

BNL (Enterprise), Inc

State 16 SWSE 3054

Cumulative Impacts Plan

Prepared for:
State of Colorado
Oil and Gas Conservation Commission

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1.0 INTRODUCTION

This Cumulative Impacts Plan has been prepared pursuant to Rule 304.c.(19) of the Colorado Oil and Gas Commission and addresses the following resources:

- Air Resources
- Public Health
- Water Resources
- Terrestrial and Aquatic Wildlife Resources and Ecosystems
- Soil Resources
- Public Welfare

This plan documents how the Operator (Confluence) will address cumulative impacts to resources identified pursuant to Rule 303.a.(5) that includes:

- A. A description of all resources for which cumulative adverse impacts are expected (Section 4.0);
- B. A description of specific measures taken to avoid or minimize the extent to which cumulative adverse impacts are increased (Section 5.0);
- C. A description of all measures taken to mitigate or offset cumulative adverse impacts to any of the resources (Section 6.0); and
- D. Additional information determined to be reasonable and necessary to the evaluation of cumulative impacts by the Operator, the Director, CDPHE, CPW, or the Relevant Local Government (Sections 1.0, 2.0, and 3.0).

The Cumulative Impacts Plan for the Confluence DJ, Inc. (Confluence) Bigfoot 11 location was prepared based on the information included in the preliminary Oil and Gas Location Assessment (Form 2A) and Cumulative Impacts Data Identification (Form 2B).

2.0 PROJECT DESCRIPTION

The BNL Enterprise State 16 SWSE 3054 Project (Project) includes the construction of one location for drilling, completion, and production of 1 (one) proposed well. The legal description for this project is SWSE of Section 16, Township 30 South, Range 54 West, 6th P.M., in Las Animas, Colorado.

2.1 SURFACE DISTURBANCE

Construction of the proposed location would result in an estimated 3.4 acres of short-term disturbance. After completion of approximately 1.2 acres of interim reclamation, long-term disturbance is 20.2 acres which includes upgrading an existing 2-track road. Residual disturbance includes acreage that would remain unvegetated for the life of the project, which is estimated to be 10 years. Within six months of operations, site reclamation would be initiated for portions of the well pad not required for the continued operation of the well, weather permitting.

3.0 CUMULATIVE IMPACT METHODOLOGY

Cumulative impacts may result when impacts associated with project implementation are added to other similar impacts associated with past, present and reasonably foreseeable future actions. The proposed Project is located in a rural portion of Las Animas County, Colorado that is associated with low residential density and dominated by open rangeland. Publically available data sources including county, state, federal, and public domains, were used to characterize the past, present, and reasonably foreseeable development in the vicinity of the proposed project. Based on COGCC data, there are zero oil and gas locations that are active and built within one mile.

Each resource addressed in this cumulative impacts analysis is assigned a spatial and temporal scale that establishes the extent of the analysis. The spatial component of this analysis is referred to as the “Cumulative Impact Analysis Area (CIAA). The CIAA varies by resource and can be relatively smaller for some resources, as for vegetation, or much larger as in the case for air quality. **Table 3-1** presents the geographic extent for each resource CIAA. The temporal boundary for most resources is the 10-year life of the project. For wildlife and vegetation that temporal boundary includes an additional 5 years toward achievement of agency-approved reclamation standards.

Table 3-1 Geographic Scope for Cumulative Impact Analysis

Resource	Cumulative Impact Analysis Area (CIAA)
Air Quality	1-mile radius
Public Health	1-mile radius
Water	½-mile radius
Terrestrial and Aquatic Wildlife Resources and Ecosystems	1-mile radius
Soils	Full extent of disturbance
Vegetation	1-mile radius
Public Welfare	1-mile radius

4.0 SUMMARY OF RESOURCE IMPACTS

4.1 AIR

4.1.1 Resource Description

There a variety of air emission sources at the State 16 SWSE 3054 location and within the CIAA including, vehicle traffic, houses, and oil and gas production sites. Implementation of the State 16 SWSE 3054 project would have a cumulative impact on air quality within the 1-mile CIAA. Demonstrated by the Emissions Inventory in Form 2B, the cumulative effects of the proposed project on air emissions in the CIAA would be minor. Direct and Indirect Impacts

During the air emissions analysis, it was determined indirect and direct impacts to from air emissions form vehicle traffic and production. The following impacts have been identified:

- Incremental contribution of vehicle emissions and dust from vehicles on the access road can lead to a decrease in air quality
- Incremental contribution of emissions from engines needed for the drilling operations and production stage operations can lead to a decrease in air quality.

