms the bedrock throughout the remainder of the Project Area and has been known to yield fossils resources (Condition 1) (Figure 7).

3.2.4 Water Resources

Hydrologic Setting

The Project Area is located in the southern portion of the Uinta Basin of northeastern Utah. The basin generally has short, warm summers and long, cold winters, especially at higher elevations. Average annual precipitation in the Project Area is between six and eight inches.

The Uinta Basin is drained by the Green River and its tributaries, including the White River. The White River drains the eastern portion of the Uinta Basin, including those portions of the basin within Colorado. The Project Area lies to the south of the White River and is drained by three ephemeral tributaries to the White River: Atchees Wash, Saddletree Draw, and an unnamed ephemeral tributary to the west of Saddletree Draw. Flow in these streams primarily occurs only following rain events and during spring runoff from snowmelt.

The topography of the Project Area is characterized by raised, sloping benches and ridges that are incised by a series of ephemeral draws and washes. These ephemeral washes flow into Atchees Wash, Saddletree Draw, and the unnamed ephemeral tributary and collect and convey runoff from upland areas in the Project Area to the White River located approximately one mile to the north. Sections of the White River near the Project Area possess a high width to depth ratio and a high sinuosity rating, meaning that the river is very wide in relation to its depth and exhibits substantial meandering.

Stream Classification

The Utah Water Quality Board classifies Utah surface water resources according to quality and degree of protection (UDEQ 2000). All streams and water bodies in Utah are assigned one or more classifications according to their intended beneficial uses. The White River and its tributaries from the confluence with the Green River to the Colorado state line are classified as 2B, 3B, and 4. Definitions for these classifications are as follows:

- Class 2B – Protected for primary contact recreation such as boating, swimming, or similar uses;
- Class 3B – Protected for warm water species of game fish and other warm water aquatic life, including the necessary aquatic organisms in their food chain; and,
- Class 4 – Protected for agricultural uses including irrigation of crops and stock watering.

Surface Water Flow

The USGS formerly maintained two surface water gauging stations on the White River in the vicinity of the Project Area. Neither of these stations were monitored for discharge beyond 1986, but these data are still useful for determining flow conditions for the White River. There are no flow data available for Atchees Wash, Saddletree Draw, or the unnamed stream in the western portion of the Project Area.

Table 3-2 presents summary flow data for the period of record for the two gauging stations. Mean monthly stream flow over the period of record for the White River at the gauging station at Asphalt Wash, upstream of the Project Area, is relatively steady between August and April, ranging from 295 cfs to 497 cfs. The White River is perennial with high flows occurring in spring responding to snowmelt in the mountains of Colorado. During May, June, and July, high flows ranging from about 1,000 cfs to 4,300 cfs often occur due to short duration, high intensity thunderstorms and contributions from snowmelt. Downstream of the Project Area, mean monthly stream flows in the White River near the confluence with the Green River at Ouray, Utah are larger during the fall through spring months, ranging from 383 cfs to 781 cfs. Flows increase during the summer and peak flows are about 1,000 cfs more than at the station at Asphalt Wash.

Table 3-2. Stream Flow Data for USGS Gauging Stations

USGS Gauging Station ID	Range of Monthly Mean Discharge (cfs)	Peak Daily Discharge (cfs)	Mean Annual Discharge (cfs)	Period of Record
White River at Asphalt Wash 09306700	295 (December) – 1,412 (June)	4,380 (June 10, 1975)	535	October 1974 – September 1977
White River at Mouth near Ouray, Utah 09306900	383 (January) – 2,392 (June)	5,550 (June 10, 1984)	822	April 1974 – September 1986

Source: <http://waterdata.usgs.gov/nwis>

Surface Water Quality

Water Quality Standards

The U.S. Environmental Protection Agency (EPA) has established primary and secondary drinking water standards (EPA 2003) for approximately 90 water contaminants as required by the Safe Drinking Water Act, as amended in 1996, and Clean Water Act (CWA) of 1987, as amended. These regulations specify maximum contaminant levels (MCLs) and secondary standards for specific contaminants. The MCLs are health-based. Although these MCLs legally apply only to public drinking water supplies, they are also useful as general indicators of water quality. The secondary standards are for constituents that cause cosmetic effects (such as skin or tooth discoloration) or esthetic effects (such as taste, odor, or color) in drinking water.

Project Area Surface Water Quality

Water quality data for Saddletree Draw and Atchees Wash are not available. However, surface water quality analyses were conducted by the USGS in conjunction with discharge measurements at the two USGS gauging stations on the White River described above. Table 3-3 provides a summary of the data collected at USGS station 09306700 on the White River at Asphalt Wash, upstream of the Project Area. For this station, samples for chemical analysis were collected from August 1974 to July 1978, and from April 1981 to August 1983. Waters in the White River are described as calcium-sodium bicarbonate-

sulfate type waters with moderate to very high hardness (140 – 400 mg/L as CaCO₃). Total dissolved solids (TDS) content is variable during the year, ranging from 222 mg/L to 892 mg/L, and averages 509 mg/L, slightly above the secondary standard of 500 mg/L. The waters are generally neutral to alkaline with pH ranging from 6.5 to 8.6 units. Specific conductance ranges from 320 to 1,650 uS/cm with an average of 752 uS/cm. These values are in the medium to high salinity classes as defined by the U.S. National Salinity Laboratory (1954). High salinity water is not suitable for irrigation use on soils with restricted drainage.

The maximum values of aluminum, iron and sulfate are above the secondary standards. In addition, concentrations of ammonia and copper exceeded the state of Utah aquatic standards once and twice, respectively. Total suspended solids (TSS) range from 46 mg/L to over 8,000 mg/L during high-intensity runoff events, and exceeded the aquatic standard of 90 mg/L for all but two measurements conducted during the period of record.

Table 3-3. Summary of Water Quality Analyses for White River at Asphalt Wash, USGS Gauging Station 09306700

Parameters	Standards		Summary Statistics		
	Drinking Water	Aquatic Biota ³	No. of Samples	Range	Mean
General Water Quality Indicators					
Temperature (°C)			108	0 – 23.5	8.93
Specific Conductance (uS/cm)			56	320 – 1,650	752
Dissolved Oxygen (mg/L)		Min 6.5	23	3.8 - 11.9	8.43
pH (standard units)	6.5-9.0 ²	6.5-9.0	42	6.5 - 8.6	8.02
Total Hardness (mg/L)			50	140 - 400	273
Total Dissolved Solids (mg/L)	500 ²	1,200	52	222 - 892	509
Total Suspended Solids (mg/L)		90	63	46 – 8,700	1,400
Ionic Constituents					
Calcium (mg/L)			52	36 - 83	66.4
Magnesium (mg/L)			52	11 - 48	26.0
Sodium (mg/L)			52	13 - 180	65.9
Potassium (mg/L)			52	1.1 - 6.1	2.3
Chloride (mg/L)	250 ²		52	5.8 - 230	37.7
Sulfate (mg/L)	250 ²		52	55 - 470	175
Fluoride (mg/L)	4 ¹ , 2 ²	1.2 - 2.4 ⁴	52	0.1 - 2	0.35
Ammonia (mg/L)		0.11 – 2.49 ⁴	51	<0.01 – 0.15	0.035
Silica (mg/L)			52	7.1 – 17	13.0
Bicarbonate (mg/L)			46	125 - 280	226
Nitrite & Nitrate (mg/L)	10 ¹	4	52	0.01 - 0.97	0.15
Trace Metals					
Aluminum (ug/L)	50 - 200 ²	750	39	<10 – 460	46.0
Arsenic (ug/L)	10 ¹	150	36	<1 – 4	1.24
Barium (ug/L)	2,000 ¹	1,000	32	<35 – 300	66.6
Boron (ug/L)			34	30 – 100	49.1

Parameters	Standards		Summary Statistics		
	Drinking Water	Aquatic Biota ³	No. of Samples	Range	Mean
Copper (ug/L)	1,300 ¹ , 1,000 ²	12 ⁵	6	<2 – 105	27.2
Iron (ug/L)	300 ²	1,000	36	<10 – 1,750	77.5
Manganese (ug/L)	50 ²		52	11 – 48	26.0
Selenium (ug/L)	50 ¹	5	30	0.5 – 3	1.17
Strontium (ug/L)			30	<60 – 1,300	760
Zinc (ug/L)	5,000 ²	120	18	10 – 210	33.3

All samples are dissolved (filtered) unless otherwise noted

Average values calculated using one-half the detection limit for non-detect values

Bold values exceed standards

¹Federal Drinking Quality Standards Primary Maximum Contaminant Level (MCL)

²Federal Drinking Quality Standards Secondary Maximum Contaminant Level (SMCL)

³Aquatic life (Utah Water Quality Standards, R317-2 Utah Administrative Code) EPA is in the process of revising the national criteria for aluminum for aquatic life and expects to complete this process in 2007.

