6. CUMULATIVE EFFECTS

This section discusses potential impacts resulting from other facilities, operations, and activities that in combination with potential impacts from the proposed project may contribute to cumulative impacts. Cumulative impacts are impacts on the environment that result from the incremental impact of the proposed project when added to other past, present, and reasonably foreseeable future actions regardless of the agency (federal or non-federal) or person that undertakes such other actions (40 CFR 1508.7). An inherent part of the cumulative effects analysis is the uncertainty surrounding actions that have not yet been fully developed. The CEQ regulations provide for the inclusion of uncertainties in the EIS analysis, and state that "(w)hen an agency is evaluating reasonably foreseeable significant adverse effects on the human environment in an EIS and there is incomplete or unavailable information, the agency shall always make clear that such information is lacking" (40 CFR 1502.22). The CEQ regulations do not say that the analysis cannot be performed if the information is lacking. Consequently, the analysis contained in this section includes what could be reasonably anticipated to occur given the uncertainty created by the lack of detailed investigations to support all cause and effect linkages that may be associated with the proposed project, and the indirect effects related to construction and long-term operation of the facilities.

Because cumulative impacts accrue to resources, the analysis of impacts must focus on specific resources or impact areas as opposed to merely aggregating all of the actions occurring in and around the proposed facilities and attempting to form some conclusions regarding the effects of the many unrelated actions. Narrowing the scope of the analysis to resources where there is a likelihood of reasonably foreseeable impacts accruing supports the intent of the NEPA process, which is "to reduce paperwork and the accumulation of extraneous background data; and to emphasize real environmental issues and alternatives" [40 CFR 1500.2(b)]. The resources and impact areas that were identified with a likelihood of such impacts are (1) ***air quality, including hazardous air pollutants and*** greenhouse gases, including CO_2 emissions contributing to global climate change, (2) water resources and related issues, such as water consumption and water quality, and (3) socioeconomic resources and related issues, such as ***the flow and safety of vehicular traffic and the effects on*** water and wastewater services. The lack of impacts to other resources directly ***or indirectly*** affected by the proposed project precludes other resources from this cumulative effects analysis.

Each resource analyzed has an individual spatial (geographic) boundary, although the temporal ***boundary*** (time frame) can generally be assumed to equal the ***50***-year life expectancy of the proposed facilities. ***For air quality, a radius of 30 miles from the proposed facilities was used for the spatial boundary.*** For greenhouse gases, including CO_2 emissions, a global spatial boundary was used in the analysis; for water ***quantity***, the Susquehanna River watershed was used as the spatial boundary; ***for water quality, the Mahanoy Creek watershed was used;*** and for socioeconomic resources, Schuylkill County was used.

6.1 Air Quality

6.1.1 Multiple Air Pollutant Sources

For air quality, although the analysis in Section 4.1.2.2 indicated that maximum predicted concentrations would be less than the significant impact levels, an additional analysis was performed to evaluate potential cumulative impacts. The analysis consisted of modeling six existing sources in addition to the proposed facilities, and included background concentrations (which incorporate other existing sources in the atmosphere that have not been modeled). Modeled sources included the proposed coal-to-oil facilities and six existing power plants (Gilberton, Schuylkill, Wheelabrator, Northeastern, Mt. Carmel, and Panther Creek). (See Figure 3.1.1). The analysis used the same approach and assumptions that have been described in Section 4.1.2.2. The proposed and planned developments discussed in Section 6.3 were not included in this analysis. Because of the nature of the activities carried out there (regional distribution centers and wind farms), their potential air pollutant emissions, including vehicle emissions from increased traffic, are expected to be small in comparison to the proposed facilities, existing power plants, and regulatory thresholds typically used to determine whether further air quality impact analysis is necessary [such as 40 CFR 93.153(b)]. The proposed biofuels production plant described later in this section has not yet been constructed, and estimates of its air emissions are not available. Consequently, we were unable to quantify the potential contribution of the proposed biofuels plant to air pollutants in the cumulative effects assessment.

The results of the modeling indicate that the total impact (the sum of modeled concentrations and background concentrations) would be no greater than 42% of the respective NAAQS (Table 6.1). Consequently, significant cumulative air quality impacts from the sum of the proposed facilities and existing sources would not be expected. Maximum concentrations for all pollutants were predicted to occur at the same location on top of Locust Mountain, an undeveloped, forested area slightly over 3 miles north of the proposed site.

As discussed in Section 4.1.2.2, a high percentage of hazardous air pollutants and trace elements in the synthesis gas of the proposed facilities would be removed, but no firm estimates of the proposed facilities' emissions of these pollutants are currently available, with the exception of estimates of 38.6 lb per year of mercury and 2.4 lb per year of arsenic.

