ATTACHMENT A

ATTACHMENT A: GENERAL FACILITY DESCRIPTION

A.1 SITE LOCATION

The HollyFrontier Navajo Refining Company LLC's (the Permittee) Artesia Refinery (Facility) is located east of the City of Artesia, New Mexico, near the intersection of United States Highway (US Hwy) 82 and US Hwy 285. The Facility is partially located within the city limits of the City of Artesia. The City of Artesia and the Facility are located within the Pecos River Valley of Eastern New Mexico. An inactive hazardous waste management unit (HWMU), Evaporation Ponds (EPs) 1 through 3, 5 and 6, is located approximately three miles east of the Facility in a bend of the Pecos River. The EPs are an inactive system of five surface impoundments historically used for discharge of Facility wastewater effluent. The Permittee also maintains operational control of the three injection wells permitted by OCD for disposal of nonhazardous Facility wastewater. The locations of the Facility, the EPs, and the injection wells are shown in Figure 5-1, Attachment I (Figures).

The areas to the north, south and east of the Facility are sparsely populated and used primarily for agricultural and ranching purposes. The primary business and residential areas of the City of Artesia are located to the west, southwest, and northwest of the Facility. There are a small number of commercial businesses located south of the Facility along US Hwy 82. Much of the property for one-half mile north to East Richey Avenue and east toward Bolton Road is owned by HollyFrontier Navajo Refining LLC, as shown in Figure 6-1 in Attachment I but is not part of the Facility. The Facility boundary is defined by the security fence that restricts access to the refinery property identified in Figure 5-2 Permit Attachment I. Much of the area east and northeast to Haldeman Road is a cultivated pecan orchard or used for other agricultural and ranching purposes. The land uses for areas surrounding the Facility are shown in Figures 6-1, 6-2, and 6-6 in Attachment I.

A.2 REGIONAL AND LOCAL GEOLOGY AND HYDROGEOLOGY

The Facility is located on the northwest shelf of the Permian Basin, in the Roswell Basin. In this region, the deposits are comprised of approximately 250 to 300 feet of Quaternary alluvium unconformably overlying approximately 2,000 feet of Permian clastic and carbonate rocks. These Permian deposits unconformably overlie Precambrian syenite, gneiss and diabase crystalline rocks. The Quaternary alluvium in the refinery area is predominantly comprised of clays, silts, sands, and gravels deposited in the Pecos River Valley. These "valley fill" deposits extend in a north-south belt approximately 20 miles wide, generally west of the Pecos River. The thickness of the valley fill varies from a thin veneer on the western margins of the Pecos River Valley to a maximum of 300 feet in depressions, one of which is located beneath the Facility.

The principal aquifers in the Artesia area are within the Quaternary or Valley Fill Alluvium and the San Andres Formation. The deeper carbonate aquifer in the San Andres Formation is referred to as the deep artesian aquifer, whereas the water-bearing zones of the shallower alluvial fill aquifer are referred to as the valley fill zone. In the vicinity of the Facility process area, a near-ground surface water-bearing zone has been encountered which is apparently limited in vertical extent and is shallow with respect to the surface, yet exhibits artesian properties at some monitoring wells. Beneath and adjacent to the Facility, the first water-bearing zone in the valley fill alluvium is referred to as the shallow saturated zone.