⁴Value is dependant on temperature and pH

⁵Standard for hardness of 100 mg/L; exact value is dependant on water hardness

Source: <http://waterdata.usgs.gov/nwis>

Table 3-4 provides a summary of the data collected at USGS station 09306900 on the White River above the confluence with the Green River near Ouray, Utah, downstream of the Project Area. Compared to the upstream station, waters in the White River at this location contain slightly higher average concentrations of magnesium, sodium, sulfate, and bicarbonate. TDS concentrations are also slightly higher than upstream with an average of 541 mg/L. The maximum values of aluminum, iron and sulfate are above the secondary standards. In addition, the maximum concentrations of ammonia, selenium, and zinc exceed the state of Utah aquatic standards. TSS ranged from 3 mg/L to over 50,000 mg/L during high-intensity runoff events, and exceeded the aquatic standard of 90 mg/L for all but ten measurements conducted during the period of record. Sodium-adsorption ratio (SAR) was also reported for this station, and ranges from 0.7 to 6. Waters with SARs in the range of 0 to 6 can generally be used on all soils with little problem of a sodium buildup. With higher SAR values above 6, chances for soil permeability problems increase (Hergert et al. 1997).

Table 3-4. Summary of Water Quality Analyses for White River at Ouray, Utah, USGS Gauging Station 09306900

Parameters	Standards		Summary Statistics		
	Drinking Water	Aquatic Biota ³	No. of Samples	Range	Mean
General Water Quality Indicators					
Temperature (°C)			261	0 – 32	11.8
Specific Conductance (uS/cm)			167	330 – 1600	814
Dissolved Oxygen (mg/L)		Min 6.5	144	2.2 – 13.1	8.83
pH (standard units)	6.5-9.0 ²	6.5-9.0	150	7.1 – 8.8	8.18
Total Hardness (mg/L)			129	97 – 400	275
Total Dissolved Solids (mg/L)	500 ²	1,200	135	197 – 566	541
Total Suspended Solids (mg/L)		90	183	3 – 51,700	3,440
Sodium-Absorption Ratio			129	0.7 – 6	2.0

Parameters	Standards		Summary Statistics		
	Drinking Water	Aquatic Biota ³	No. of Samples	Range	Mean
Ionic Constituents					
Calcium (mg/L)			142	24 – 94	66.1
Magnesium (mg/L)			142	4.8 – 55	27.6
Sodium (mg/L)			142	18 – 230	75.4
Potassium (mg/L)			142	1.2 – 6.7	2.30
Chloride (mg/L)	250 ²		142	6.9 – 86	33.1
Sulfate (mg/L)	250 ²		142	51 – 570	197
Fluoride (mg/L)	4 ¹ , 2 ²	1.2 - 2.4 ⁴	126	0.1 – 1.2	0.31
Bicarbonate (mg/L)			97	132 – 400	242
Nitrite & Nitrate (mg/L)	10 ¹	4	77	0.01 – 0.8	0.18
Orthophosphate (mg/L)			57	<0.01 – 0.06	0.02
Ammonia (mg/L)		0.11 – 2.49 ⁴	73	<0.01 – 0.26	0.05
Silica (mg/L)			142	9.2 – 17	12.8
Trace Metals					
Aluminum (ug/L)	50 - 200 ²	750	60	<10 – 180	34.2
Arsenic (ug/L)	10 ¹	150	66	<1 – 5	1.78
Barium (ug/L)	2,000 ¹	1,000	53	50 – 400	88.2
Boron (ug/L)			86	<20 – 490	117
Total iron (ug/L)	300 ²	1,000	32	70 – 78,000	17,400
Iron (ug/L)	300 ²	1,000	107	<3 – 350	31.4
Manganese (ug/L)	50 ²		34	<1 – 20	6.21
Selenium (ug/L)	50 ¹	5	65	<1 – 8	1.71
Strontium (ug/L)			44	400 – 1200	859
Vanadium (ug/L)			40	0.9 – 9.4	2.49
Zinc (ug/L)	5,000 ²	120	46	<3 – 180	24.9

All samples are dissolved (filtered) unless otherwise noted

Average values calculated using one-half the detection limit for non-detect values

Bold values exceed standards

¹Federal Drinking Quality Standards Primary Maximum Contaminant Level (MCL)

²Federal Drinking Quality Standards Secondary Maximum Contaminant Level (SMCL)

³Aquatic life (Utah Water Quality Standards, R317-2 Utah Administrative Code). EPA is in the process of revising the national criteria for aluminum for aquatic life and expects to complete this process in 2007.

⁴Value is dependant on temperature and pH

Source: <http://waterdata.usgs.gov/nwis>

Groundwater

Shallow groundwater is present in the unconsolidated alluvial aquifers associated with the White River. Tertiary bedrock aquifers in the Project Area are found in the lower Uinta Formation, Parachute Creek Member of the Green River Formation (the “Birds Nest Aquifer), and Wasatch Formation. Total dissolved solid concentrations generally range from 500 to 3,000 mg/l within these aquifers in the Uinta Basin and can exceed 10,000 mg/l in some deeper parts of the Uinta Formation. The “Birds Nest Aquifer” is confined by the overlying Uinta Formation. Recharge of the aquifer occurs by leakage from the Uinta Formation and through infiltration to the aquifer. Low yields of non-potable groundwater can be obtained from both aquifers (BLM 2006).

3.2.5 Floodplains

Mapped 100-year floodplains in the Project Area exist along the White River, Atchees Wash and Saddletree Draw, and along the lower portion of the unnamed ephemeral tributary to the White River, as shown on Figures 2 through 5. These floodplains are generally located on benches above the current stream channels that were formed by deposition of sediment carried by runoff from the adjacent ridges and canyon walls during storm and snowmelt events.

Currently, 100-year floodplains are protected by Executive Order 11988 which requires that all Federal agencies take action to reduce the risk of flood loss; to minimize the impact of floods on human safety, health, and welfare; and to restore and preserve the natural and beneficial values served by floodplains. The most recent data available regarding 100-year floodplains in the Project Area, as shown on Figures 2 through 5, are from a 1977 U.S. Department of Housing and Urban Development (HUD) and Federal Emergency Management Agency (FEMA) survey, which inventoried public and State lands in Uintah County.

Due to topographical restraints, under the Alternative A - Proposed Action and Alternative B – Resource Protection Alternative, three new well pads would be constructed on or immediately adjacent to the 100-year floodplain of Atchees Wash. In addition, existing roads in Atchees Wash and Saddletree Draw would be realigned as described in Section 2.3.3. Two water pumping stations would also be installed near the mouth of Atchees Wash and Saddletree Draw within the White River 100-year floodplain as described in Section 2.3.10. Temporary water pipe would be placed along the 100-year floodplains in Atchees Wash and Saddletree Draw during the construction phase of the project to deliver water from these pumping stations to holding tanks. These pipes and pumping stations would be removed after construction of the project facilities has been completed.

Due to topographical restraints, under Alternative C – Leasing and Development with Restricted Surface Use, three new well pads would be installed constructed on or immediately adjacent to Atchees Wash, and existing roads in Atchees Wash and Saddletree Draw would be realigned as described in Section 2.3.3. In addition, a gas pipeline would be installed adjacent to the realigned road in Saddletree Draw and the existing road in the upper portion of the drainage would be improved. One water pumping station and temporary water pipes would also be installed as described above.

For Alternative D - No Action, surface disturbing activities would not take place on or adjacent to floodplains, and the pumping stations and temporary water pipes would not be installed.

3.2.6 Wetlands/Riparian Zones

Wetlands are generally defined as those areas that are inundated or saturated with water at or near the surface of the soil for a sufficient duration during the growing season to develop characteristic soils and vegetation. Principle species of wetlands in the Uinta Basin include cattail (*Typha latifolia*), bullrush (*Scirpus spp.*) and sedge (*Carex spp.*).

