Summary of Changes to CO-110-2006-120-EA

In response to public comments, the Environmental Assessment for the Chevron U.S.A. Oil Shale Research, Development, and Demonstration Proposal has been revised to provide clarification and to include additional information necessary for analysis.

Page 3 – Description of Proposed Action and Alternatives Section

The paragraph was modified to address the Plan of Development to be submitted as a standard lease term.

Original Text: "The BLM proposes leasing a 160-acre tract located approximately 45 miles southwest of Meeker, Colorado, and authorizing a plan of operations for an oil shale research, development, and demonstration project."

Revised Text: "The BLM proposes leasing a 160-acre tract located approximately 45 miles southwest of Meeker, Colorado, and requiring the applicant to submit, as a standard lease term, a Plan of Development for an oil shale research, development, and demonstration project."

Page 6 – Proposed Action Section

Process Overview

A sentence was added to include a discussion on integrating a system for measuring hydraulic head.

Original Text: "Chevron believes that these fractured zones would have a very high horizontal to vertical component which would allow for the maintenance of a barrier within the target interval. This barrier between the production zone and the upper (A groove) and lower (B groove) water bearing units (see Figure 4 for the Lithologies Near the Proposed Lease Area) would be achieved by creating fractured areas, or "pockets", approximately 1 to 5 acres wide and 50 feet high within the center of the 200-foot oil shale deposit. In this way, a large volume (about 75 feet) of the confining layer would separate the proposed process from the water bearing units above and below. Absent the intersection of natural fractures that communicate with the water bearing intervals, this method of process containment would keep the aquifers out of the production zone. The detection and avoidance of the natural vertical fractures within the formation is a key component of the proposed technology. See Figure 5 for an illustration of Chevron's concept for Pilot Oil Shale RD&D."

Revised Text: "Chevron believes that these fractured zones would have a very high horizontal to vertical component which would allow for the maintenance of a barrier within the target interval. This barrier between the production zone and the upper (A groove) and lower (B groove) water bearing units (see Figure 4 for the Lithologies Near the Proposed Lease Area) would be achieved by creating fractured areas, or "pockets", approximately 1 to 5 acres wide and 50 feet high within the center of the 200-foot oil shale deposit. In this way, a large volume (about 75 feet) of the confining layer would separate the proposed process from the water bearing units above and below. Absent the intersection of natural fractures that communicate with the water bearing intervals, this method of process containment would keep the aquifers out of the production zone. Chevron would consider integrating a dedicated system for measuring hydraulic head as a potential method for assessing the performance of the confining layers. The detection and avoidance of the natural vertical fractures within the formation is a key component of the proposed technology. See Figure 5 for an illustration of Chevron's concept for Pilot Oil Shale RD&D."

Page 11 –Proposed Action Section

Surface and Groundwater Management

The paragraph was modified to include the concept that the Mahogany zone is anticipated to act as a confining layer by natural or anthropogenic means.

Original Text: "The proposed project is designed to take advantage of the impermeable and confining nature of the Mahogany zone to inhibit the process from coming into contact with the aquifer systems above and below the target interval. The upper aquifer would be contained using well casing designed specifically to prevent the groundwater from coming in contact with production fluids. As discussed above, the induced horizontal fractures are not expected to extend into the lower aquifer system, but would be contained within the process interval by maintaining a sufficient buffer within the confining layer to exclude the lower water bearing units from production processes."

Revised Text: "The Mahogany zone is anticipated to act like a confining layer either through natural or anthropogenic means, and the proposed project is designed to take advantage of the impermeable and confining nature of the Mahogany zone to inhibit the process from coming into contact with the aquifer systems above and below the target interval. The upper aquifer would be contained using well casing designed specifically to prevent the groundwater from coming in contact with production fluids. As discussed above, the induced horizontal fractures are not expected to extend into the lower aquifer system, but would be contained within the process interval by maintaining a sufficient buffer within the confining layer to exclude the lower water bearing units from production processes."

Page 16 – Proposed Action Section

Surface Facilities

Language was added to explain the reason that the equipment list does not match the emission sources used in near field source modeling.

Original Text: "Diesel generators would remain onsite during the first three phases of the operation, after which these would be replaced by an external power source. The coring, seismic, and fracturing phases of Chevron's technology would require storage tanks for fuel, water, and drilling fluids as needed. Propellant, explosive, and/or proppant materials may be used in the fracturing process. These materials would be brought onto the site in sealed containers and stored in appropriately designed facilities in accordance with all federal, state, and local laws and regulations. The major project facilities are listed below:"

Revised Text: "Diesel generators would remain onsite during the first three phases of the operation, after which these would be replaced by an external power source. The coring, seismic, and fracturing phases of Chevron's technology would require storage tanks for fuel, water, and drilling fluids as needed. Propellant, explosive, and/or proppant materials may be used in the fracturing process. These materials would be brought onto the site in sealed containers and stored in appropriately designed facilities in accordance with all federal, state, and local laws and regulations. The typical project facilities include, but are not limited to, the following:"

Page 16 – Proposed Action Section

Additional Project Design Features

Language was added to clarify CDPHE-APCD permitting requirements.