The Permian Artesia Group is comprised of five formations (from shallowest to deepest): the Tansill, Yates, Seven Rivers, Queen, and Grayburg Formations. The Tansill and Yates Formations outcrop at the surface east of the Pecos River and are not present in the vicinity of the Facility. The uppermost Permian formation in the Artesia area is the Seven Rivers Formation, which outcrops east of the Pecos River. This eastward-dipping formation is eroded and buried by the valley fill alluvium at a depth of 300 feet in the area between the river and the Facility. Nearer the Facility, the formation thins and disappears farther west. Where the formation is present, it consists of a sequence of evaporites, carbonates, gypsum, and shale with isolated sand and fractured anhydrite/gypsum lenses. An examination of available borehole logs by IT Corporation in the mid-1980s provided no indication that the Seven Rivers Formation has been encountered beneath the Facility. However, the lithologic logs of wells completed in the Facility area describe unconsolidated alluvial deposits from depths of about 20 feet to over 250 feet. In the area of the Facility, the Queen and Grayburg Formations have been mapped as a single unit by geologists as consisting of about 700 feet of interbedded dolomite and calcareous dolomite, gypsum, fine-grained sandstone, carbonates, siltstone and mudstone. In locations where the Seven Rivers Formation is absent, the upper portion of the Queen Formation acts as a confining bed between the deep artesian aquifer and the valley fill zone. The San Andres Formation lies beneath the Grayburg and Queen Formations and immediately above the Precambrian crystalline basement rocks. The San Andres Formation is composed mainly of limestone and dolomite containing irregularly and erratic solution cavities, which range up to several feet in diameter. Its thickness is greater than 700 feet. The upper portion of the formation is composed of oolitic dolomite with some anhydrite cement.

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The carbonate gravel unit described above is the uppermost unit of the Valley Fill Alluvium, and is referred to as the valley fill zone. Near the surface, groundwater is localized in thin discontinuous gravel beds typical of braided channel material deposited during flood events originating in the foothills and Sacramento Mountains to the west. Most lithologic logs located

immediately to the north and east of the Facility show considerable thicknesses of clays or clay mixtures, ranging from 20 to 160 feet. The intervals of occurrence differ from well to well, and thin zones of gravels are interspersed in the upper 100 feet. Production wells completed in the valley fill zone are typically screened across from one to five water-producing zones. Thicknesses of up to 170 feet have been reported for water-production zones, but most are less than 20 feet. Water-producing zones are principally sand and gravel separated by less permeable lenses of silt and clay. Due to the discontinuities in the clay lenses separating the shallow saturated zone from the valley fill zone, the two zones are hydraulically connected in some locations. In general, the potentiometric surface of wells completed in the valley fill zone is higher than that of wells completed in the shallow saturated zone, which would indicate an upward hydraulic gradient under normal conditions. The general hydraulic gradient direction and predominant groundwater flow direction in the valley fill zone follows the regional stratigraphic dip eastward toward the Pecos River, then southward subparallel to the river. Isopleths of the potentiometric surface of the valley fill zone can be found in the Facility's Annual Groundwater Monitoring Reports. Recharge of the valley fill zone is generally attributed to irrigation return flow from pumping in the deeper aquifers and from infiltration from the Pecos River. Monitoring wells completed in the valley fill zone near the Facility range from 40 to 60 feet below ground level and the formation yields water containing 500 to 1,500 ppm TDS.

The deep artesian aquifer is closely related to the Permian San Andres Limestone and generally consists of one or more water-producing zones of variable permeability located in the upper portion of the carbonate rocks. However, in the Artesia area, the producing interval rises stratigraphically and includes the lower sections of the overlying Grayburg and Queen Formations. Near the Facility, the depth to the top of the producing interval is estimated to be approximately 440 feet. The Seven Rivers Formation and the other members of the Artesia Group are generally considered confining beds of relatively low hydraulic conductivity. The deep artesian aquifer has been extensively developed for industrial, municipal, and agricultural use. The quality of water from this aquifer ranges from 500 ppm to more than 5,000 ppm TDS depending on location. In the Artesia area, water is generally derived from depths ranging from 850 to 1,250 feet below ground surface. The Sacramento Mountains to the west of Artesia are largely responsible for recharge to this deep aquifer. Available information for irrigation well RA-4798 indicates that it is screened at 840 to 850 feet below ground surface, in the deep artesian aquifer. Historic analytical data from irrigation well RA-4798 do not indicate the presence of hydrocarbon impacts from Facility operations. Thus, there is no indication that this unit is hydraulically connected with the shallow saturated zone or the valley fill zone beneath the Facility.