Riparian areas are a form of wetland transition between saturated wetlands and upland areas. They are defined as an area of land directly influenced by permanent (surface or sub-surface) water. Principle woody riparian species within the Uinta Basin include willow (*Salix spp.*), narrowleaf cottonwood (*Populus augustifolia*), and Salt Cedar (*Tamarix pentandra*).

Wetlands and riparian zones located in the Project Area typically only occur along the White River and in portions of the White River 100-year floodplain that are seasonally inundated with water. No proposed well pads or road upgrades would occur within these habitats. It should be noted however, that under Alternatives A, B, and C, portions of the water pump system including the sump and a small section of water pipe would be located in the riparian habitats along the White River.

3.2.7 Invasive and Noxious Species

Undesirable, weedy, herbaceous species occur to varying degrees within disturbed areas throughout the Project Area. Noxious weeds listed by the State of Utah that could potentially occur in the Project Area include Canada thistle (*Cirsium arvense*), field bindweed (*Convolvulus arvensis*), hoary cress (*Cardaria drabe*), Russian knapweed (*Centaurea repens*), and perennial pepperweed (*Lepidium latifolium*). Salt cedar (*Tamarix ramosissima*) is a Uintah County listed noxious weed that occurs in the Project Area along Saddletree Draw, Atchees Wash and the White River. Occurrences of Canada thistle, Russian knapweed, field bindweed, and hoary cress are in the Project Area and are generally associated with existing well pads and roads. Vehicles and construction equipment are the primary vectors for the seed of these species entering the area.

Russian thistle (*Salsola iberica*), halogeton (*Halogeton glomeratus*), and cheatgrass (*Bromus tectorum*) are the primary invasive annual species that dominate disturbed areas in the Project Area. Russian thistle and halogeton are less aggressive and are generally out-competed by perennial native species. Cheatgrass is a much stronger competitor that is difficult to control once it becomes established. Such species are introduced primarily by disturbances from vehicles, animals, or wind.

3.2.8 Recreation

The Project Area is located on public lands administered by the BLM, as well as two sections of State lands and scattered private parcels. The BLM-administered portions of the Project Area are part of the Book Cliffs Extensive Recreation Management Area (ERMA), which is managed to provide unstructured recreation opportunities for a diversity of uses (BLM 1985). Although the existing network of roads and trails provides ample access to and throughout the area for recreational users, use of the area for recreational pursuits is limited. Existing oil and gas development, county and project roads, pipelines, and other facilities concentrated within the two state parcels (T10S, R23E, Section 32 and T10S, R22E, Section 36), as well as existing human activity and development on public lands, detracts from the recreational experience of those visitors seeking a pristine setting. Section 3.2.14 contains a more detailed discussion of opportunities for primitive and unconfined recreational opportunities. The balance of the ERMA, however, is available for recreation of a more undeveloped nature.

Recreational use of the Project Area is primarily of a dispersed nature including activities such as hiking, off-highway driving, sight-seeing, and hunting. Hunting is limited to rabbit, coyote, mountain lion, mule deer, and elk, and occurs generally in the fall and winter months. Because of the open nature of the terrain, and the existing road network, the Project Area has ample opportunities for unrestricted Off-Highway Vehicle (OHV) use. The Project Area is currently managed as open to OHV use, with the exception of a ¼-mile buffer of the White River, which is closed to OHV use. The "open" designation allows for cross-country OHV travel not restricted to existing roads and trails. However, OHV use occurring in the area is low and is primarily associated with hunting.

The majority of recreational use in the general project vicinity is associated with the White River. An established two-mile hiking trail (Goblin City Trail) within the White River Canyon area provides access from the Atchees Wash boater's camp site on the White River to a ridge that overlooks a series of stacked ridges, towers, and spires, known as Goblin City. The Goblin City overlook is located in Section 29,

T10S, R23E in the Project Area and provides a 360-degree vantage point from which recreationists can view the surrounding landscape. There are no other established hiking trails in the area. The BLM expects use of the Goblin City View Area, which had approximately 120 visitors in 2003, to remain static or to slightly decrease over the next several years. A new trailhead and increased accessibility may lead to a slight increase in visitation to the overlook, however visitors will likely not exceed 200 per year in the foreseeable future (K. Bartell, personal communication). Off trail hiking in the Project Area is estimate to be extremely low.

Currently there are two commercial rafting/boating outfitters providing tours on the White River through the area. An estimated 2,000 people per year float the White River through the section that offers access to the Goblin City View Area. Use of the river for recreational purposes is dependant upon spring runoff and flow and is generally limited to mid-April through June, with June being the month of highest use. In general, these outfitters do not make use of the Project Area other than the segment adjacent to the White River, and occasionally, a stop at the Atchees Wash campsite. Of value to recreationists floating the White River Canyon are views of the surrounding landscape within a radius of approximately five miles from the view area.

3.2.9 Livestock Grazing

The Project Area contains portions of one grazing allotment (the Olsen Allotment). This allotment is annually grazed by sheep from November to mid-June.

An animal unit month (AUM) is defined as the amount of forage needed to feed five sheep for one month. There are approximately 4,826 acres of BLM land allotted for grazing in the Project Area. However, only 2,113 of these acres are deemed suitable for grazing (i.e. <40% slope). Within this area there are approximately 192 AUMs. No range improvements have occurred within the Project Area (BLM 2007).

Table 3-5 Grazing Allotments in the Rock House Project Area

Allotment Name	Type	Total Allotment Acres	Total Allotment AUMs	Acres per AUM	Usable Acres within Project Area	Usable AUMs within Project Area
Olsen AMP Allotment	Sheep	134,307	12,144	11	2,113	192

3.2.10 Soils

Soil mapping of the Project Area has been completed and published by the USDA-NRCS (2003). The proposed Project Area is covered by eight soil types. Descriptions of each soil type and the facilities that would be located on each are described below.

Badland-Rock Outcrop Complex (Map Unit 12)

This soil type occurs on widely varying slopes of 1 to 100%, and covers upland areas of the Project Area on ridge tops and hills between the ephemeral drainages. Badlands consist of highly dissected areas of soft shale and sandstone with numerous intermittent drainage channels. Runoff is very high and erosion is active on these surfaces. The proposed co-located pipeline and water line that would serve Lease UTU-81737 under Alternatives A-C would be located on this soil type. Under Alternative D, no surface disturbing activities would occur on this soil type.

Badland/Walknolls/Rock Outcrop Complex (Map Unit 14)

This soil type occurs on slopes of 50-90% on ridges and hills adjacent to Atchees Wash, the lower portion of Saddletree Draw, and in the western portion of the Project Area. The runoff is high to very high and erosion is active. Under Alternatives A and B, four well pads and portions of proposed co-located access roads and pipelines would be located on this soil type. Under Alternative C, three well pads, roads, and pipelines would be constructed on this soil type. Under Alternative D, no surface disturbing activities would occur on this soil type.

Gilston Sandy Loam (Map Unit 78)

This soil type occurs on gentle slopes of 2-8% on the floors of the upper portions of Atchees Wash and Saddletree Draw. Runoff speed is slow and the erosion potential is slight for these soils. The soils are moderately saline and strongly sodic, which could make reclamation difficult.

Under Alternatives A-C, three well pads would be constructed in Atchees Wash on this soil type. In addition, the majority of the realigned roads and co-located pipelines in Atchees Wash would also be on this soil type. No construction would occur on this soil type under Alternative D (No Action).

Gilston-Chalkcliff association (Map Unit 79)

This soil type occurs on slopes of 2-25% near the confluence of Saddletree Draw and the White River. Runoff speed is slow and the erosion potential is slight for these soils. The soils are moderately saline and strongly sodic, which could make reclamation difficult.

Under Alternatives A-C, the temporary water line to the water pump would be placed on this soil type. No surface disturbance would occur on this soil type under any of the alternatives.

Green River-Fluvaquents complex (Map Unit 90)

This soil type occurs on slopes of 0-2% on the floodplain of the White River. Runoff speed is very slow and the erosion potential is slight for these soils. The soils are non-saline and non-sodic.

No project facilities would be located on this soil type under any of the alternatives.

Pherson-Hickerson Complex (Map Unit 179)

This soil complex occurs on slopes of 2-8% on the floors of the lower portions of Atchees Wash, Saddletree Draw, and the unnamed ephemeral drainage west of Saddletree Draw. Runoff is slow to medium and erosion potential is slight to moderate. These soils are moderately sodic, which could inhibit successful reclamation. A short section of proposed road (and co-located pipeline for Alternatives C) near the mouth of Saddletree Draw would be located on these soils under all alternatives.