Original Text: "Chevron would obtain construction emissions permits, and permits for regulated air pollution sources through the Colorado Department of Public Health and Environment (CDPHE) Air Pollution Control Division (APCD) to ensure compliance with all federal and state air quality standards, and would comply with all county and state permit conditions and stipulations."

Revised Text: "Chevron would obtain construction emissions permits, and permits for regulated air pollution sources through the Colorado Department of Public Health and Environment (CDPHE) Air Pollution Control Division (APCD). For any emissions source with the potential to emit any "criteria" pollutant in excess of 2 tons per year or any "non-criteria" pollutant in excess of the corresponding limit for that non-criteria pollutant, an Air Pollution Emissions Notice (APEN) must be submitted to the CDPHE-APCD. Emissions sources required to file an APEN may also be subject to Construction Permitting requirements as listed in Colorado Regulation Number 3, Part B; 3). APENs must be updated annually if operating conditions change, or otherwise expire every five years."

Page 16 – Proposed Action Section

Additional Project Design Features

Language was added to introduce an appendix outlining the typical permits required for RD&D construction and operation.

Original Text: None.

Revised Text: "Chevron would obtain and comply with all permits that may be required for construction and operation of the RD&D project. See Appendix B for a list of the typical permitting requirements." (Appendix B was added to the document immediately following Appendix A)."

Page 23 - Air Quality Section

Regulatory Framework

The paragraph was modified to correct the assumption that the EPA is not solely responsible for implementing ozone and PM2.5 NAAQS standards.

Original Text: "The EPA establishes and revises the NAAQS as necessary to protect public health and welfare, setting the absolute upper limits for specific air pollutant concentrations at all locations where the public has access. Although the EPA recently revised both the ozone and PM2.5 NAAQS, these revised limits will not be implemented by the Colorado Department of Public Health and Environment-Air Pollution Control Division (CDPHE-APCD) until the Colorado State Implementation Plan is formally approved by EPA. Until then, the EPA is responsible for implementing these revised standards."

Revised Text: "The EPA establishes and revises the NAAQS as necessary to protect public health and welfare, setting the absolute upper limits for specific air pollutant concentrations at all locations where the public has access. Although the EPA recently revised both the ozone and PM2.5 NAAQS, these revised limits will not be implemented by the Colorado Department of Public Health and Environment-Air Pollution Control Division (CDPHE-APCD) until the Colorado State Implementation Plan is formally approved by EPA. Until then, the EPA is responsible for implementing these standards. However, the State of Colorado does implement and enforce the federal air quality standards for PM2.5 and 8-hour ozone through permitting and air quality plans."

Page 27 - Air Quality Section

Potential Construction Impacts

Language was added to the section to include dust mitigation.

Original Text: None

Revised Text: "Chevron plans to use dust mitigation during construction, and at facility operations and access roads to minimize fugitive dust emissions."

Page 27 - Air Quality Section

Potential Operational Impacts

Language was added to the section to include emissions mitigation.

Original Text: None

Revised Text: "Chevron plans to install Non-Selective Catalytic Reduction (NSCR) control on gas fired combustion units, and to use Tier II or better standards for diesel combustion engines/generators to minimize impacts resulting from emissions."

Page 29: Areas of Environmental Concern Section

Environmental Consequences of the Proposed Action

The paragraph was changed to correct assumption that fugitive dust would have no effect on the Dudley Bluffs ACEC because the road is paved.

Original Text: "Construction and operation of the proposed RD&D project would not affect Dudley Bluffs or any other ACEC. Although County Road 5 would be a principle access route to and from the proposed RD&D site, the road is paved and that area, including Dudley Bluffs, would not be affected by fugitive dust generated by project-related traffic. "

Revised Text: "Construction and operation of the proposed RD&D project would not affect Dudley Bluffs or any other ACEC. Although County Road 5 would be a principle access route to and from the proposed RD&D site, the road is paved and the fugitive dust generated by project related traffic would be minimal."

Page 41 – Migratory Birds Section

Subalternative - Proposed Action with Mitigation

The section was changed to include No Surface Occupancy and Timing Limitation exceptions, modifications, and waivers.