WMPI has estimated that the actual sum of hazardous air pollutant emissions would possibly be about 1.5 tons per year. (Details on this estimate are provided in Section 4.1.2.2.) Consequently, the quantity of a single hazardous air pollutant would likely be less than 1 ton per year. As a measure of cumulative impacts associated with combining the proposed facilities with existing sources of mercury, beryllium, and arsenic emissions in the area, including the existing power plants, the projected emissions from the proposed facilities were compared with EPA's 1999 National-Scale Air Toxics Assessment: 1999 Data Tables http://www.epa.gov/ttn/atw/nata1999/tables.html) database that provides (1) modeled concentrations of existing sources within about 30 miles of the site and (2) background

concentrations based on monitored values for mercury (because outdoor concentrations of mercury and 27 other air toxics should include background components attributable to long-range transport, unidentified emission sources, and natural emission sources). No background concentrations are available in the EPA database for beryllium or arsenic. Background concentrations are the contributions to outdoor air toxics concentrations resulting from natural sources, persistence in the environment of past years' emissions, and long-range transport from sources beyond the 30-mile radius. To assess the health implications of exposures to outdoor air toxics, estimated concentrations were compared to reference concentrations published by EPA. Reference concentrations define exposure levels that will not cause significant risks of non-cancer health effects. According to EPA (1991), long-term exposures to levels below reference concentrations are assumed to produce no ill effects.

Table 6.1. Cumulative impact analysis combining potential impacts from the proposed facilities, six existing power plants, and background concentrations[a]

Pollutant	Averaging period[b]	Modeled concentration[c] ($\mu g/m^3$)	Background concentration[d] ($\mu g/m^3$)	Total impact ($\mu g/m^3$)	NAAQS ($\mu g/m^3$)	Total impact as a % of NAAQS
SO_2	1-hour	107	--	--	--	--
	3-hour	96	152	248	1,300	19
	24-hour	43	71	114	365	31
	Annual	9	19	28	80	34
NO_2	1-hour	92	--	--	--	--
	Annual	7	35	42	100	42
PM-10	1-hour	9	--	--	--	--
	24-hour	4	60	64	150	42
CO	1-hour	77	3,220	3,297	40,000	8
	8-hour	54	1,610	1,664	10,000	17

[a]Modeled sources include the proposed coal-to-oil facilities and 6 existing power plants (Gilberton, Schuylkill, Wheelabrator, Northeastern, Mt. Carmel, and Panther Creek).

[b]The ISCST3 model was used to predict maximum 1-hour concentrations of each pollutant. Conversion factors from the 1-hour predictions were used to estimate concentrations for longer averaging periods: 3-hour = 0.9, 8-hour = 0.7, 24-hour = 0.4, and annual = 0.08 (EPA 1992).

[c]Because no quality-assured wind data have been archived from a location near enough to be representative of the proposed site, maximum concentrations were calculated using the ISCST3 model for the same full range of 54 potential meteorological conditions used by the SCREEN3 model.

[d]Background data were obtained from the monitoring stations closest to the site. For SO_2 and CO, Shenandoah background concentrations were used. For NO_2 and PM-10, Reading background concentrations were used. (For further information on the background data, see Section 3.2.2.)

For mercury, the National-Scale Air Toxics Assessment lists the annual-average background concentration in Schuylkill County, Pennsylvania, as 0.0015 $\mu g/m^3$, whereas modeled countywide annual-average ambient concentrations from major stationary sources such as the existing Gilberton Power Plant are listed as 3.2×10^{-5} $\mu g/m^3$ and from multiple other sources (e.g., dry

cleaners, small manufacturers, wildfires) as 4.6 x 10^{-5} μg/m^3, for a total existing countywide annual average of 0.001578 μg/m^3 for mercury. These values in EPA's 1999 National-Scale Air Toxics Assessment are averaged spatially throughout Schuylkill County. The total value (0.001578 μg/m^3) would be approximately 0.5% of the reference concentration of 0.3 μg/m^3 for mercury. Consequently, the small amount added to this total value by the proposed facilities (i.e., the estimate of 38.6 lb per year of mercury emissions prior to dilution in the ambient air) (Section 4.1.2.2) would result in a minimal increase in ambient concentrations of mercury, whereas about 99.5% of the reference concentration is available. This evaluation using EPA's National-Scale Air Toxics Assessment database indicates that the cumulative impact of mercury emissions from the proposed facilities and emissions from existing facilities would pose no threat to human health in the area.