Walknolls Extremely Channery Sandy Loam-Gilston Association (Map Unit 257)

This soil unit occurs on slopes of 2-50% on hillslopes and ridge tops, and covers large portions of the Project Area between the major ephemeral drainages. Runoff speed is slow to high, depending on slope, and the erosion potential ranges from slight to high. The majority of the proposed facilities, including up to nine well pads and associated roads and pipelines, would be constructed on this soil type for Alternatives A-C. For Alternative D, two well pads would be expanded on this soil type.

Walknolls-Uendal Association (Map Unit 266)

This soil unit occurs on small areas near the southwest corner of the Project Area on slopes of 2-25% on hillslopes. Runoff speed and erosion potential are high. No proposed facilities would be located on this soil type under any of the alternatives.

3.2.11 Threatened, Endangered, and Sensitive Animal Species and other Wildlife

Threatened, Endangered, and Sensitive Animal Species

This section discusses species that have a Federal and/or State special-status designations. This includes the following:

- Species listed as threatened or endangered, proposed for listing as threatened or endangered, or considered a candidate for listing as threatened or endangered under the Endangered Species Act (ESA)
- Species listed as threatened or endangered or sensitive in the State of Utah by the UDWR.

Section 7(a) of the Endangered Species Act (ESA) requires Federal agencies to evaluate their actions with respect to any species that is proposed or listed as endangered or threatened and with respect to its critical habitat, if any has been designated. Regulations implementing this interagency cooperation provision of the ESA are codified at 50 CFR 402. Section 7(a)(2) requires Federal agencies to ensure that activities they authorize, fund, or carry out are not likely to adversely affect or jeopardize the continued existence of a Federally listed species or result in the adverse modification or destruction of its critical habitat. If the action “*may affect, is likely to adversely affect*” a Federally listed species or its critical habitat, the responsible Federal agency must enter into formal consultation with the USFWS. It is the BLM’s current policy that USFWS candidate and State listed species also be managed to prevent future Federal listing as threatened or endangered.

Numerous Federally listed and Utah State sensitive species have the potential to occur with the Rock House Project Area. A brief description of each of these species is presented below as well as in Appendix E. Appendix E also briefly discusses special status wildlife species that were considered but eliminated from detailed analysis in this EA.

Bald Eagle (*Haliaeetus leucocephalus*)

Under the authority of the ESA of 1973, as amended, the USFWS delisted the bald eagle in the lower 48 States from the Federal list of endangered and threatened wildlife, effective August 8, 2007 (72 FR 37346). However, the bald eagle is still protected under the Bald and Golden Eagle Protection Act (BGEPA) and the Migratory Bird Treaty Act (MBTA). In addition, the USFWS, in cooperation with the States and in compliance with Section 4(g)(1) of the ESA, will monitor the status of the bald eagle over a 20-year period with sampling events held once every five years (USFWS Bald Eagle Monitoring Team 2007). The result of the post-delisting monitoring plan will be to determine if the population of bald eagles in the lower 48 States warrants expanded monitoring, additional research, and/or resumption of Federal protection under the ESA (USFWS Bald Eagle Monitoring Team 2007).

Bald eagles are typically found near open water, but will hunt on desert uplands and scavenge for carrion miles from water. Bald eagles generally arrive in the Uinta Basin in early to mid-November where they can be observed actively hunting over open water, primarily for fish and waterfowl. Wintering bald eagles have been observed roosting in mature cottonwoods along the White River during winter months, usually from early November through late March. The closest historic bald eagle roosting site is located

approximately 20 miles west of the Project Area along the Green River (BLM 2006). Given the similarity of vegetation and proximity of the Project Area to the White River, bald eagles could potentially establish roosting sites north of the Project Area and/or forage on carrion and small mammals within upland habitats of the Project Area from early November through late March.

Mexican Spotted Owl (*Strix occidentalis lucida*)

The Mexican spotted owl (MSO) is a Federal and State listed threatened species. At the northern end of their range, which includes the State of Utah, the MSO is a year-round resident of narrow, shady cool canyons between 4,400 - 6,800 feet in elevation. Most of the owl's activities during the breeding season are believed to occur within the canyons. Owls roost in riparian vegetation of canyon bottoms, on ledges, or cavities in the slickrock canyon. Habitats suitable for Mexican spotted owl nesting appear to be more restricted than those required for foraging or roosting. Areas with high canopy closure and at least a few old-growth trees are usually selected for nesting (USFWS 1995). Canyon habitats used for nesting and roosting are typically characterized by the cooler conditions found in steep, narrow canyons, often containing crevices, ledges, and/or caves. These canyons frequently contain small clumps or stringers of ponderosa pine, Douglas-fir, white fir, and pinyon/juniper. Deciduous riparian and upland tree species may also be present. One common characteristic among the canyon sites is the presence of steep to vertical rock walls in all or part of the canyon. Rock-walled canyons preferred by the owls are generally found at elevations below 7,000 feet to as low as 3,750 feet (Ganey and Balda 1989).

There is no designated critical habitat for the MSO on the land administered by the VFO. The Diamond Mountain and Book Cliffs planning areas have been identified as containing suitable MSO habitat according to the USFWS 1997 and 2000 models. The majority of the modeled MSO habitats in the VFO area were further evaluated by computer models or ground-truthed between 2003 and 2005. According to these analyses, portions of the Project Area were considered potential MSO habitat (SWCA 2005). In the summer of 2006, four MSO surveys were conducted in all potential nesting habitat in the Project Area. No Mexican spotted owls were observed during these surveys (B&A 2006). Upon further examination of these habitats by the BLM and USFWS in the fall of 2006, it was determined that no habitats in the or around the Project Area possessed the primary constituent elements necessary to support nesting Mexican spotted owls. As such, no additional MSO surveys are required in the Project Area.

Greater Sage-grouse (*Centrocercus urophasianus*)

The greater sage-grouse is a Utah State sensitive species. Greater sage-grouse are closely allied with the large, woody sagebrushes of western North America and depend on these for food and cover during all periods of the year. Due to sage-grouse dependence on sagebrush habitats they are considered a sagebrush obligate. Sagebrush habitats across the range of sage-grouse may vary considerably, and the specific habitat components used by the species can vary due to biotic and abiotic factors. Large, woody species of sagebrush including big sagebrush, silver sagebrush, and threetip sagebrush (*A. tripartita*) are used by sage-grouse throughout the year in all seasonal habitats. Other species of sagebrush such as low sagebrush (*A. arbuscula*) and black sagebrush (*A. nova*) provide important seasonal habitat components during spring and winter. Summer habitats used by sage-grouse include riparian and upland meadows and sagebrush grasslands. Sage-grouse have also been documented using a variety of human-modified habitats, such as irrigated and non-irrigated croplands and pasturelands. Disturbed areas such as roads, plowed fields, gravel pits, and stock ponds have been used as lek sites. The value of these modified habitats to sage-grouse depends upon the usefulness of the habitat and the juxtaposition of the modified habitat in relationship to adjacent sagebrush habitats (Connelly et al. 2004). Sagebrush dominated shrublands occur within the Project Area, primarily in the valley bottoms of Saddletree Draw and Atchees Wash.

Leks are traditional courtship display and mating areas attended by sage-grouse in or adjacent to sagebrush dominated nesting habitat. Leks are situated in relatively open areas with less herbaceous and shrub cover than surrounding areas. Leks may be natural openings within sagebrush communities or openings created by human disturbances, including dry stream channels, edges of stock ponds, ridges, grassy meadows, burned areas, gravel pits, sheep bedding grounds, plowed fields, and roads (Connelly et al. 2004). According to the UDWR and BLM data, no leks occur within two miles of the Project Area.

Sage-grouse nesting habitat is often a broad area within or adjacent to winter range or between winter and summer range. Productive nesting habitat includes sagebrush with horizontal and vertical structural diversity. The understory of productive nesting habitat typically includes native grasses and forbs that provide a food source of insects, concealment of the nest and hen, and herbaceous forage for breeding and nesting hens (Connelly et al. 2004). Typically, most hens nest within 3.2 kilometers (km) of a lek (Braun et al. 1977). According to UDWR and BLM data, no sage-grouse nests occur within the Project Area.