Original Text: "In addition to the design features included in the Proposed Action, the BLM would require the following mitigation measures to ensure that impacts to migratory birds would be minimized:

- If construction is delayed until February 1, 2007, a new survey for nesting migratory birds, including raptors, will be needed before project initiation.
- No surface occupancy will be allowed within 1/2 mile of active nests of threatened, endangered, or BLM sensitive species of migratory birds, including raptors, from February 1 through August 15 (1/8 mile for all non-listed migratory bird species). The BLM will be contacted and USFWS will be consulted if any special status species nests are discovered on or adjacent to the project area.
- Timing Limitation stipulations would be applied to active, non-Special Status raptor nests (i.e., those species not classified as listed, proposed, or candidate species for listing under the Endangered Species Act and non-BLM sensitive species). No development or construction-related activities would be allowed within 1/4 mile of identified nest(s) from February 1 through August 15.
- Migratory bird access to, or contact with, reserve pit contents that possess toxic properties from ingestion or exposure or that have the potential to compromise the water-repellent properties of birds' plumage will be effectively precluded. Exclusion methods may include netting, the use of "bird-balls," or other alternative methods that effectively eliminate migratory bird contact with pit contents and meet the BLM's approval. Chevron will notify the BLM of the method that will be used at least two weeks prior to initiation of construction activities. The BLM-approved method will be applied within 24 hours after construction activities have begun. All lethal and non-lethal events that adversely affect migratory birds will be reported to a WRFO Petroleum Engineer Technician immediately."

Revised Text: "Under this alternative, in addition to the proposed action, BLM would require the following mitigation to ensure impacts to migratory birds would be minimized by implementation:

- Conduct follow-up surveys if construction activities do not begin prior to February 1, 2007;
- Minimize, where possible, vegetation clearing while migratory birds are nesting (February 1 through August 15);

- If reserve pits are deemed necessary on site, ensure that pits are lined, fenced on all four sides with net-wire, and covered with plastic barrier to exclude both large and small animals and netted to prevent birds from accessing these pits. Plastic flagging has proven to be ineffective at deterring migratory waterfowl from using reserve pits for foraging, resting or as a source of free water. The Operator will notify the BLM via Sundry Notice of the method that will be used to prevent impacts to migratory birds two weeks prior to the date when completion activities are expected to begin. The BLM-approved method will be applied within 24 hours after completion activities have begun.
- All lethal and non-lethal events that adversely affect migratory birds will be reported to a WRFO Petroleum Engineer Technician and Wildlife Biologist immediately.

No special status species are presently known to occur in the project area. If surveys reveal special status species to be present, Chevron must comply with the following measures detailed in Appendix A of the White River Resource Area RMP (1997):

- No development activities are allowed within l/2 mile of identified nest sites of listed, candidate, or BLM sensitive raptor species (except Bald Eagle and Ferruginous Hawk) from February 1 through August 15, or until fledging and dispersal of young. Development activities are allowed from August 16 through January 31;
- No development activities allowed within l/4 mile of identified nests of other special status raptor species from February 1 through August 15, or until fledging and dispersal of young. Development activities are allowed from August 16 through January 31;
- No development is allowed within one (1) mile of identified nests of Ferruginous Hawks from February 1 through August 15, or until fledging and dispersal of young. Development activities allowed from August 16 through January 31;
- No surface occupancy within l/4 mile of an identified nest of an ESA listed, proposed, or candidate raptor species;
- No surface occupancy within l/8 mile of an identified nest of other special status raptor species;

These mitigation measures can be exempted, modified, or waived by BLM if conditions warrant and the decision is documented through an environmental analysis. An exception would suspend the stipulation on a one-time basis. Modifications would temporarily or permanently change the language or provision of a stipulation. Waivers are utilized to permanently remove the stipulation due to changed circumstances. Conditions for granting an exception, modification, or waiver are described in the Appendix A of the White River Resource Area RMP (1997)."

Page 49 – Threatened, Endangered, and Sensitive Animal Species Section

Subalternative - Proposed Action with Mitigation

The section was changed to include No Surface Occupancy and Timing Limitation exceptions, modifications, and waivers.

Original Text: "In addition to the design features of the Proposed Action, impacts to special status species would be minimized by implementing the following mitigation measures:

- Follow-up raptor surveys would be conducted if construction activities do not begin prior to the 2007 raptor nesting season;
- Surveys would be conducted prior to construction activities to determine which species will require clearance surveys in the project area if construction occurs in spring of 2007.
- No Surface Occupancy stipulations would be applied to active Special Status raptor nests (i.e., those species classified as listed, proposed, or candidate species for listing under the Endangered Species Act and BLM-sensitive species) and would include an area within a radius of 1/4 mile. Surface occupancy would not be allowed within 1/4 mile of the identified nest(s).
- Timing Limitation stipulations would be applied to active Special Status raptor nests (i.e., those species classified as listed, proposed, or candidate species for listing under the Endangered Species Act and BLM-sensitive species). No development or construction-related activities would be allowed within 1/2 mile of identified nest(s) from February 1 through August 15. Consultation with the USFWS will be initiated if any special status species nests are discovered on or adjacent to the project area;
- Interim and final reclamation of the proposed 160-acre lease parcel would include seeding with approved plant species likely to result in habitat suitable for Greater sage grouse. Final reclamation would be conducted upon expiration of the 10-year lease, or at such time that the RD&D project did not meet economic expectations.

Reserve pits would be lined, fenced on all four sides with net-wire and covered with plastic barrier to exclude both large and small animals, and pre-approved deterrent methods, such as "bird-balls" or netting, would be used to prevent birds from accessing the pits. Reserve pits would be reclaimed as soon as possible after use."