- Short-term contribution of emissions from engines needed for the drilling operations can lead to a decrease in air quality
- Incremental contribution of emissions from engines needed for the production stage operations can lead to a decrease in air quality

4.1.2 Direct and Indirect Impacts

The highest potential concentrations of each HAP were used to evaluate both acute and chronic exposures. Acute exposure evaluations were based on the U.S. Environmental Protection Agency (USEPA) Acute Exposure Guideline Levels for Airborne Chemicals (AEGs) for commercial/industrial exposure. Acute residential exposures were evaluated against the Agency for Toxicity Substances and Disease Registry (ATSDR) Minimal Risk Levels (MRLs) for acute duration exposures. Chronic exposure levels were evaluated using calculations obtained from the USEPA Regional Screening Level tables.

Based on the airborne HAP concentrations estimated using HAP emission rates and the box model methodology, no HAP is expected to exceed the target cancer risk or noncancer hazard index for chronic duration exposures. Additionally, no HAPs exceed the residential or industrial screening levels for acute duration exposures within the well pad location during pre-production or production. Based on these results, HAP emissions are not expected to contribute to acute or chronic risks to human health within or beyond the well pad location.

4.1.3 Cumulative Impacts

Impacts to air resources would be minimized and mitigated by the measures described in Sections 5 and 6 of this Plan. Emissions would be permitted and regulated by the Colorado Department of Public Health and Environment, Air Pollution Control Division, and would be subject to appropriate controls to reduce emissions to minimal levels. Based on the minor level of emissions expected to be released as the result of implementation of this proposed project, this contribution to past, present, and reasonably foreseeable projects represents a cumulative increase to emissions in the air resources in the CIAA.

4.2 PUBLIC HEALTH

As described in Form 2b, The Public Health section refers to emissions of different HAPs that may be emitted from equipment and activities during drilling and/or completions operations on the Oil and Gas Location. The discussion of emissions and HAPs is addressed in the Air Resources section, above.

4.3 WATER RESOURCES

4.3.1 Resource Description

There are no water bodies (i.e., ponds, streams, rivers) in areas proposed for disturbance. There are no drainages included within areas proposed for disturbance. Within one mile of the working pad surface, there are four (4) unnamed intermittent ponds and several intermittent drainages. USFWS National Wetland Inventory data classifies each of these intermittent ponds as palustrine, unconsolidated shore, temporary flooded (PUSA). These ponds are expected to be dry during most

times of the year. There are no known public water systems within one mile of the working pad surface.

4.3.2 Direct and Indirect Impacts

Construction and operation of the proposed project could potentially impact water resources that exist within ½-mile of the proposed facilities based on the potential for increases in localized erosion and sedimentation rates. Implementation of the proposed Project could temporarily increase soil compaction on nearby existing roads, and on the proposed well pad. As a result of the localized increases in soil compaction, there is the likelihood that surface runoff would be increased and would be higher than in undisturbed areas near the proposed project. Based on the lack of substantial pathways (surface drainages) near the proposed project and with the successful implementation of project-related soil erosion control measures, there is low likelihood of substantial sedimentation of intermittent drainages in the area.

4.3.3 Cumulative Impacts

Construction and production activities at the proposed Project site combined with other past, present, and reasonably foreseeable activities in the area could increase the possibility for accidental releases of industrial products, including fuels, lubricants, and other petroleum products. Such accidental releases could impact local groundwater resources, if releases are of sufficient magnitude. There will be no permanent production facilities or storage of liquids on location. Successful implementation of project-related best practices and mitigation measures will result in negligible cumulative impacts to local water resources.

Water would be obtained from existing, permitted sources of surface water, including an estimated 1,500 bbls of surface water. Use of an estimated 1,500 bbls of total estimated water volume would cumulatively contribute to other water uses in the area.