For beryllium, the National-Scale Air Toxics Assessment lists no annual-average background concentration in Schuylkill County, Pennsylvania, or elsewhere throughout the United States; modeled countywide annual-average ambient concentrations from major stationary sources such as the existing Gilberton Power Plant are listed as 4.3 x 10^{-7} μg/m^3, from multiple other sources (e.g., dry cleaners, small manufacturers, wildfires) as 2.9 x 10^{-5} μg/m^3, and from non-road mobile sources as 7.4 x 10^{-8} μg/m^3, for a total existing countywide annual average of 3.0 x 10^{-5} μg/m^3 for beryllium. These values in EPA's 1999 National-Scale Air Toxics Assessment are averaged spatially throughout Schuylkill County. The total value (3.0 x 10^{-5} μg/m^3) would be approximately 0.2% of the reference concentration of 0.02 μg/m^3 for beryllium. Consequently, the small amount added to this total value by the proposed facilities would result in a minimal increase in ambient concentrations of beryllium, whereas about 99.8% of the reference concentration is available. This evaluation using EPA's National-Scale Air Toxics Assessment database indicates that the cumulative impact of beryllium emissions from the proposed facilities and emissions from existing facilities would pose no threat to human health in the area.

For arsenic, the National-Scale Air Toxics Assessment lists no annual-average background concentration in Schuylkill County, Pennsylvania, or elsewhere throughout the United States; modeled countywide annual-average ambient concentrations from major stationary sources such as the existing Gilberton Power Plant are listed as 1.2 x 10^{-5} μg/m^3, and from multiple other sources (e.g., dry cleaners, small manufacturers, wildfires) as 1.0 x 10^{-4} μg/m^3, for a total existing countywide annual average of 1.1 x 10^{-4} μg/m^3 for arsenic. These values in EPA's 1999 National-Scale Air Toxics Assessment are averaged spatially throughout Schuylkill County. The total value (1.1 x 10^{-4} μg/m^3) would be approximately 0.2% of the reference concentration of 0.05 μg/m^3 for arsine (arsenic trihydride) (EPA has not established a reference concentration for inorganic arsenic). Consequently, the small amount added to this total value by the proposed facilities (i.e., the estimate of 2.4 lb per year of arsenic emissions prior to dilution in the ambient air) (Section 4.1.2.2) would result in a minimal increase in ambient concentrations of arsenic, whereas about 99.8% of the reference concentration is available. This evaluation using EPA's National-Scale Air

Toxics Assessment database indicates that the cumulative impact of arsenic emissions from the proposed facilities and from existing facilities would pose no threat to human health in the area.

GREEN Renewable Energy, Ethanol & Nutrition Holding LLC has proposed the construction of a biofuels (corn-to-ethanol) production plant in Frailey and Porter townships in Schuylkill County (about 10-15 miles southwest of Pottsville, or about 20 miles from the site of the proposed facilities). The biofuels facility is expected to produce 100 million gallons of ethanol each year from 40 million bushels of corn; operation is expected by late 2008[1]. Air emissions estimates for the proposed facility are not yet available. Because steam for the biofuels plant would be supplied from an existing co-generation plant located nearby, the proposed plant would cause a smaller increase in area emissions of air pollutants than if steam were produced onsite. However, the facility can be expected to add to local emissions of PM and possibly other criteria pollutants. Also, on April 11, 2007 the Pennsylvania Department of Environmental Protection issued an air permit for the storage of ethanol produced by the facility. The permit allows no more than 8.17 tons/year of volatile organic compounds (VOCs) to be released from the storage tanks. The permitted releases would increase Schuylkill County VOC emissions (7,840 tons per year in 1999; see Section 4.1.2.2) by just 0.1%. As discussed in Section 4.1.2.2, this small increase could slightly increase ozone (O_3) concentrations, but any increase would be insufficient to cause a violation of the ambient air quality standard.

6.1.2 Greenhouse Gas Emissions

As discussed in Section 4.1.2.2, ***the operation of the*** proposed facilities would increase global CO_2 emissions by about ***2,280,000*** tons per year, ***adding to global emissions of CO_2 resulting from fossil fuel combustion, which are estimated to have averaged 29,000,000,000 tons per year during the period 2000 to 2005 (IPCC 2007).***

In addition, the successful demonstration of the integration of coal waste gasification and F-T synthesis of liquid hydrocarbon fuels at a commercial scale may encourage the development of similar facilities producing liquid hydrocarbon fuels from coal. Therefore, another consideration for evaluating potential cumulative impacts from the proposed facilities on greenhouse gas emission totals was to compare the greenhouse-gas contribution from the coal-to-liquids (CTL) technology to be demonstrated with the greenhouse-gas contribution from conventional technologies for producing liquid transportation fuels. Because coal has a higher carbon-to-hydrogen ratio than crude oil, production of liquid hydrocarbon fuel from coal generates more excess carbon (released as CO_2) than production of the same quantity of liquid fuel from petroleum.