Revised Text: "In addition to the proposed action, impacts to special status species would be further minimized by implementing the following mitigation measures:

- The Operator or Operator's proponent will conduct follow-up raptor surveys if construction activities do not begin prior to February 1, 2007;
- Conduct special status species surveys prior to construction activities to determine which species clearances may be needed if construction is planned to begin after April 1, 2007;

- If reserve pits are deemed necessary on site, ensure that pits are lined, fenced on all four sides with net-wire, and covered with plastic barrier to exclude both large and small animals and netted to prevent birds from accessing these pits;
- Reclaim reserve pits as soon as possible after use;
- Adhere to the requirements of USFWS Biological Opinion and the Colorado River Fish Species recovery program.

No special status species are presently known to occur in the project area. If surveys reveal special status species to be present, Chevron must comply with the following measures detailed in Appendix A of the White River Resource Area RMP (1997):

- No development activities are allowed within l/2 mile of identified nest sites of listed, candidate, or BLM sensitive raptor species (except Bald Eagle and Ferruginous Hawk) from February 1 through August 15, or until fledging and dispersal of young. Development activities are allowed from August 16 through January 31;
- No development activities allowed within l/4 mile of identified nests of other special status raptor species from February 1 through August 15, or until fledging and dispersal of young. Development activities are allowed from August 16 through January 31;
- No development is allowed within one (1) mile of identified nests of Ferruginous Hawks from February 1 through August 15, or until fledging and dispersal of young. Development activities allowed from August 16 through January 31;
- No surface occupancy within l/4 mile of an identified nest of an ESA listed, proposed, or candidate raptor species;
- No surface occupancy within l/8 mile of an identified nest of other special status raptor species;

These mitigation measures can be exempted, modified, or waived by BLM if conditions warrant and the decision is documented through an environmental analysis. An exception would suspend the stipulation on a one-time basis. Modifications would temporarily or permanently change the language or provision of a stipulation. Waivers are utilized to permanently remove the stipulation due to changed circumstances. Conditions for granting an exception, modification, or waiver are described in the White River Resource Area RMP."

Page 51 – Threatened, Endangered, and Sensitive Animal Species

Endangered Species Act Section 7 Consultation

The section was added to include the results of Endangered Species Act Section 7 Consultation.

Original Text: None

Revised Text: "The USFWS reviewed the Biological Assessment (BA) to assess the potential impacts of the Proposed Action with Mitigation on federally listed endangered, threatened, proposed for listing, and candidate species. In a letter, dated September 12, 2006, the USFWS responded to the BA for the five oil shale RD&D projects. In its biological opinion (ES/GJ-6-CO-94-F017), the USFWS concurred with the conclusions of the oil shale RD&D BAs for all federally listed endangered, threatened, proposed for listing, and candidate species.

The USFWS additionally determined that the five RD&D projects fit under the umbrella of the programmatic biological opinion for small water depletions caused by BLM authorized activities. The company has been notified of its responsibility to make annual payments to the National Fish and Wildlife Foundation as specified in the USFWS biological opinion."

Page 58 – Water Quality, Surface and Ground Section

Affected Environment

The last sentence of the paragraph was corrected.

Original Text: "The "Status of Water Quality in Colorado, 2004" and the 2006 update (CDPHE, 2006b) were reviewed for information related to the project area drainages. The proposed oil shale RD&D parcel is located within stream segment 20 of the White River Basin, which is defined as the mainstems of Black Sulphur and Hunter Creeks from their sources to their confluences with Piceance Creek. Segment 20 has not been designated use-protected. Waters not satisfying either outstanding water or use-protected criteria will remain undesignated, and will be subject to the antidegradation review provisions set forth in Section 31.8(3) of Standard 31, Basic Standards and Methodology of Surface Water. For these waters, no degradation is allowed unless deemed appropriate following an antidegradation review. These provisions are applicable only if these waters are discharged."

Revised Text: "The "Status of Water Quality in Colorado, 2004" and the 2006 update (CDPHE, 2006b) were reviewed for information related to the project area drainages. The proposed oil shale RD&D parcel is located within stream segment 20 of the White River Basin, which is defined as the mainstems of Black Sulphur and Hunter Creeks from their sources to their confluences with Piceance Creek. Segment 20 has not been designated use-protected. Waters not satisfying either outstanding water or use-protected criteria will remain undesignated, and will be subject to the antidegradation review provisions set forth in Section 31.8(3) of Standard 31, Basic Standards and Methodology of Surface Water. For these waters, no degradation is allowed unless deemed appropriate following an antidegradation review. These provisions are applicable only if a discharge is made to these waters."

Page 59 – Water Quality, Surface and Ground Section

Affected Environment

Two sentences were revised to remove the implication that minimum in-stream flow was a requirement, and to reflect the possibility that Hunter Creek supports seasonal aquatic life.