4.4 TERRESTRIAL ECOSYSTEM AND WILDLIFE RESOURCES

4.4.1 Resource Description

The habitats within the proposed Project area are characterized as native and mostly undisturbed. The dominant vegetation community at the proposed location is herbaceous, including grasses and herbaceous plants. No sensitive habitat or wildlife areas are mapped within the proposed Project location. Colorado Parks and Wildlife (CPW) reviewed the development area prior to submittal as part of the leasing process with Colorado State Land Board. CPW indicated possible habitat for Mountain Plover, Swift Fox and Burrowing Owls. BNL had a wildlife biologist do a field visit and verified the disturbance area is not suitable for those species. Pioneer Environmental Consultants performed a United States Fish and Wildlife Services Information for Planning and Consultation (IPaC). Results indicate the potential for two endangered species to occur, including the Canada lynx (Threatened) and New Mexico meadow jumping mouse (Endangered). Based on review of aerial imagery, there is no suitable habitat for either of these species in the area proposed for disturbance or within the one-mile buffer around the proposed Location. There are no critical habitats in areas proposed for disturbance or within the one-mile buffer of the proposed Location.

4.4.2 Direct and Indirect Impacts

Implementation of the proposed project could result in direct and indirect impacts to wildlife. Direct impacts are those that result in mortality, injury, and behavioral changes (for example:

displacement) to wildlife. Direct impacts to wildlife typically occur during construction when wildlife are unable to avoid operating construction equipment and other project-related vehicles. Wildlife may be injured or killed during surface disturbing activities. Surface disturbing activities, including increases in human presence and associated noise, have the potential to displace wildlife from the Project location. Such displacement is expected to have minimal impact on individuals based on the availability and suitability of other habitats in the area. During the construction and drilling phases of the project, new light sources may be created. New light sources have the potential to attract insects which in turn may attract foraging bat and bird species. There is a potential for injury or mortality to birds and bats through collision with project-related infrastructure. Based on the low intensity of the impacts, relatively small area, and the limited duration of the construction project, direct impacts to wildlife are expected to be negligible. Indirect impacts to wildlife typically include habitat loss of 3.4 acres during construction, drilling and testing and then 1.2 acres during interim reclamation, changes in local habitats based on the introduction of noxious weeds, and project-related increases in predator densities or concentrations. Indirect impacts to wildlife species are expected to be minimal; based on the low diversity and quality of the impacted habitats and the availability of other undisturbed and suitable habitats in the vicinity.

4.4.3 Cumulative Impacts

Implementation of the proposed Project would have a minor cumulative impact on locally occurring wildlife and wildlife habitats. This determination is based on the relatively small size of the proposed project, the limited duration and intensity of potential impacts and the availability and suitability of other non-impacted wildlife habitats in the area. Implementation of the proposed project would not result in cumulative impacts on High Priority Habitats (HPH) because none exist in areas proposed for disturbance. The nearest HPH to the working pad surface is more than 6 miles to the southeast.

4.5 SOIL RESOURCES

4.5.1 Resource Description

Soils in the proposed Project location are described as Wiley silt loam (WeB), 0 to 3 percent slopes (3.3 acres); and Dalerose-rock outcrop (DaE), 3 to 25 percent slopes (0.1 acres).

4.5.2 Direct and Indirect Impacts

Implementation of the proposed project, including surface disturbing activities, could result in soil compaction, and increased erosion and sedimentation. Compaction of soils can lead to decreases in water and air absorption. Severe compaction can also lead to a conversion from aerobic to anaerobic soil conditions, thereby altering organisms in the soil and subsequently causing changes in soil nutrient cycling.

4.5.3 Cumulative Impacts

Implementation of the proposed project will have a negligible cumulative impact on soil resources in the area. Past, present, and reasonably foreseeable projects and activities in the area have likely resulted in similar impacts to soil resources.

4.6 PUBLIC WELFARE

4.6.1 Noise

Resource Description

The proposed project is located in rural Las Animas County. There are no known residential building units (RBUs) within 5,280 feet of the working pad surface. There are no high occupancy building units (HOBUs, including school and daycares) within 5,280 feet of the proposed working pad surface.

Direct and Indirect Impacts

Based on the lack of human noise receptors in the vicinity of the proposed project combined with project-related mitigation measures to reduce and minimize noise production, direct and indirect impacts are expected to be minimal.

Cumulative Impacts

No substantial cumulative noise impacts are expected.

4.6.2 Odor

Resource Description

There are no other known industrial, oil and gas, or other activities within one mile of the proposed project that would be potential sources of odors. There are no known human receptors within one mile of the proposed project, including the absence of residential building units and high occupancy building units.