Over the entire fuel lifecycle (from production of the raw material in a coal mine or oil well through utilization of the fuel in a vehicle) and considering all greenhouse gases, production and delivery of liquid transportation fuels from coal has been estimated to result in about 80% more

[1] Pottsville Republican & Herald, April 13, 2007. http://www.republicanherald.com/site/news.cfm?newsid=18205685

greenhouse-gas emissions than from production and delivery of conventional petroleum-derived fuels (Marano and Ciferno 2001, Williams and Larson 2003, Williams et al. 2006). DOE is aware that other life-cycle analyses, using differing assumptions have resulted in differing greenhouse gas emission estimates. These fuel life-cycle emission estimates can vary depending on the assumptions made about the transportation of raw materials and liquid fuels, process efficiency, electricity production at the CTL conversion facility, and other factors. Recently the U.S. Environmental Protection Agency (EPA)[2] reported an estimate that greenhouse gas emissions from CTL could be as much as 119% higher than those from conventional petroleum fuels.

Recovery and sequestration of CO_2 at a CTL production facility (Section 5.1.4) could greatly reduce greenhouse gas emissions from CTL fuel production, possibly to levels below conventional petroleum-derived fuel production (Marano and Ciferno 2001). Because CO_2 recovery can be integrated into the gas cleanup step in CTL facilities (such as the proposed facilities considered in this EIS), the potential technical and economic feasibility of CO_2 recovery is much greater for CTL production than for conventional petroleum fuel production (IPCC 2005). Based on a conceptual analysis of potential CO_2 capture and sequestration at facilities that produce liquid fuels from coal using technologies similar to those included in the proposed project, it has been estimated that CO_2 sequestration could reduce total fuel-cycle greenhouse gas emissions to 8% more than from the conventional petroleum-derived fuel cycle (Williams et al. 2006). Likewise, the EPA analysis cited above estimated that carbon capture and sequestration could reduce greenhouse gas emissions to 3.7% above the conventional petroleum-derived fuel cycle. With technology advancements, future large-scale CTL facilities are expected to be able to achieve higher rates of CO_2 capture and sequestration (Larson and Tingjin 2003, Southern States Energy Board 2006), potentially resulting in life-cycle greenhouse-gas emissions that are lower than those resulting from use of conventional petroleum refineries that are not equipped for CO_2 capture and sequestration.

In estimating how increased use of CTL technology could affect total greenhouse gas emissions associated with liquid transportation fuels, DOE considered forecasts of the potential extent of CTL utilization in 2030. Using reference case assumptions, the Energy Information Administration (2007) has forecast that by 2030 U.S. CTL production will consume 55,000,000 tons of coal annually (3.1% of the nation's coal use) and produce the equivalent of 440,000 barrels of crude oil per day, supplying 1.6% of the nation's liquid fuel consumption. Based on this forecast and assuming the CTL fuel cycle generates 80% more greenhouse-gas emissions than production and delivery of conventional petroleum-derived fuels (Marano and Ciferno 2001, Williams and Larson 2003, Williams et al. 2006), the use of CTL technology for producing transportation fuels would cause the life cycle greenhouse gas releases of the U.S. liquid fuel sector to be 1.3% higher in the year 2030 than if the same quantity of liquid fuel was produced from petroleum. If all CTL facilities employed carbon sequestration that reduced greenhouse-gas emissions from the CTL to about 8% more than the petroleum-derived liquid fuel cycle, the greenhouse-gas emission

[2] US Environmental Protection Agency, Greenhouse Gas Impacts of Expanded Renewable and Alternative Fuels Use, EPA420-F-07-035, April 2007. http://www.epa.gov/otaq/renewablefuels/420f07035.htm

contribution of the U.S. liquid fuel sector in that same year would be about 0.1% higher than if the same quantity of liquid fuel was produced from petroleum. If fuel-cycle emissions from CTL technologies were reduced to 10% less than conventional petroleum technologies due to a combination of more efficient carbon capture and sequestration at CTL production facilities, increased capture of the methane released during coal mining, and other potential mitigation measures (Marano and Ciferno 2001), the greenhouse-gas emission contribution of the U.S. liquid fuel sector would be about 0.2% less than if the same quantity of liquid fuel was produced from petroleum.