Original Text: "The state has classified segment 20 as being beneficial for the following uses: Cold aquatic life 1, Recreation 2, and Agriculture. The CDPHE defines Aquatic Life Cold Class 1 waters as being capable or potentially capable of sustaining a wide variety of cold-water biota. Recreation Class 2 waters are suitable or intended to become suitable for recreational uses on or about the water, including fishing and other streamside recreation. Agriculture waters are suitable or intended to become suitable for irrigation of crops and that are not hazardous as drinking water for livestock. The CDPHE has determined that stream segment 20 of the White River Basin is fully supporting of its designated uses except Recreation Class 2, which has not been assessed (CDPHE, 2006b). In addition, Black Sulphur Creek has minimum in-stream flow requirements for preservation of aquatic life and habitat, and Hunter Creek does not provide sufficient year-around water flows to support aquatic life and habitat."

Revised Text: "The state has classified segment 20 as being beneficial for the following uses: Cold aquatic life 1, Recreation 2, and Agriculture. The CDPHE defines Aquatic Life Cold Class 1 waters as being capable or potentially capable of sustaining a wide variety of cold-water biota. Recreation Class 2 waters are suitable or intended to become suitable for recreational uses on or about the water, including fishing and other streamside recreation. Agriculture waters are suitable or intended to become suitable for irrigation of crops and that are not hazardous as drinking water for livestock. The CDPHE has determined that stream segment 20 of the White River Basin is fully supporting of its designated uses except Recreation Class 2, which has not been assessed (CDPHE, 2006b). In addition, Black Sulphur Creek has minimum in-stream flow that may support a more diverse aquatic community, and Hunter Creek does not have year around flow, but may support aquatic life on a seasonal basis."

Page 59 – Water Quality, Surface and Ground Section

Affected Environment

Language was added to include CDPHE-WQCC Regulation 61

Original Text: "The Colorado River Basin Salinity Control Forum (CRBSCF) is concerned with energy development and the movement of salts downstream in the Colorado River Basin. The CRBSCF was formed to develop interstate cooperation, and to provide the Basin States (Arizona, California, Colorado, Nevada, New Mexico, Utah, and Wyoming) with the information necessary to comply with Section 303(a) and (b) of the Clean Water Act. The U.S. Environmental Protection Agency (EPA) enacted a regulation in December of 1974 that set forth a basin-wide salinity control policy for the Colorado River Basin, and in 1975, the CRBSCF proposed, the Basin States adopted, and the EPA approved water quality standards to control salinity increases in the Colorado River. The nearest downstream water quality standard is below Hoover Dam and is 723 mg/L. Congress enacted the Colorado River Basin Salinity Control Act, Public Law 93-320 1974 Title II-Water Quality Program for Salinity Control, and amended in 1984. This Act directed the BLM to implement a comprehensive program to minimize salt loading in the Colorado River Basin, and coordinate salinity control activities with the CRBSCF, the Basin States, the U.S. Bureau of Reclamation (USBR), and the U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS). Other federal agencies that participate in the CRBSCF Work Group meetings include the EPA, U.S. Fish and Wildlife Service (USFWS), and the U.S. Geological Survey (USGS). In addition, the CDPHE-WQCC Regulation No. 39, Colorado River Salinity Standards, establishes water quality standards for salinity or total dissolved solids for the Colorado River and its tributaries in Colorado."

Revised Text: "The Colorado River Basin Salinity Control Forum (CRBSCF) is concerned with energy development and the movement of salts downstream in the Colorado River Basin. The CRBSCF was formed to develop interstate cooperation, and to provide the Basin States (Arizona, California, Colorado, Nevada, New Mexico, Utah, and Wyoming) with the information necessary to comply with Section 303(a) and (b) of the Clean Water Act. The U.S. Environmental Protection Agency (EPA) enacted a regulation in December of 1974 that set forth a basin-wide salinity control policy for the Colorado River Basin, and in 1975, the CRBSCF proposed, the Basin States adopted, and the EPA approved water quality standards to control salinity increases in the Colorado River. The nearest downstream water quality standard is below Hoover Dam and is 723 mg/L. Congress enacted the Colorado River Basin Salinity Control Act, Public Law 93-320 1974 Title II-Water Quality Program for Salinity Control, and amended in 1984. This Act directed the BLM to implement a comprehensive program to minimize salt loading in the Colorado River Basin, and coordinate salinity control activities with the CRBSCF, the Basin States, the U.S. Bureau of Reclamation (USBR), and the U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS).

Other federal agencies that participate in the CRBSCF Work Group meetings include the EPA, U.S. Fish and Wildlife Service (USFWS), and the U.S. Geological Survey (USGS). In addition, the CDPHE-WQCC Regulation No. 39, Colorado River Salinity Standards, establishes water quality standards for salinity or total dissolved solids for the Colorado River and its tributaries in Colorado, and Regulation 61 discusses the implementation of the provision of Regulation 39 in discharge permits."