Direct and Indirect Impacts

Implementation of the proposed project has the possibility of creating short-term and temporary changes to odors in the vicinity of the project. Such impacts would primarily occur during drilling and be associated with machinery/generator exhaust and the use of industrial chemicals.

Cumulative Impacts

Implementation of the proposed project would result in short-term and temporary odor impacts within the ½ mile cumulative impacts analysis area. However, based on the lack of human receptors near the proposed Project, these potential impacts are expected to be negligible.

4.6.3 Light

Resource Description

The proposed location for Project is in a rural area of Las Animas County, where light sources are limited and dispersed in low densities.

Direct and Indirect Impacts

The greatest potential for light impacts would occur during the drilling phase of the proposed project. During the drilling phase, the appearance of a new light source may be perceivable to distant observers. There would be no permanent light sources on the working pad surface during operation of the proposed facilities. BNL is committed to daytime operations only when feasible. If feasible there will be no light impacts.

Cumulative Impacts

There would not be any long-term permanent light-related cumulative impacts associated with implementation of the proposed project.

4.6.4 Dust

Resources Description

BNL's development of the State 16 SWSE 3054 wellpad ("Location") requires earth disturbing activities and travel on unpaved roads which has the potential to produce fugitive dust emissions.

Direct and Indirect Impacts

The greatest potential for impacts from dust is from construction of the Location as well as from traffic entering and leaving the Location. Air drilling will most likely be used which can contribute to incremental dust impacts.

Cumulative Impacts

There would not be any long-term permanent dust-related cumulative impacts associated with implementation of the proposed project.

5.0 MINIMIZATION MEASURES

In § 34-60-106 (2.5), C.R.S., the COGCC defines "minimizing adverse impacts" as

"providing necessary and reasonable protections to reduce the extent, severity, significance, or duration of an unavoidable direct, indirect, and cumulative adverse impacts to public health, safety, welfare, the environment, or wildlife resources from oil and gas operations."

Minimization measures reduce impacts to the greatest degree that is practical and can include operational and mechanical controls. Confluence has committed to the minimization measures listed in the following sections. Air Quality

- Measures associated with fugitive dust include:
 - Enterprise will use a 130 mil rig liner during the drilling and testing of the well. No soil will be disturbed during this time. The rig mat will eliminate fugitive dust from the wellpad.
 - Utilize existing vegetation, trees slash or brush piles to cover disturbed areas not used for vehicle traffic.
 - Application of fresh water during dry season.
 - Applications of approved chemicals may be applied to areas not needed for traffic to form a less erodible soil.
 - Operations will be confined to the wellpad working surface.
 - Continuous monitoring of disturbed areas to evaluate additional BMPs needed.
 - Fresh water application to disturbed areas during construction.

- Fresh water or magnesium chloride application to graveled surfaced of the Location and associated roads.
- Speed limit signs will be posted per surface owner agreement.
- Contractors will be notified of speed limits if no signs are posted.
- Regular road maintenance such as grading and adding additional gravel as needed.
- A Leak Detection and Repair Program will be implemented. This will include monthly inspections using infrared cameras.
- There will be no emission-producing reserve pits.

5.1 PUBLIC HEALTH

- No additional mitigation measures are required. This is based on the HAP modeling results that indicate no HAP is expected to exceed the target cancer risk or noncancer hazard index for chronic duration exposures. No HAPS exceed the residential or industrial screening levels for acute duration exposures within the well pad location during pre-production or production phases.

5.2 WATER RESOURCES

- A Stormwater Management Plan will be prepared. This plan will guide site-specific efforts to protect Waters of the State that could receive stormwater runoff from the proposed location.
- There will be no staging, refueling, or chemical storage areas on location.
- Potential pollutants located onsite will be sealed, wrapped, covered when not in use so as to eliminate or minimize contact with stormwater runoff.
- Proper storage, safe-handling, good housekeeping and spill prevention practices will be use to prevent pollutants from leaving the site.
- During construction, disturbed slopes will be covered with coconut blankets, straw mulch, or straw waddles and maintained for the life of the project or until slopes are stabilized and revegetated.
- With appropriate landowner authorization, baseline water quality samples will be collected from agency-approved water wells in the vicinity of the proposed oil and gas location.