Early brood-rearing habitat generally occurs relatively close to nest sites, but movements of individual broods may be highly variable. Early brood-rearing habitats may be relatively open stands of sagebrush when compared to optimum nesting habitat. High plant species richness with abundant forbs and insects characterize brood areas. Insects, especially ants and beetles, are an important food component of early brood-rearing habitat. As herbaceous plants mature and dry, hens usually move their broods to more mesic sites. Sage-grouse broods occupy a variety of habitats during summer including sagebrush, relatively small burned areas within sagebrush, wet meadows, farmland, and other irrigated areas adjacent to sagebrush habitats (Connelly et al. 2004). Brooding habitat primarily occurs along the sagebrush dominated valleys of Saddletree Draw and Atchees Wash. Despite the presence of some brooding habitat in the Project Area, sage-grouse have not been documented utilizing these brooding habitats.

Humpback Chub (*Gila cypha*)

The humpback chub is a Federal and State endangered species. Of the five self-sustaining populations of the humpback chub in the upper Colorado River basin, three of them occur in Utah. They are located in Westwater Canyon on the Colorado River, Desolation/Gray Canyon on the Green River, and Cataract Canyon on the Colorado River (USFWS 2002a). Each of these populations consists of a discrete reproducing group of fish, with independent stock-recruitment dynamics and is geographically separated from other populations (USFWS 2002a). Potential habitat for this species does occur in the White River immediately adjacent to the Project Area, however as known populations and stocking areas are geographically separated from these habitats, the species is not likely to be found in these areas. No critical habitat for the humpback chub was identified within the Project Area, however designated critical habitat does occur twelve miles downstream in the Green River.

Bonytail Chub (*Gila elegans*)

The bonytail chub is a Federal and State endangered species. There are currently no self-sustaining populations of bonytail in the wild, and very few individuals have been caught throughout the upper Colorado River Basin in Utah. A few individuals have been caught in the Green River in Hideout Canyon and Gray Canyon, at the confluence of the Colorado River and Green River, in the Colorado River at Cataract Canyon (USFWS 2002b), and in the White River (A. Torres, personal communication, July 2006). Releases of hatchery-reared bonytail into the upper basin have resulted in low survival, with no evidence of reproduction or recruitment (USFWS 2002b). Potential habitat for this species does occur in eddies, pools, and backwaters of the White River immediately adjacent to the Project Area. No critical habitat for the bonytail chub was identified within the Project Area, however designated critical habitat does occur twelve miles downstream in the Green River.

Razorback Sucker (*Xyrauchen texanus*)

The razorback sucker is a Federal and State endangered species. In the upper Colorado River basin in Utah, the razorback sucker is currently found in the Green River, upper Colorado River, and San Juan River sub-basins (USFWS 2002c). The fish are mostly aged adults with little or no recruitment, except in the middle Green River, where small numbers of juveniles and young adults indicate low recruitment levels. The largest population of razorback sucker in the upper Colorado River basin in Utah exists in low-gradient, flat-water reaches of the middle Green River between the Duchesne River and Yampa River. Known spawning sites in Utah are in the Green River near Escalante Ranch between river kilometer 492 and 501 (distance upstream from the Colorado River confluence) and at the confluence of the Green and Yampa Rivers in Dinosaur National Monument. The middle Green River population is estimated to be less than 100 adults (USFWS 2002c). In recent years only a few individual razorback sucker have been captured in the lower Green River; small numbers of larvae and juveniles indicate probable spawning in the vicinity of the San Rafael River confluence (USFWS 2002c).

The razorback sucker prefers slow backwater habitats and impoundments along the Colorado River system. Potential habitat for this species does occur in the White River immediately adjacent to the Project Area, and floodplain habitats of the White River in the Project Area also provide backwater refuges for these species when these areas are seasonally inundated. A total of 1,107 river km (688 river mi) in Utah has been designated as critical habitat for the razorback sucker. The 100-year floodplain habitat along the White River is designated critical habitat.

Colorado Pikeminnow (*Ptychocheilus lucius*)

The Colorado pikeminnow is a Federal and State endangered species. Three wild populations of Colorado pikeminnow are found in the Green River, upper Colorado River, and the San Juan River sub basins in Utah (USFWS 2002d). Occupied habitat of the Colorado pikeminnow in Utah occurs in the Green River from Lodore Canyon to the confluence of the Colorado River, the White River downstream of Taylor Draw Dam and Kenny Reservoir, the lower 143 km of the Price River, the lower Duchesne River, and the lower 2 km of the Dolores River (USFWS 2002d). Natural reproduction of Colorado pikeminnow in Utah is currently known from the Green and San Juan Rivers.

Capture-recapture sampling conducted in sections of the Green River Basin from 2000 to 2003 suggested a decline in abundance of Colorado pikeminnow [2000 = 3,180 individuals (3,030 adults, 150 recruits); 2003 = 2,426 individuals (2,142 adults, 284 recruits)] (Bestgen et al. 2005). Based on the trend in annual point estimates, reductions were most severe in the middle Green River and the White River. Those reaches supported the highest number of Colorado pikeminnow in the Green River Basin. Decreases in populations were attributed to lower survival and recruitment rates in these areas (Bestgen et al. 2005).

Adult Colorado pikeminnow prefer medium to large rivers, where they can be found in habitats ranging from deep turbid rapids to flooded lowlands. Young of the species prefer slow-moving backwaters. Potential habitat for this species does occur in the White River immediately adjacent to the Project Area, and floodplain habitats of the White River in the Project Area also provide backwater refuges for these species when these areas are seasonally inundated. A total of 1,168 river km (726 river mi) in Utah has been designated as critical habitat for the Colorado pikeminnow. The 100-year floodplain habitat along the White River is designated critical habitat (USFWS 1994).

Flannelmouth Sucker (*Catostomus latipinnis*)

The flannelmouth sucker is a Utah State Sensitive Species found in the Upper Colorado River Basin. Flannelmouth suckers typically inhabit deep water habitats of large rivers, but are also found in small

streams and occasionally in lakes. Flannelmouth typically spawn during March and April in the southern portions of Utah and from May to June in the North and higher elevations. Fecundity of females is proportional to fish size and varies with environmental conditions (UDWR 2006).

Extant flannelmouth sucker populations include the Green River from the Colorado River confluence upstream to Flaming Gorge Reservoir, and the White River from the Green River confluence to Kenny Reservoir, Colorado. Recent investigations of historical accounts, museum specimens, and comparison with recent observations indicate that flannelmouth suckers occupy approximately 50% of their historic range in the Upper Colorado River Basin (Utah, Wyoming, Colorado, and New Mexico). Habitat occurs within the White River (UDWR 2006).

Bluehead Sucker (*Catostomus discobolus*)

The bluehead sucker is a Utah State sensitive species found in the Upper Colorado River Basin. Bluehead suckers occur in small to large streams and rivers and tributaries in the Upper and Lower Colorado River Basin and in the Weber and Bear River drainages in the Bonneville basin. Large adult bluehead may inhabit stream environments as deep as two to three meters, although they most commonly feed in riffles and swift runs. Life expectancy is typically six to eight years. Spawning occurs in spring and early summer at lower elevations and mid- to late summer in higher, colder waters. Spawning occurs on gravel beds in shallow water (UDWR 2006).

Bluehead suckers historically occurred in the Colorado River Basin above the mouth of the Grand Canyon in mainstream and tributary habitats. In Utah, bluehead suckers continue to be found in mainstream rivers and tributary streams above Glen Canyon Dam to headwater reaches of the Green and Colorado rivers. Populations currently occur in the mainstream Green River from the Colorado River confluence upstream to Lodore, Colorado, and in the White River from the Green River confluence upstream to Meeker, Colorado. In the upper Colorado River Basin (Utah, Wyoming, Colorado, and New Mexico), bluehead suckers currently occupy approximately 45 percent of their historical habitat. Recent declines of the species have occurred in the White River below Taylor Draw Dam, and in the upper Green River. Habitat occurs within the White River (UDWR 2006).

Roundtail Chub (*Gila robusta*)

The roundtail chub is Utah State threatened species that is found in the Upper Colorado River Basin. This species is a large member of the minnow family found most often in major rivers and smaller tributary streams. Although movement patterns are poorly understood, the roundtail chub has been described as sedentary and mobile, depending on life stage and habitat conditions. Roundtail chubs typically mature from ages three to five, and fecundity varies with fish from as low as 1,000 eggs to over 40,000 eggs per female (UDWR 2006).