A.3 SITE BACKGROUND

The main part of the Artesia Refinery, located at 501 East Main Street Artesia, New Mexico, occupies approximately 466 acres. The facility has been in operation since the mid-1920s when oil wells were first drilled in southeastern New Mexico. The Artesia field began production in April 1924 and subsequently, other significant fields in the region were developed and produced. In response to the increase in local commercial oil production, refineries were built in the region.

The first refinery within the current Artesia Refinery property is the original North Plant, north of Eagle Draw and east of the Artesia-Roswell highway (now US Hwy 285). Illinois Oil

Producers, Company and Continental Oil Company (Conoco) began construction on this plant in early September 1925 and operations began on December 18, 1925 (*Roswell Daily Record* 1925a, 1925b). This 1,000 barrels (bbl) per day (BPD) refinery, which initially made low-octane gasoline and kerosene, was significantly expanded following Conoco's acquisition of the plant in 1931 (City of Artesia 2012: p. 7; Dunn and Florez 2011: p. 70).

A separate and independently operated "topping" refinery was constructed by the Maljamar Oil and Gas Company between mid-July and early August 1931 and was located on the south side of this original North Plant (*Roswell Daily Record* 1931). This "Malco" plant initially had a crude oil processing capacity of 1,500 to 1,800 BPD, which was increased to 2,000 BPD in 1932 (*Albuquerque Journal* 1938). In 1936, Malco built a separate 1,000 BPD "Dubbs cracking plant" at this location to produce Rayo and Malco Supreme gasoline (Ibid.).

In 1939, the Nu-Mex Asphalt and Refining Company constructed a refinery and asphalt plant on the Artesia-Lovington Highway (now East Main Street/US Hwy 82), which was renamed and rebuilt by new owners in 1941 as a 1,800 BPD crude and asphalt refinery (HollyFrontier 2011). By the early 1950s, this plant made gasoline, kerosene, naphtha, burning oils, heating oils, and lubricating oils (New Mexico Asphalt & Refining Company 1950). The owner of the Malco plant at this time, Robert O. Anderson, purchased this East Main Street plant in 1953 (which also then became known as the "Malco" plant) and converted the operations from heavy oil processing to asphalt manufacturing to supply road-paving material to the state department of transportation (Dunn and Florez 2011: p. 71).

In May 1959, Anderson sold the plant along the Artesia-Roswell Highway (the topping plant and tankage from the original 1925 plant that remained after demolition of the rest of the plant) to Conoco. At the same time, he leased the Malco plant on the Artesia-Lovington Highway to Conoco, with an option to purchase. Conoco then operationally integrated their two refineries through interconnecting pipelines to achieve a 16,000 BPD plant. Due to a US Department of Justice (DOJ) antitrust suit, in 1968, the US Supreme Court ordered Conoco to divest the refinery at Artesia, New Mexico, within a year. On May 21, 1969, Conoco secured approval from a New Mexico federal district court to sell its interests in the refinery, crude oil gathering lines, product pipelines, and El Paso and Ysleta terminals to a newly formed partnership, Navajo Refining Company (*The Odessa American* 1969). The $12 million transaction was completed around June 1, 1969 (*Albuquerque Journal* 1969).

The Navajo partners were C. L. Norsworthy, Jr. of Dallas, Texas, and the Holly Corporation, then of Azusa, California. Norsworthy eventually sold his interest to Holly Corporation. In summary, the current Facility complex, which is owned by Navajo, a subsidiary of the HollyFrontier Corporation, began as several operationally independent plants first constructed between 1925 and 1941. Currently, the Facility has the capacity to process approximately 100,000 BPD of crude oil and processes crude oil into asphalt, fuel oil, gasoline, diesel, jet fuel, and liquefied petroleum gas.

A.4 RCRA PERMITTED UNITS

Three inactive HWMUs are located at the Facility: the North Colony Landfarm (NCL); the Tetraethyl Lead (TEL) Site; and Evaporation Ponds (EPs) 1 through 6.