5.3 TERRESTRIAL ECOSYSTEMS AND WILDLIFE RESOURCES

- Project employees and contractors will be informed and educated on wildlife conservation practices, including no harassment or feeding of wildlife.
- Proposed site facilities (for example, collection and distribution facilities) will be consolidated and centralized in an effort to minimize impact to wildlife habitats.
- Fugitive dust control measures will be implemented.
- Screens and other nesting barriers will be installed on stacks, heater treater openings, and fired vessels to prevent nesting by migratory bird species.

5.4 SOIL RESOURCES

- Topsoil and Stormwater management plans will be prepared for the proposed site and will include measures that will avoid and minimize impacts to soil resources. Some of these measures include the following:
 - Topsoil will be stripped from the disturbance area and will be stored onsite for future use.
 - Topsoil stockpiles will be protected from wind and water erosion.
 - Weed management practices will be used to prevent weed establishment on the topsoil stockpile.
 - Installation of coconut blankets, straw mulch, or straw waddles, sediment basins, swales, and perimeter ditches will be used to prevent minimize erosion from disturbed areas.
 - Biweekly inspections by a third-party contractor of BMP integrity and effectiveness will be implemented. Deficiencies will be noted and submitted to the operator and addressed in a timely manner.
 - Construction activities will be curtailed during wet periods in an effort to avoid unnecessary soil disturbance.
 - All roads will be recontoured and revegetated to a stable condition, unless the landowner directs differently.
 - Cut and fill areas will be regraded to match pre-project contours, to the extent possible.
- The topsoil stockpile will be graded to ensure all surface stability.
- Soils in areas associated with production operations or for subsequent drilling operations will be stabilized toward minimization of dust and erosion in these areas.
- A Spill Prevention, Control, and Countermeasure Plan will be prepared and implemented toward protecting soils from spills and releases.

5.5 PUBLIC WELFARE – NOISE, ODOR, AND LIGHT

Public Welfare

- Equipment, including welding trucks, will be equipped with fire extinguishers and spark arresters.
- Where public exposure to pipeline corridors is possible, warning signs will be installed to inform the public of the presence of the pipeline.
- Vehicle operators will be instructed to travel at low speeds and to stay on existing public roadways, project-related travel routes, and the well pad at all times.
- Vehicle trips to the location will be reduced through the use of technologies that allow for remote monitoring of the wells (for example, SCADA).
- A Transportation Plan will be developed and implemented. This plan will guide management of transportation related issues during implementation of the project.

Noise

- Daylight only operations will be conducted when possible.

Odor

- Oil and gas operations will be in compliance with the Department of Public Health and Environment, Air Quality Control Commission, Regulation No. 2 Odor Emission, 5 C.C.R. 1001-4, Regulation No. 3 (5 C.C.R. 1001-5), and Regulation No. 7 Section XVII.B.1 (a-c) and Section X11.
- A freshwater mud system will be used for surface hole.
- Drill pipe will be wiped to remove residual mud upon tripping out of the hole.

Light

- BMPs to minimize light pollution could include:
 - Daylight only operations will be conducted when possible

6.0 MITIGATION MEASURES

COGCC defines “mitigating adverse impacts” as:

“measures that compensate for unavoidable direct, indirect, and cumulative adverse impacts and loss of such resources from oil and operations”.

Mitigation measures are used to offset the intensity or severity of impacts and can include compensatory actions and administrative controls. The following mitigation measures for resources based on the cumulative impact analysis described in this Plan will be implemented.

6.1 AIR QUALITY

Minimization measures described in the previous section will address potential impacts associated air resources in the CIAA. No additional mitigation measures for air quality are included.

6.2 PUBLIC HEALTH

HAP emissions are not expected to contribute to acute or chronic risks to human health within or beyond the well pad location. No additional mitigation measures are required.

6.3 WATER RESOURCES

Minimization measures included in the site-specific SWMP combined with other measures listed in the previous section will address the potential for impacts to water resources in the CIAA. No other mitigation measures are required.

6.4 TERRESTRIAL ECOSYSTEMS AND WILDLIFE RESOURCES

- As part of final reclamation, all roads and pads will be recontoured and revegetated to a condition similar to pre-project conditions.
- For trenches, wildlife escape ramps will be installed every 0.25 mile.

6.5 SOIL RESOURCES

- Signs will be placed on each topsoil stockpile designating and preserving the material for reclamation purposes.