Extant roundtail chub populations include the Green River from the Colorado River confluence upstream to Echo Park and in the White River from the Green River confluence upstream to near Meeker, Colorado. The roundtail chub now occupies approximately 45 percent of its historical range in the Colorado River Basin. In the Upper Colorado River Basin (New Mexico, Utah, Colorado and Wyoming), it has been extirpated from approximately 45 percent of its historical range, including the Price River and portions of the San Juan, Gunnison and Green rivers. Data on smaller tributary systems are largely unavailable, and population abundance estimates are available only for short, isolated river reaches. Habitat occurs within the White River (UDWR 2006).

General Wildlife

The Project Area provides habitat for big game, small game, and raptors. Big game species that are likely to occasionally use the Project Area include mule deer (*Odocoileus hemionus*), pronghorn (*Antilocapra americana*), and elk (*Cervus canadensis*). The UDWR considers the majority of the area to be limited value mule deer habitat. No crucial big game ranges were identified within the Project Area.

Raptors likely to be present in the Project Area include golden eagles (*Aquila chrysaetos*) and prairie falcons (*Falco mexicanus*). Field surveys were conducted in the area in May 2006. One inactive raptor nest was documented in the immediate Project Area, and one active golden eagle nest was documented along Saddletree Draw less than ½ mile from the southern boundary.

Other wildlife species that are likely to occur in the Project Area include desert cottontail (*Sylvilagus audubonii*), black-tailed and white-tailed jackrabbit (*Lepus californicus* and *Lepus townsendii*), coyote (*Canis latrans*), gray fox (*Urocyon cinereoargenteus*), striped and spotted skunk (*Mephitis mephitis* and *Spilogale gracilis*), mountain lion (*Felis concolor*), bobcat (*Lynx rufus*), and various species of rodents.

Migratory Birds

The Migratory Bird Treaty Act (MBTA) as amended was implemented for the protection of migratory birds. Executive Order 13186 sets forth the responsibilities of Federal agencies to further implement the provisions of the MBTA by integrating bird conservation principles and practices into agency activities and by ensuring that Federal actions evaluate the effects of actions and agency plans on migratory birds.

Numerous bird species may migrate through, or nest within the Project Area. Avian species commonly associated with desert shrubs, grasslands, and scattered pinyon juniper communities within the Project Area include horned lark, sage sparrow, Brewer's sparrow, western kingbird, gray flycatcher, juniper titmouse, pinyon jay, prairie falcon, and American kestrel.

3.2.12 Vegetation including Special Status Plants

The Project Area is dominated primarily by Utah juniper and pinyon pine (PJ) intermingled with mixed cool desert shrubs, such as Wyoming big sagebrush, black sagebrush, and shadscale. Other sub-dominant shrubs include black greasewood, four-wing saltbush, Gardner's saltbush, ephedra, spiny hopsage, spiny horsebrush, birch leaf mountain mahogany, antelope bitterbrush, mountain big sagebrush, and rabbitbrush. Other brush and forb species such as euphorbia, American kochia, prickly pear, snakeweed, winter fat, and various buckwheat species also exist in the Project Area. Grasses that can be found in the vegetation communities include Indian rice, galleta, needle and thread, bottle brush squirrel tail, beardless bluebunch wheatgrass, western wheatgrass, Salina wild rye, blue grama, and cheatgrass.

Graham's Penstemon (*Penstemon grahamii*)

Graham's penstemon was removed from the USFWS list of candidate species in December 2006. It is endemic to the Uinta Basin and grows on semi-barren knolls, ridges, and steep slopes in a mix of fragmented white shale and silty clay soils of the Green River Formation. It grows in sparsely vegetated communities of pinyon-juniper, desert shrub, and Salina wildrye, at elevations ranging from 1,430 to 2,060 meters. The plant itself is a perennial herb that reaches 5-20 centimeters tall, has thick leathery leaves and large tubular, lavender colored flowers that bloom between May and June (UDWR 2006). Habitat for the Graham's penstemon is present in the Project Area on exposures of the Green River formation located along Atchees Wash (B&A 2005).

White River Beardtongue (*Penstemon scariosus albifluvis*)

White River beardtongue is a Federal candidate for listing as threatened or endangered that occurs in Duchesne and Uintah counties, Utah, as well as in immediately adjacent Rio Blanco County, Colorado. A member of the figwort family, this species is a perennial herb that is 15-50 cm tall, with lavender to pale blue flowers that bloom from late May to June. White River beardtongue is found on semi-barren areas on white soils that are xeric, shallow, fine textured, and usually mixed with fragmented shale. The species is primarily found in pinyon-juniper, desert shrub, and mixed desert shrub communities, at elevations ranging from 1,524 to 2,036 meters. Habitat for the White River beardtongue is present in the Project Area on exposures of the Green River formation located along Atchees Wash (B&A 2005).

Uinta Basin Hookless Cactus (*Sclerocactus wetlandicus*)

The Uinta Basin hookless cactus' (federally listed as threatened) unhooked large central spine differentiates it from other members of the *Sclerocactus* genus, which have either a hooked large central spine or none (USFWS 1990). However, at least a few individuals in most Uinta Basin hookless cactus populations possess moderately to strongly hooked spines (Goodrich and Neese 1986). The Uinta Basin hookless cactus is a desired species among cactus collectors because of its "beautiful purplish-red flowers" (USFWS 1979). Illegal collection of this cactus is the primary threat to the conservation and recovery of the species.

Habitat for the Uinta Basin hookless cactus generally consists of gravelly or rocky surfaces on river terrace deposits and lower mesa slopes (USFWS 1990), as well as gravel littered draws (Goodrich and Neese 1986), that are underlain by clay or silty clay. More recently this species has also been found on the Green River formation in the Basin. This species does not grow in sandy soils. The species occurs on varying exposures, but is more abundant on south-facing exposures, slopes to about 30 percent grade, and where terrace deposits break from level tops to steeper side slopes. The Uinta Basin hookless cactus is found at elevations from 5,000 to 5,600 feet above mean sea level (amsl) within the desert shrub vegetation community (USFWS 1990). Habitat for the Uinta Basin hookless cactus may occur in the Rock House Project Area along the river terrace slopes of the White River and as well along Atchees Wash.

3.2.13 Visual Resources

Public lands managed by the BLM within and surrounding the Project Area have been classified according to BLM's Visual Resource Management (VRM) system, an analytical process used to inventory, manage, and set management objectives for visual resources on public lands.

The majority of the Project Area occurs within a Visual Resource Management (VRM) Class IV area, which allows for changes in the landscape's original composition and character that may dominate the viewshed. The northern portion of the Project Area, nearest to the White River, is classified as a VRM Class II area, which allows for management activities to be seen, but those activities should not attract the attention of a casual viewer.

The Rock House Project Area is affected by substantial, on-going oil and gas activity. As such, numerous well pads, ancillary facilities, access roads, and surface pipelines have modified the natural character of Project Area on both Federal and State lands. Currently, there are twenty two active gas wells, one shut in well, over eight miles of road, and approximately six miles of pipeline that fall within the Project Area. An additional three miles of road along Saddletree Draw and Atchee Wash lead from the Project Area to the White River and are currently being used for existing development in the area.

Given the viewer sensitivity of recreationists on both the White River and the Goblin City Overlook and trail, viewshed analyses have been completed for these areas to determine the extent lands which can be seen by the casual observer (Figures 7 & 8).

3.2.14 Wild and Scenic Rivers

The Book Cliffs RMP did not recommend a wild and scenic river segment within the Project Area. However, the Vernal FO Draft RMP has proposed 28 BLM-administered miles of the White River and ¼ mile to either side of the White River as a Wild and Scenic River due to its scenic, recreational, historic, and wildlife values (Figure 6). The White River is a favorite canoeing destination and travels through a variety of geologic landforms including sandstone cliffs, sloping terraces, buttes, pinnacles, and eroded towers, which add visual interest in the varied shapes and textures present. The White River also provides critical habitat for the endangered Colorado River Squaw Fish as well as other threatened, endangered, or sensitive fish species. Threatened, endangered, or sensitive animal species in the river corridor include the yellow-billed cuckoo, peregrine falcon, and the bald eagle. Finally, the White River is the site of many historic events. Chronicles of early explorers describe the unique topography of the River.