Page 60 – Water Quality, Surface and Ground Section

Affected Environment

Language was added to include process wastewater as a potential source of increased salinity and the movements of salts downstream.

Original Text: "Because the Proposed Action would disturb soils, and could increase the potential for erosion and sediment transport, the aforementioned laws and regulations would be in effect at the proposed project location to minimize and/or prevent the movement of salts downstream."

Revised Text: "Because the Proposed Action would disturb soils, and could increase the potential for erosion and sediment transport, the aforementioned laws and regulations would be in effect at the proposed project location to minimize and/or prevent the movement of salts downstream. In addition, a process water discharge would also have the potential to contribute to salinity levels and would also be subject to applicable laws and regulations."

Page 62 – Water Quality, Surface and Ground Section

Affected Environment

Sentence was modified to correct the higher upper limit of 3000 mg/L as applied to potable water supply.

Original Text: "The principal dissolved constituents in water from the lower aquifer system are sodium and bicarbonate. In the lower aquifer system, the dissolved solids concentration increases from about 1,000 to 20,000 mg/L near the north-central part of the basin. These high concentrations are likely a result from groundwater coming in contact with the ancient evaporate deposits of nahcolite, dawsonite, and halite associated with the Green River Formation. The trace element fluoride has also been detected in unusually high concentrations, ranging from 10 to 30 milligrams per liter in the lower aquifers. The trace elements barium, boron, and lithium are abundant in the lower aquifers where chloride concentrations are also greater than several hundred milligrams per liter (Tobin, R. 1987). Waters with dissolved solids concentrations in excess of 1,000 mg/L are generally unsuitable for potable supply. There is potential for salt and trace element delivery downstream both on surface and groundwater flow through fractures."

Revised Text: "The principal dissolved constituents in water from the lower aquifer system are sodium and bicarbonate. In the lower aquifer system, the dissolved solids concentration increases from about 1,000 to 20,000 mg/L near the north-central part of the basin. These high concentrations are likely a result from groundwater coming in contact with the ancient evaporate deposits of nahcolite, dawsonite, and halite associated with the Green River Formation. The trace element fluoride has also been detected in unusually high concentrations, ranging from 10 to 30 milligrams per liter in the lower aquifers. The trace elements barium, boron, and lithium are abundant in the lower aquifers where chloride concentrations are also greater than several hundred milligrams per liter (Tobin, R. 1987). Waters with dissolved solids concentrations in excess of 3,000 mg/L are generally unsuitable for potable supply. There is potential for salt and trace element delivery downstream both on surface and groundwater flow through fractures."

Page 63 – Water Quality, Surface and Ground Section

Environmental Consequences of the Proposed Action

Language was added to explain that reduced process temperatures and post operation mitigations would minimize impacts to groundwater resources.

Original Text: "Some impacts to groundwater resources resulting from hydraulic fracturing and heating of the Mahogany Zone are likely, but the extent of the impact is unknown. The natural vertical fracture and jointing patterns in some areas within the formation allow for communication between the upper and lower aquifer systems, and if the proposed process were to contact an existing fault that was in communication with two aquifer systems, natural mixing of those aquifers would have already occurred. In this case, Chevron would likely grout the natural fractures, or relocate the process facilities to avoid any further occurrences."

Revised Text: "Some impacts to groundwater resources resulting from hydraulic fracturing and heating of the Mahogany Zone are likely, but the extent of the impact is unknown. Chevron is developing technologies and methods to significantly reduce the temperatures required to decompose the kerogen, therefore the processes and products may have properties that are not consistent with a traditional retort. This, and post operation measures that would employ methods for restoring the function of the confining layer by grouting the fracture network to prevent the mixing of aquifers would minimize any impacts to groundwater resources. The natural vertical fracture and jointing patterns in some areas within the formation allow for communication between the upper and lower aquifer systems, and if the proposed process were to contact an existing fault that was in communication with two aquifer systems, natural mixing of those aquifers would have already occurred. In this case, Chevron would likely grout the natural fractures, or relocate the process facilities to avoid any further occurrences."

Page 63 – Water Quality, Surface and Ground Section

Environmental Consequences of the Proposed Action

Language was added to reflect that impacts to the regional transmissivity would be dependent on the post-operational methods employed.

Original Text: "The rate at which the poorer quality water travels downgradient is primarily a function of the existing gradient and the hydraulic conductivity of the water bearing zones. Chevron does not expect to change the parameters in the intervals that provide the regional transmissivity. This would be modeled to determine whether a reduction in the hydraulic conductivity in a transmissive interval above or below the production interval for containment purposes would be necessary. If the proposed retorting or hydrofracturing were to connect, or enhance, the potential for more rapid mixing between two aquifers of differing water quality, the hydraulic conductivity of the production zone would be adjusted as necessary to generally restore pre-existing water mixing patterns. The proposed process, as planned, would not create circumstances for the mixing of groundwater of greatly differing quality, and Chevron would develop and evaluate methods for accomplishing this during the pilot testing process."

