

MEMO

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Date:

January 19, 2016

Arcadis Project No.:

B0014505

Subject:

Aberdeen MGP Site Environmental Remediation Program: 2016-2020
Projected Cash Flow

This memorandum presents an update on the progress of remediation activities at NorthWestern Energy's former manufactured gas plant site in Aberdeen, South Dakota, along with estimated environmental remediation expenditures over the next five years. The approach for site management, approved by the South Dakota Department of Environment and Resources (SD DENR) in June 2010, consists of enacting institutional controls restricting property development and groundwater use, recovery of coal tar free product from the subsurface, long-term perimeter groundwater monitoring, and ongoing operational maintenance on current and future groundwater/free product remediation systems.

Last year NorthWestern Energy and Arcadis continued the extraction of coal tar free product from several on-site collection galleries and on-site and off-site recovery wells. Over 4,500 gallons of coal tar have been recovered during the four years that the collection systems have been in place. While this is a significant volume, it is less than initial recovery estimates, leading to a 2015 performance analysis to better understand the potential for further coal tar recovery in other off-site areas. The remedial construction activities targeted for 2015 were pushed back to allow for a thorough evaluation of the performance of the existing recovery systems.

Arcadis conducted a coal tar drainability/mobility analysis in 2015 to identify subsurface settings from which coal tar may not be drainable and recoverable. In doing so, this would lead to a more "surgical" approach to recovering isolated coal tar bodies rather than large-scale collection galleries as have currently been deployed. The analysis supports a finding that a significant volume of the coal tar free product is immobile and not drainable, and for the off-site impacted areas remaining to be addressed, this

information will support a modified design approach. NorthWestern Energy and Arcadis presented these findings to SDDENR in October 2015 and, while no official agreement has been obtained regarding the mobility assessment, based on the meeting with regulatory staff it appears likely that the overall plan for remedial construction will change accordingly.

The cost assumptions used to develop this estimate were initially prepared as part of a Remedial Alternative Evaluation intended to provide an engineering-level cost comparison between various alternatives that were being considered in 2010. For purposes of this cash flow analysis we are assuming a slightly smaller-scale approach to the off-site properties with implementation being spread out over multiple construction efforts as access is obtained to various sites. The anticipated schedule and projected cash flow for the next five years are outlined in the table below. This includes an established budgetary amount of \$1,000,000 for third party property owner compensation, if necessary (representing the high-end values for each year). This amount is assumed to cover potential third-party properties that are north, east, and south of the property and is split up accordingly over three years as these properties are sequentially addressed. Third party compensation is assumed to not be required for city properties west and north of the site, though recovery efforts will likely be required in those areas. As the remedial construction program now begins to target off-site areas, the schedule and costs will be more susceptible to third party negotiations regarding access, timing, and any impacts to property owners and the local community. As such, actual costs will likely differ once regulatory meetings are convened, designs are developed and finalized, contractor bids are received and evaluated, and third party negotiations take place. The forecasted expenditures outlined below are a best estimate based on the assumptions discussed herein at this time.

In addition to the planned remedial construction activities, supplemental delineation of coal tar and dissolved-phase groundwater impacts will be required south of the site near a third-party residential (apartment) property, where field work in 2015 documented additional impacts nearby. The cost estimate was increased slightly to account for anticipated site characterization and well installation costs for this area, which will likely include free product field-screening and soil gas surveys. Remedial construction is expected to be completed in 2019, and annual costs in 2020 will consist of O&M and monitoring of the in-place systems. Annual expenditures are expected to be approximately \$600k-\$800k in 2020 and remain stable or gradually decrease in forthcoming years.

ABERDEEN MGP SITE FORECASTED REMEDIATION PROGRAM		
Year	Projected Expenditures	Anticipated Project Activities and Related Assumptions
2016	\$1.1-1.5M	Remedial design and construction in western offsite area, operation and maintenance costs for existing Booster Station remediation system continued O&M for onsite remediation systems, supplemental delineation of free product north and south of site, installation of up to four additional offsite monitoring wells and annual groundwater monitoring. Possibility of 33% of third-party property compensation for high-end estimate.

2017	\$1.5-1.8M	Remedial design and construction in northern offsite area, operation and maintenance costs for existing Booster Station remediation system and annual groundwater monitoring. Initial O&M on offsite remediation systems (western offsite area) and continued O&M for onsite remediation systems. Possibility of 33% of third-party property compensation for high-end estimate.
2018	\$1.5-1.8M	Remedial design and construction in southern offsite area, O&M for existing Booster Station remediation system and onsite collection systems and annual groundwater monitoring. Additional O&M for western and northern offsite remediation systems. Possibility of 33% of third-party property compensation for high-end estimate.
2019	\$1.5M	Remedial design and construction in eastern offsite area, O&M of Booster Station remediation system and onsite collection systems, and annual groundwater monitoring. Additional O&M for northern/southern/western offsite remediation systems. Remedial construction expected to be completed for all areas in 2019.
2020	\$800K	O&M of Booster Station remediation system, onsite collection systems, additional O&M for northern/southern/western offsite collection systems, and annual groundwater monitoring.

5-Year Subtotal for 2016-2020: \$6.3-7.4M

Non-discounted liability value identified in December 2015 reserve update: \$12.9M