The eligible segment of the White River (segment 2), which lies due north of the Project Area, has been tentatively classified as “wild”. However, this tentative “wild” area currently includes approximately four miles of roads which are on the Uintah County Transportation Plan. The Saddletree Draw and Atchees Wash roads currently intersect and end at the river, while the Asphalt Wash road runs along the river for approximately 0.9 miles. The existing roads in both Atchees Wash and Saddletree Draw are bladed and are currently are being used for water extraction as well as for access to existing oil and gas development on State lands.

A final suitability determination for this segment of river has not been completed. Until the ROD for the Vernal FO RMP is signed, which will determine suitability, protection of this portion of the White River would involve case-by-case review and mitigation of any actions proposed that might affect its eligibility as a Wild and Scenic River. The existing leases within the river corridor are pre-existing rights which include the right to develop those leases, including construction of off-lease roads and other key infrastructure necessary to provide reasonable access to development.

3.2.15 Wilderness Characteristics

While no Wilderness Study Areas (WSA) exist within the Rock House Project Area, the area does occur within an area that has been identified by the BLM Vernal FO as non-WSA lands with wilderness characteristics.

In an effort to determine which areas of the White River Wilderness Inventory Area (WIA) contained wilderness characteristics, the BLM Vernal FO interdisciplinary team (February 2007) reviewed the *1979 White River Wilderness Intensive Inventory Evaluation Report*, the *1999 BLM White River Wilderness Inventory Area*, supplemental information on the White River area provided by the Southern Utah Wilderness Alliance (SUWA) and the Utah Wilderness Coalition (UWC), and the *2002 Vernal Field Office Evaluation of New Information*. In addition, on April 2, 2007, the interdisciplinary team reviewed changes to the area since 2002 that could affect the presence or absence of wilderness characteristics. There are several private and State land parcels which are adjacent to or surrounded by the WIA, however State and private lands are not included in the inventory area.

Size: Areas with wilderness characteristics must be 5,000 contiguous acres or larger. Following the April 2007 BLM review it was determined that 71% (21,211 acres) of the 29,775 acres reviewed along the

White River met all of the criteria needed for wilderness values defined as “naturalness” and possessing “opportunities for solitude and primitive and unconfined recreation” (Figure 10). There are several Tribal and State land parcels which are adjacent to or surrounded by, but excluded from, the wilderness characteristics area.

Naturalness: The rugged topography and size of the area diminishes any human-made developments to be unnoticeable. Current developments within the White River area that contain wilderness characteristics (Federal lands only) include one plugged and abandoned well, and one producing well. In addition, the Utah Division of Oil, Gas, and Mining has approved 44 Applications for Permit to Drill (APDs). To date, the BLM has not finalized the processing of these APDs. In addition to existing development, 36% of the WIA wilderness characteristics area has been previously leased for oil and gas development. Development areas that have been cherry-stemmed out of the area possessing wilderness characteristics include: 1) the existing producing well (section 31, T10S, R23E); 2) roads currently designated on the Uintah County Transportation Plan as Road 4150 (a branch of the Archy Bench Road), the Saddletree Draw Road (#4230), the Atchee Wash Road (#4240), and the Asphalt Wash Road (#4250); 3) a small portion of the land (~5,000 acres) in the SWSE of Section 24, T10S, R22E that is segregated by State and private lands; 4) a small portion of land (~5,000 acres) between Atchees Wash Road and the Section line in Section 3, T11S, R23E which is segregated by State land and a patented mining claim.

Outstanding Opportunities for Solitude, and Primitive and Unconfined Recreation: The size of the area as described under *Naturalness* is large enough to ensure opportunities for solitude and primitive and unconfined recreation. Visitors to the area take advantage of hiking, floating, camping, and photography. Details regarding the recreational use of the area can be found in Section 3.2.8. County-claimed roads, one plugged and abandoned well, and one producing well, influence visitor’s expectations of solitude by introducing human elements into an otherwise natural setting.

Supplemental Values: The deep canyons, high ridges, cliffs, and unique geologic features provide scenic views for visitors. The Powell expedition noted this area to contain “Goblin City”, an area of unique geology. The cottonwood trees along the river and the pinyon and juniper forests to the south combine to provide a variety of form, line, color, and area that produces strong visual contrast. Antelope, mule deer and elk are common in the area. A variety of birds are found along the river and the canyon walls. Habitat for sensitive plant and animal species is also present.

While the BLM recognizes the area as possessing wilderness characteristics, the right to explore and develop existing oil and gas leases on lands with or likely to have wilderness characteristics remains valid, and those valid existing rights would not be pre-empted by subsequent land use proposals or designations of wilderness.

3.2.16 Climate and Air Quality

Regional air quality is influenced by a combination of factors including climate, meteorology, the magnitude and spatial distribution of local and regional air pollution sources, and the chemical properties of emitted pollutants. Within the lower atmosphere, regional and local scale air masses interact with regional topography to influence atmospheric dispersion and transport of pollutants. The following sections summarize the climatic conditions and existing air quality within the Rock House Project Area and surrounding region.

Climate

The transportation and dilution of air pollutants are primarily a function of wind speed and direction. Winds dictate the direction in which pollutants are transported. As wind speed increases, the dispersion of emitted pollutants also increases, thereby reducing pollutant concentrations.

Wind data within the Project Area have not been directly measured. Local terrain effects will influence the wind profiles specific to the Project Area. However, representative wind speed and direction data for the Uinta Basin are available at the Bonanza Deseret Power Plant for the years 1985, 1986, 1987, and 1992 (Utah Division of Environmental Quality - Division of Air Quality 1998). The Deseret Power Plant has the closest climate information available for the Project Area (approximately 20 miles southwest of the power plant). Figure 3-1 presents a wind rose depicting wind speed and direction for all four years of data. Note that the data represent the direction from which the wind is blowing (Wind Direction Origin). For example, winds blowing from the north would transport pollutants to the south. As shown, winds originate predominately from the east-northeast 16.7 percent of the time. The average measured wind speed is 3 meters per second.

The degree of stability in the atmosphere is also important to the dispersion of emitted pollutants. During stable conditions, vertical movement in the atmosphere is limited and the dispersion of pollutants is inhibited. Temperature inversions can result in very stable conditions with virtually no vertical air motion, thereby restricting dispersion. Conversely, during convective conditions, upward and downward movement in the atmosphere prevails, and the vertical mixing of pollutants in the atmosphere is enhanced.

Atmospheric stability can be categorized by stability classes "A" through "F", with "A" representing a high degree of atmospheric turbulence, and "F" representing a high degree of atmospheric stability. A "D" stability represents a neutral atmosphere. Table 3-6 below presents the frequency distribution of the atmospheric stability classes for the region. As illustrated, slightly stable (Class E) atmospheric conditions occur the majority of the time (31.6%), followed by neutral conditions (27.1%) and moderately stable conditions (16.3%).

Table 3-6. Atmospheric Stability Class Frequency of Occurrence

Stability Class	Frequency of Occurrence
A – Strongly Convective	9.9%
B – Moderately Convective	6.5%
C – Slightly Convective	8.5%
D – Neutral	27.1%
E – Slightly Stable	31.6%
F – Moderately Stable	16.3%
Total	100%