Revised Text: "The rate at which the poorer quality water travels downgradient is primarily a function of the existing gradient and the hydraulic conductivity of the water bearing zones. Chevron does not expect to change the parameters in the intervals that provide the regional transmissivity. This would be modeled to determine whether a reduction in the hydraulic conductivity in a transmissive interval above or below the production interval for containment purposes would be necessary. Modeling would also be used to determine the most effective post-operation measures for restoring any impacts to the regional transmissivity (i.e. grouting of the production zone). If the proposed retorting or hydrofracturing were to connect, or enhance, the potential for more rapid mixing between two aquifers of differing water quality, the hydraulic conductivity of the production zone would be adjusted as necessary to generally restore pre-existing water mixing patterns. The proposed process, as planned, would not create circumstances for the mixing of groundwater of greatly differing quality, and Chevron would develop and evaluate methods for accomplishing this during the pilot testing process."

Page 65 - Water Quality, Surface and Ground Section

Compliance and Monitoring:

The reference to a Minimum Industry Discharge Permit (MINDI) was stricken from the text, and from Appendix A.

Original Text: "Chevron would complete a Spill Prevention, Control, and Countermeasure (SPCC) Plan as discussed in the Wastes, Solid or Hazardous section. Chevron would obtain all necessary federal and state permits, and would comply with the Army Corps of Engineers (COE) Nationwide Permit 12 conditions, CDPHE Water Quality Control Division (WQCD) Minimal Industry Discharge Permit Conditions, and all other applicable water quality permitting requirements. Any groundwater produced from the Mahogany zone would be characterized to determine its quality, and disposed of in accordance with Onshore Order #7, and BLM approval"

Revised Text: "Chevron would complete a Spill Prevention, Control, and Countermeasure (SPCC) Plan as discussed in the Wastes, Solid or Hazardous section. Chevron would obtain all necessary federal and state permits, and would comply with the Army Corps of Engineers (COE) Nationwide Permit 12 conditions, CDPHE Water Quality Control Division (WQCD) permit no. COR-030000 CDPS General Permit for Stormwater Discharges Associated with Construction Activity, and a COR-010000 CDPS General Permit for Operation Activities, and all other applicable water quality permitting requirements. Any groundwater produced from the Mahogany zone would be characterized to determine its quality, and disposed of in accordance with Onshore Order #7, and BLM approval."

Page 84 – Wildlife, Terrestrial Section

<u>Subalternative - Proposed Action with Mitigation</u>

The section was changed to include No Surface Occupancy and Timing Limitation exceptions, modifications, and waivers.

Original Text: "The Proposed Action identifies potential impacts to terrestrial wildlife. In order to mitigate these impacts, the BLM would require alternative mitigation measures to minimize the impacts to terrestrial wildlife including, but not limited to the following:

- Prohibit construction activities in severe/critical mule deer and elk winter range between December 1 and April 30.

- Redistribute any Large, woody material salvaged during clearing operations on BLM- administered lands, and disperse over the portion of the project area from which the trees and brush were originally removed to meet fire management objectives and to provide wildlife habitat, seedling protection, and a deterrent to vehicular traffic.
- Limit fencing to facilities that would otherwise present a hazard to humans and/or wildlife.
- Seed disturbed areas according to BLM recommendations.
- Support carpooling, and establish a policy of reduced speed.
- Ensure that reserve pits are lined, fenced on all four sides with net-wire and covered with plastic barrier to exclude both large and small animals. Use "bird-balls", netting, or other BLM-approved methods to prevent birds from accessing these pits. Reclaim reserve pits as soon as possible after use."

Revised Text: "The proposed action identifies potential impacts to terrestrial wildlife. In order to mitigate potential impacts, BLM would require alternative mitigation measures. Chevron would implement the following mitigation measures to minimize impacts:

- Redistribute large, woody material salvaged during clearing operations so as not to exceed 3 to 5 tons/acre, and mulch excess woody materials;
- Limit fencing on the tract to facilities that otherwise would present a hazard to humans and/or wildlife;
- Seed disturbed areas according to BLM recommendations;
- Support carpooling and establish a policy of reduced vehicular speed, especially at night and;
- If reserve pits are deemed necessary on site, ensure that pits are lined, fenced on all four sides with net-wire, and covered with plastic barrier to exclude both large and small animals and netted to prevent birds from accessing these pits."

Page 86 - Access and Transportation Section

Table 17 Baseline Traffic Data for Project Area

The date of CDOT data collection was added to table footnote.

Original Text: "Colorado Department of Transportation"

Revised Text: "Colorado Department of Transportation 2005"

Page 98 – Hydrology and Water Rights Section

Environmental Consequences of the Proposed Action

A sentence was included to reference the required State groundwater quality standard for site closure.

Original Text: "Following in-situ oil extraction, spent shale in the retort zone would be expected to contain various potential contaminants, including soluble salts, trace metals, and residual organics. Methods for reducing the contaminant mass, decreasing the solubilization rate of the contaminants, and/or reducing the rate of water movement through the spent shale zone would be investigated, and employed to mitigate any adverse impacts to groundwater quality."