A.4.a North Colony Landfarm (NCL)

From May 1980 to September 1990, hazardous wastes generated by the Facility were applied to an approximately four acre landfarm, known as the North Colony Landfarm (NCL). The NCL is located in the northwest corner of the Facility as shown in Figure 5-2 of Attachment I. Previously, the site had been a Conoco company housing colony located just north of a tank farm which dated to the original Facility (NRC, 2001: p. B-5). An estimated 55,000 gallons of listed RCRA wastes (K048, K049, K051 and K052) were applied to the NCL while it was active (Ibid.). In 2005, Tank 815 was constructed on the NCL. Tank 815 has a capacity of 80,000 bbls and is currently used to store ultra-low sulfur diesel (ULSD) fuel. Tank 815 is located on the eastern half of the NCL and is surrounded by earthen berms that provide secondary containment for the tank. The closure of the NCL was certified on January 30, 2010. A Permit Modification Request including the *Revised NCL Closure/Post-Closure Plan* updated to address the construction of Tank 815 was approved in December 2010. The *Revised NCL Closure/Post-Closure Plan* is currently being implemented.

A.4.b. Tetraethyl Lead (TEL) Site

The 0.9 acre TEL Site was used to treat oily wastes and other hazardous materials. Sometimes referred to as the "Tetraethyl Lead Weathering Area," the site name was derived from its use at one time for weathering of pipe and other materials that had been in tetraethyl lead service. This use was with the State's concurrence and these materials were removed from the TEL Site after weathering, not buried or otherwise disposed of at the site. Approximately 12.4 tons of slop oil emulsion solids (K049), API separator sludges (K051), and leaded tank bottoms (K052) wastes were managed at this unit. The TEL Site is located near the northeast corner of the Facility, south of Eagle Creek. The unit was capped and closed under a NMED-approved Closure/Post-Closure Plan in 1988 to 1989. The closure was certified in February 1989, with final NMED approval in June 1989. The approved *TetraEthyl Lead (TEL) Weathering Area Post-Closure Plan* is currently being implemented.

A.4.c Evaporation Ponds (EPs)

The Permittee used solar evaporation ponds, located approximately three miles east of the main facility in a bend of the Pecos River, to manage the Facility's wastewater beginning in the early 1930s. The USEPA promulgated the hazardous waste land disposal standards applicable to hazardous waste landfills, surface impoundments, waste piles, and land treatment facilities (47 FR 32357, July 26, 1982). EP1 was constructed in the 1930s and taken out of service in 1987 when the open conveyance ditch (TMD) was filled in and replaced with a closed pipeline. EP1 underwent periodic turning and discing of the soils in the late 1990s to promote natural biodegradation of organic constituents. After 1987, the active pond system consisted of EP2 (constructed in 1966), EP3 (constructed in 1974), EP5 (constructed in 1984) and EP6 (constructed in 1988); EP4 was never constructed. When EP1 was taken out of service in 1987, the effluent from the newly constructed pipeline was routed to EP2 and subsequently to EP5; EP1 had a surface area of approximately 16 acres and EPs 2 through 6 had a total area of approximately 91 acres. EPs 2 through 6 were taken out of service and allowed to dry beginning

in September 1999 with the completion of upgrades to the wastewater treatment system and permitting of Class I injection wells.

In 1993, EPs 2 through 6 received discharges of wastewater hazardous for benzene (D018). This event triggered USEPA and USDOJ enforcement activities. As part of a Consent Decree finalized in late 1998, the Permittee agreed to construct additional wastewater treatment and disposal facilities and discontinue using the evaporation ponds as soon as practicable following construction and startup of the new facilities. The ponds received treated process water until September 1999, when construction of additional wastewater treatment system units and permitting of injection wells were completed in accordance with the Consent Decree finalized with USEPA and NMED. Since that time, the ponds have been inactive and are now completely dry. EPs 2 through 6 are currently in closure and are undergoing investigation as part of the Permittee's Corrective Action Program (CAP). EP1 was not a part of the original enforcement action at the Evaporation Ponds; however, the Consent Decree has since been terminated and the Permittee has not been demonstrated that EP1 did not receive hazardous waste after July 26, 1982; therefore, it is considered part of the HWMU.