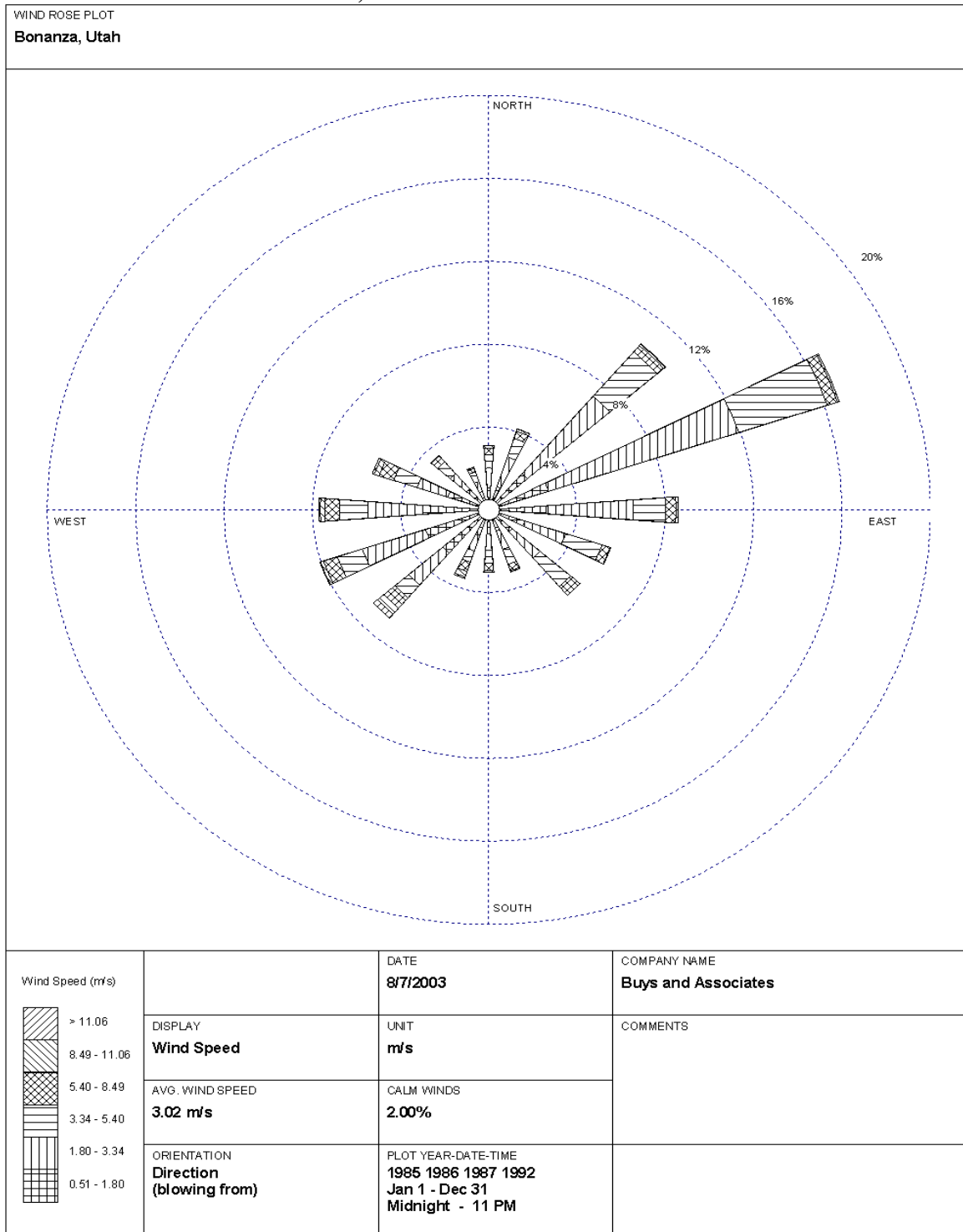
Source: Utah Division of Environmental Quality - Division of Air Quality (1998). Meteorological data collected near Bonanza, UT at the Deseret Generating and Transmission power plant for the years 1985, 1986, 1987 and 1992.

The potential for atmospheric dispersion is relatively high for the Project Area due to the frequency of strong winds. However, calm periods and nighttime cooling may enhance air stability, thereby inhibiting

air pollutant transport and dilution. The region can experience frequent temperature inversions in winter when cold stable air masses settle into the valleys and snow cover and shorter days inhibit ground-level warming. Temperature inversions are less common during the summer months when daytime ground-level heating rapidly leads to inversion break-up and increased vertical mixing. The higher locations of the Project Area generally will remain warmer at night and less prone to the temperature inversions common to the valleys and drainages.

Mixing height is defined as the thickness of the air mass above ground within which rising warm air from the surface mixes by convection and turbulence. Local atmospheric conditions, terrain configuration, and source location determine the degree to which pollutants are diluted in this mixed layer. Mixing heights vary diurnally, with local weather systems, and seasonally. For the region, the mean annual morning mixing height is estimated to be approximately 300 meters, and the mean annual afternoon mixing height is approximately 2,400 meters (Holzworth 1972).

Figure 3-1. Windrose for Bonanza, Utah.



WRPLOT View 3.5 by Lakes Environmental Software - www.lakes-environmental.com

This page intentionally left blank.

Under the Prevention of Significant Deterioration (PSD) provisions of the Clean Air Act (CAA), incremental increases of specific pollutant concentrations are limited above a legally defined baseline level. The area surrounding the Project is designated as PSD Class II. For Class II areas, incremental increases in ambient pollutant concentrations are allowed as a result of controlled growth. The PSD increments for Class II areas are presented in Table 3-2.

Table 3-7. Ambient Criteria Pollutant Concentrations in the Uinta Basin

Pollutant	Averaging Period(s)	Uinta Basin Background Concentration ^a (µg/m ³)	NAAQS (µg/m ³)	PSD Class II Increments (µg/m ³)
SO ₂	Annual	5	80	20
	24-hour	10	365	91
	3-hour	20	1,300	512
NO ₂	Annual	5	100	25
PM ₁₀	Annual	10	50	17
	24-hour	28	150	30
PM _{2.5}	Annual	9	15	None
	24-hour	25	65	None
CO	8-hour	1,111	10,000	None
CO	1-hour	1,111	40,000	None
O ₃	1-hour	157	235	None
O ₃	8-hour	105	157	None

^a Source: Dave Prey, Utah Division of Environmental Quality - Division of Air Quality (UDAQ), Personal Communication, November 30th, 2005. Data represent UDAQ estimates for rural areas within the Uinta Basin.

Hazardous Air Pollutants

Hazardous air pollutants (HAPs) are those pollutants that are known or suspected to cause cancer or other serious health effects, such as reproductive effects or birth defects, or adverse environmental impacts. The EPA has classified 187 air pollutants as HAPs. Examples of listed HAPs associated with the oil and gas industry include formaldehyde, BTEX compounds (benzene, toluene, ethylbenzene, isomers of xylene), and normal-hexane (n-hexane).

There are no applicable Federal or State of Utah ambient air quality standards for assessing potential HAP impacts to human health. However, in order to provide a basis for assessing HAP exposures, the State of Utah has adopted Toxic Screening Levels (TSLs) which are applied during the air permitting process to assist in the evaluation of hazardous air pollutants released into the atmosphere (Utah Department of Environmental Quality-Air Quality Division 2000). The TSLs are derived from Threshold Limit Values (TLVs) published in the American Conference of Governmental Industrial Hygienists (ACGIH) – “Threshold Limit Values for Chemical Substances and Physical Agents” (American Conference of Governmental Industrial Hygienists 2003). These levels are not standards that must be met, but screening thresholds which if exceeded, would suggest that additional information is needed to evaluate potential health and environmental impacts. Table 3-8 lists the corresponding TSLs for each applicable HAP.

Table 3-8. Utah Toxic Screening Levels (TSLs)

Pollutant and Averaging Time	Toxic Screening Levels ^b (µg/m ³)
Formaldehyde (1-hour)	37
Benzene ^a (24-hour)	53
Toluene (24-hour)	6,280
Ethylbenzene (1-hour)	54,274
Ethylbenzene (24-hour)	14,473
Xylene (1-hour)	65,129
Xylene (24-hour)	14,473
n-Hexane (24-hour)	5,875

^a Although there exists an acute TLV for benzene, the State of Utah does not apply a comparison to an acute TSL since the chronic TSL is more stringent.

^b Source: Utah Department of Environmental Quality - Air Quality Division (2000).

Existing Sources of Air Pollution

The Uinta Basin has seen recent oil and gas development on Tribal, Federal, and private lands. Fugitive dust is the most prominent air pollutant in the region and in the proposed Rock House Project Area and is intermittent depending on winds and dust-causing activities.

Existing point and area sources of air pollution within the Rock House Project Area and surrounding region include the following:

- Exhaust emissions, primarily CO, oxides of nitrogen (NO_x), and formaldehyde, from existing natural gas fired compressor engines used in production of natural gas;
- natural gas dehydrator still-vent emissions of BTEX and *n*-hexane;
- gasoline and diesel-fueled vehicle tailpipe emissions of volatile organic compounds (VOC), NO_x, CO, SO₂, PM₁₀, and PM_{2.5};
- oxides of sulfur (SO_x), NO_x, and fugitive dust emissions from coal-fired power plants and coal mining and processing;
- fugitive dust (in the form of PM₁₀ and PM_{2.5}) from vehicle traffic on unpaved roads, wind erosion in areas of soil disturbance, and road sanding during winter months; and
- long-range transport of pollutants from distant sources contributing to regional haze.

This page intentionally left blank.