Revised Text: "Following in-situ oil extraction, spent shale in the retort zone would be expected to contain various potential contaminants, including soluble salts, trace metals, and residual organics. Methods for reducing the contaminant mass, decreasing the solubilization rate of the contaminants, and/or reducing the rate of water movement through the spent shale zone would be investigated, and employed to mitigate any adverse impacts to groundwater quality in accordance with the required State groundwater quality standard needed to achieve site closure (5 CCR 1002-41, The Basic Standards for Groundwater, Section 41.5(C)(6))."

Page 100 - Noise Section

Environmental Consequences of the Proposed Action

The Rio Blanco County noise level standard of 65 dBA was added as the applicable daytime noise level.

Original Text: "It is anticipated that the Proposed Action would be classified as a light industrial facility in a remote location, where there is no reasonably proximate occupied structure or designated outside activity area. The light industrial standard may be applicable. The day time noise levels permitted under this standard is 70 dBA, and night time limits are reduced to 65 dBA."

Revised Text: "It is anticipated that the Proposed Action would be classified as a light industrial facility in a remote location, where there is no reasonably proximate occupied structure or designated outside activity area. The light industrial standard may be applicable. The daytime noise levels permitted under this standard is 70 dBA, and night time limits are reduced to 65 dBA. However, Rio Blanco County has a noise level standard of 65 dBA that would apply to daytime noise levels."

Page 106 – Realty Authorizations Section

Subalternative - Proposed Action with Mitigation

The paragraph was stricken from text to eliminate confusion about the BLM's right to waive permitting requirements.

Original Text: "Chevron would comply with all applicable State and County laws and regulations, and obtain all related applicable permits. This term/condition may be waived by the authorized officer if he/she determines that such State or local law, regulation, or permitting requirement impermissibly conflicts with the achievement of a congressionally approved use of public lands."

Revised Text: None

Page 123 – Cumulative Section

Air Quality

Table 23 entry for Visibility was changed from a value of "Greater than or equal to 1.0 deciview (days/year)" to "Equal to 1.0 deciview (days/year").

USFS concern threshold of 0.5 deciview was added to Table 23 footnote.

Page 123 – Cumulative Section

Water Resources, Surface and Ground

The paragraph was modified to state that the design and implementation of Stormwater Best Management Practices would reduce impacts to surface water resources.

Original Text: "Construction of the proposed RD&D projects could have short-term impacts on surface water resources if not properly mitigated. Cumulative impacts on surface water bodies affected by the Proposed Actions would be limited primarily to water bodies that are affected by other projects within the same watershed. Direct in-stream impacts associated with construction runoff and increased sediment loads during initial storm events following construction would have the greatest impacts on surface water resources. Runoff from construction activities at reasonably foreseeable projects near water bodies would also contribute to cumulative impacts."

Revised Text: "Construction of the proposed RD&D projects could have short-term impacts on surface water resources if not properly mitigated. Cumulative impacts on surface water bodies affected by the Proposed Actions would be limited primarily to water bodies that are affected by other projects within the same watershed. Direct in-stream impacts associated with construction runoff and increased sediment loads during initial storm events following construction would have the greatest impacts on surface water resources, but these impacts would only occur if best management practices are not properly designed and implemented. Runoff from construction activities at reasonably foreseeable projects near water bodies would also contribute to cumulative impacts."

Page 130 - Cumulative Section

Access and Transportation

The paragraph has been modified to include the impact of traffic on increased accidents requiring emergency response.

Original Text: "For transportation, the cumulative impact analysis area includes Rio Blanco CR 5 (Piceance Creek) and the associated local road network in the Piceance Creek area. These county roads were originally designed for rural and agricultural uses and were not intended for the repeated heavy loads associated with the current expansion in oil and gas production. The increasing traffic volume, frequency, and vehicle size on these rural roads has contributed to an increase in the costs associated with repair and maintenance of these county roads."

Revised Text: "For transportation, the cumulative impact analysis area includes Rio Blanco CR 5 (Piceance Creek) and the associated local road network in the Piceance Creek area. These county roads were originally designed for rural and agricultural uses and were not intended for the repeated heavy loads associated with the current expansion in oil and gas production. The increasing traffic volume, frequency, and vehicle size on these rural roads has contributed to an increase in the costs associated with repair and maintenance of these county roads. Sustained high levels of traffic could have secondary impacts as increased traffic could result in more accidents requiring emergency response, collisions with wildlife, as well as affecting the quality of recreation in the region."

Page 142 – References Cited Section

A citation was added to the References Cited section for the (EPA 1999).

Original Text: None

Revised Text: U.S. Environmental Protection Agency (EPA). 1999. The Class V Underground Injection Control Study. Vol. 13. In-Situ Fossil Recovery Wells. September 1999. EPA /816-R-014m.