A.5 WASTEWATER MANAGEMENT

The Facility treats process wastewater in various wastewater treatment units at the refinery. The wastewater treatment system at the Facility consists of primary and secondary oil/water/solids separation (gravitational and air flotation), equalization, and tertiary aggressive biological treatment. Oil that is recovered from the wastewater treatment system American Petroleum Institute (API) separator is diverted to the Slop Oil Tank. The contents of the Slop Oil Tank are returned to the refining process. In 1994, the Permittee negotiated an agreement with the City of Artesia Publicly Owned Treatment Works (POTW) to discharge treated effluent water to the City of Artesia POTW and installed a pipeline to enable this water to be pumped to the POTW. This agreement was revised in 1999 to its current form and extended in 2011. Currently, the Permittee is authorized to discharge up to 150 gallons per minute (216,000 gallons per day) of treated wastewater to the POTW. The wastewater treatment system is operated in batches to prevent releases of treated wastewater with benzene concentrations greater than 0.399 mg/L. Treated wastewater that is not sent to the POTW is pumped via pipeline to permitted deep injection wells for disposal. The deep injection wells are permitted by the New Mexico Oil Conservation Division (OCD) as Class I (non-hazardous) injection wells.

A.6 OTHER RCRA ACTIVITIES

The Permittee is a large quantity generator (LQG) of hazardous wastes and currently manages hazardous wastes in less than 90-day storage areas. The Permittee meets the definition of a small quantity handler of universal waste in 40 CFR § 273.9 and is subject to the requirements of 40 CFR § 273 Subpart B and 20.4.1.1001 NMAC.

A.6.a Less Than 90 Day Storage Areas

Three permanent less than 90-day storage areas are located at the Facility to temporarily store hazardous wastes for a period of time not to exceed 90 days. These areas are operated according to 40 CFR § 262.34(a). Additional areas may be designated and used on a temporary and as-needed basis. Designation of temporary less than 90-day storage areas typically occurs during scheduled maintenance activities and turnarounds, when activities may necessitate the use of one

of these types of waste management and accumulation areas. The following areas are designated as permanent less than 90-day storage areas:

(1) North Bundle Cleaning Pad (SWMU 20);

(2) South Bundle Cleaning Pad (SWMU 21); and

(3) The "Haz Pad," also known as the "Roll Off Bin Staging Area," "Bin Pad," or the "East Pad."

The locations of the permanent less than 90-day storage areas are shown in Attachment I.

A.6.b Universal Waste Management

The Permittee manages universal waste streams in accordance with 40 CFR § 273 as amended by 20.4.1.1001 NMAC, which specifies aerosol cans containing hazardous waste as a universal waste stream.

Universal waste batteries are stored within plastic drums located in the old Blender warehouse. Universal waste lamps and mercury-containing equipment are stored in boxes on shelves dedicated for universal waste storage within the old Blender warehouse. An outside waste disposal contractor disposes of universal waste batteries, lamps, and mercury-containing equipment on an as-needed basis. The location of the Blender Warehouse is shown in Attachment I.

Universal waste aerosol cans are accumulated in small drums located in multiple locations around the Facility. Maintenance personnel periodically collect aerosol cans from the accumulation drums and transport them to can puncturing units located at various locations around the Facility to depressurize and empty the cans into a United States Department of Transportation (USDOT) shipping drum. The punctured cans are then recycled as scrap metal.

A.7 References

Roswell Daily News. September 1, 1925 (1925a). "1000 Barrel Refinery To Go To Artesia," p. 5.

Roswell Daily News. December 19, 1925 (1925b). "Big Things Happening in Artesia Oil Field; A Great Future Ahead," p. 1.

Roswell Daily News. July 14, 1931. "New Refinery," p.7.

Albuquerque Journal. October 2, 1938. Malco Refineries, Inc. advertisement "New Mexico's Finest Petroleum Products. . . ," p. 5.

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Albuquerque Journal. June 4, 1969. "Artesia Refinery Cost $12 Million," p. B-8.

Navajo Refining Company. June 2001. RCRA Post-Closure Permit Application for the Navajo

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