STATEMENT OF BASIS
CLASS IID PERMIT MODIFICATION
RESOLUTE NATURAL RESOURCES COMPANY

U.S. Environmental Protection Agency, Region IX (EPA)
Underground Injection Control (UIC) Permit NN207000002
Aneth Unit C-113 LDVL Class IID Injection Well
San Juan County, Utah
Lease Nos. SL 070968-A and SL 067907
API No. 4303731852

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BACKGROUND INFORMATION

Resolute Natural Resources Company ("Applicant") applied for and EPA issued a UIC permit effective December 6, 2007 to construct and operate a horizontal Class II disposal well for injection of saltwater produced from Aneth Unit oil wells. The vertical portion of the well is located on BLM land in Section 13 and, along with two of four lateral wellbores, is subject to the Utah Division of Oil Gas and Mining as the Underground Injection Control (UIC) permitting authority. The remaining two lateral wellbores are located partially under Navajo Nation surface trust land, in the south-half of Sections 12, Township 40 South, Range 23 East and the southwest quarter of Section 7, Township 40 South, Range 24 East in San Juan County, Utah, and are subject to EPA UIC permitting authority. The well is identified as the Aneth Unit C-113 LDVL.

The Permittee has applied to US EPA Region IX for a UIC major permit modification to increase the authorized average injection rate from 7,500 to 25,000 barrels per day on a monthly basis (775,000 barrels per month) and increase the maximum injection rate of 10,000 to 35,000 barrels per day on a daily basis. The authorized average injection rate shall be subject to the maximum allowable injection pressure of 3,800 psig and a maximum cumulative injected volume of 52,155,000 barrels (14,289 BWPD average) over the ten-year term of the permit. The average injection rate is projected to gradually decrease from an initial rate of 25,000 BWPD to 10,000

BWPD in 2012 and thereafter to the end of the ten-year term of the permit in December 2017, due to the decreasing capacity of the well and decreasing amounts of water produced in the Aneth Unit over that term. The cumulative injection volume injected shall not exceed 52,155,000 barrels without a further major modification of the permit, subject to public participation and comment on the permit action.

Resolute's application for the modification of the authorized injection rate is administratively complete and EPA has completed its technical review of the application. The EPA has decided to approve this major permit modification, pending public review and comment, and is now issuing a Draft Permit Modification. If approved, the permit modification will be issued for a term to coincide with the ten-year term of the original permit, unless the permit is terminated or modified for reasonable cause (40 CFR §§144.39, 144.40, and 144.41). The permit will be reviewed by EPA every five years.

The source of injection fluids is saltwater produced in association with oil and gas production from current and future Paradox Formation oil wells operated by Resolute in the Aneth Unit. The average total dissolved solids (TDS) content of injection fluids is approximately 91,000 ppm based on fluid analyses of water from the Aneth Unit water injection plant. The water will be injected into the Mississippian Leadville Formation at a depth of approximately 7,058 to 7,412 feet. The Leadville Formation waters contain TDS of approximately 44,000 ppm, based on the analysis of formation water produced from the Leadville Formation in the C-113 SWD well.

This Statement of Basis describes the permit modifications and the basis for those modifications under authority of the Underground Injection Control (UIC) regulations and the UIC provisions of the Safe Drinking Water Act.

BRIEF SUMMARY OF PART II. SPECIFIC PERMIT MODIFICATIONS

SECTION B. CORRECTIVE ACTION

A circular Area of Review (AOR) of 6.25 miles radius, measured from the surface location of the well, has been proposed by the Applicant. The radius is based on a computer simulation of the increase in reservoir pressure in the Leadville formation resulting from the injection of a cumulative volume of 52,155,000 barrels of produced water over the ten-year term of the permit. The zone of endangering influence is defined as the distance at which the reservoir pressure increase, after ten years of injection, will equal the difference in current hydrostatic pressure between the Navajo Aquifer and the underpressured Leadville formation (310 psig). The average initial reservoir pressure in the Leadville formation is 2850 psig, based on fall-off test results, and the initial hydrostatic pressure of the Navajo Aquifer at Leadville depth of 7300 feet is 3160 psig, assuming a normal fresh water gradient of 0.433 psi per foot.

The shape of the AOR is circular and somewhat larger than the ZEI determined when the sealing faults that penetrate the Leadville formation are included in the computer model. This assumption provides the most conservative approach to the determination of the ZEI and AOR and would more accurately represent the reservoir pressure behavior if the faults were non-sealing, which at this depth and age is not likely. The faults were located by means of interpretation of 3-D seismic data obtained in recent surveys conducted for Resolute. The faults terminate in the overlying impermeable salt layer within the Pennsylvanian interval, according to the seismic data and Resolute geologists, but since the faults are most probably sealed, they would not provide a pathway for fluid migration out of the injection zone and would restrict lateral migration within the Leadville formation. In the unlikely event that the faults are not sealed, injection fluids would likely not migrate through the salt beds located approximately 400 feet above the upper Leadville formation.

The applicant reports that there are twelve (12) wellbore penetrations of the Leadville Formation within the greatly expanded AOR of the subject well. Most of the required drilling and construction information was provided by the applicant and was reviewed by EPA to assess the risk of fluid movement into USDWs resulting from injection into the C-113 LDVL well. Much of the missing information was accessed and found in the Utah DOGM online database. We have determined that all of the wells were constructed and/or plugged abandoned in accordance with current UIC requirements or are otherwise protective of USDWs. Nine of the wells were plugged and abandoned and the active wells were plugged back to the Paradox Formation as producers or injectors. The Leadville Formation is isolated from USDWs in all of those wells by cement plugs. In addition, fluid movement will be restricted by the presence of sealing faults in the Leadville Formation located between the C-113 well and most of the other wells that penetrate the Leadville zone in the AOR. We therefore believe that there is minimal risk of endangerment to USDWs resulting from pressure increases and fluid movement into the wells that penetrate the injection zone in the AOR.

The permit will be issued based on corrective action considerations associated with the proposed AOR; however, the AOR will be subject to review and possible enlargement based on monitoring of static reservoir pressure. The extent of reservoir pressure buildup will be monitored annually during the term of the permit. Corrective actions will be required to minimize pressure buildup over the permit term if it may endanger USDWs.

SECTION C. WELL OPERATION

4. Injection Volume Limitation:

The proposed average injection rate is 25,000 barrels per day on a monthly basis (775,000 barrels) and the proposed maximum injection rate is 35,000 barrels per day on a daily basis. The average injection rate is expected to decline to 10,000 barrels per day after five years due

to reservoir pressure buildup and declining water production in the Aneth Unit over that period. The projected and authorized cumulative volume to be injected into the Leadville interval over the ten-year term of the permit equals 52.155 million barrels. The storage capacity of the Leadville injection zone within the proposed area of review (AOR) is an estimated 4,850 million barrels, based on Leadville Formation properties and injection zone thickness determined from wireline log analysis. The calculations are based on the following assumptions and formation properties: a homogeneous injection zone, average effective porosity of 10.3 %, residual water and gas saturation of 40%, and net thickness of 129 feet. The proposed AOR is based on the ZEI model and defined by a cylinder with a radius of 6.25 miles from the wellbore. Assuming a radial flow regime, the distance to the outer perimeter of the injectate plume would be approximately 3,420 feet, or 0.65 miles, which is well within the AOR boundary at 6.25 miles from the surface location of the well.