Using high-range estimates of future oil prices (high oil prices would encourage more CTL production), the Energy Information Administration (2007) has forecast that in the year 2030 U.S. CTL production would consume 199,000,000 tons of coal (9.8% of the nation's coal use) and produce the equivalent of 1,650,000 barrels of crude oil per day, supplying 6.7% of the nation's liquid fuel consumption. Based on this forecast and assuming the CTL fuel cycle generates 80% more greenhouse-gas emissions than production and delivery of conventional petroleum-derived fuels, expanded use of CTL technology to produce liquid fuels could cause the U.S. liquid fuel sector to release about 5% more greenhouse gas emissions than if the same quantity of fuel was produced from petroleum. However, carbon sequestration that reduces greenhouse-gas emissions from the CTL fuel cycle to about 8% more than the petroleum-derived liquid fuel cycle could reduce this greenhouse-gas emission increment to about 0.5% more than if the same quantity of liquid fuel was produced from petroleum. If fuel-cycle emissions from CTL technologies were reduced to 10% less than conventional petroleum technologies due to more efficient CO_2 capture and sequestration and other measures, as discussed above, the greenhouse-gas emission contribution of the U.S. liquid fuel sector would be about 0.7% less than if the same quantity of liquid fuel was produced from petroleum.

6.2 Water Resources

Water consumption by the proposed facilities would contribute to a trend of increasing diversion and consumptive use of water from the Susquehanna River Basin.[3] The Susquehanna River Basin Commission (2003) found that diversions and consumptive uses of water from the 27,510-square-mile Susquehanna River watershed increased 85% between 1970 and 2000 (from a daily maximum of 270 million gal per day in 1970 to a maximum of about 500 million gal per day in 2000) and could increase an additional 55% by 2020. In this region, consumptive uses and diversions that affect surface waters could adversely affect the maintenance of minimum stream flows needed to sustain aquatic habitats or dilute treated wastewater effluents. Langland et al. (2001) did not find any long-term trend in Susquehanna River stream flow during the period from 1985 to 1999, but reported large variability in flow. Increased industrial use of mine pool water has been a small contributor to the basin-wide trend toward increased consumptive use. Veil et al. (2003) identified 5 power plants,

[3] Diversion refers to the transfer of water to a different watershed. Water is considered to be used consumptively when evaporated, transpired by plants, or incorporated into manufactured products.

including the Gilberton Power Plant, in the anthracite coal mining region that began operation after 1980 and use mine pool water from the Susquehanna River Basin for cooling and other purposes. These plants withdraw a total of about 3,600 gpm (more than 5 million gal per day); the majority of this water is discharged after use, but a fraction is used consumptively. The proposed facilities' net consumption of 2,290 gpm (about 3.3 million gal per day) from the Susquehanna River watershed would contribute to the general trend of increased water consumption, adding about 1% to the region's total water consumption as of 1970 or about 0.7% to consumption as of 2000. The 1985–99 stream flow record suggests that the watershed could accommodate this added consumption.

Several initiatives to enhance water quality are ongoing, planned, or proposed for the Mahanoy Creek watershed and the adjacent Shamokin Creek watershed, which is interconnected by underground mine workings with downstream portions of the Mahanoy Creek watershed. Initiatives being undertaken by government, voluntary groups, and private entities include (1) construction and maintenance of artificial wetlands and other passive treatment systems at sites where acid mine drainage emerges from abandoned mines; (2) filling of abandoned surface mine pits; and (3) removal of abandoned coal refuse piles with subsequent grading and planting of vegetation at the site to reduce the amounts of sediments, acid mine drainage, and coal waste runoff entering streams (PDEP 2004d). The proposed project would contribute to efforts to improve water quality in the Mahanoy and Shamokin Creek watersheds by reducing the discharge of Gilberton mine pool water to Mahanoy Creek, removing anthracite culm piles, filling mine pits, and reclaiming mined lands. ***However, effluents from the proposed facilities could deplete dissolved oxygen in Mahanoy Creek and introduce other contaminants deleterious to aquatic life, as discussed in Section 4.1.4.1, potentially causing the creek to remain unsuitable for aquatic life.***

The planned and proposed developments described in Section 6.3 are not likely to be important sources of cumulative impacts to water quantity or quality. Construction-related site clearing, erosion, and stormwater runoff would be the main potential sources of water-resources impacts from these projects. The proposed ethanol plant discussed in Section 6.1.1 could contribute to projected future increases in use of water from the Susquehanna River Basin. However, any water effluents from the plant would enter other tributaries of the river, so the proposed ethanol plant would not affect water quality in Mahanoy Creek.

6.3 Social and Economic Resources

Construction and operation of the proposed facilities would have socioeconomic impacts that could contribute to cumulative impacts on the area's socioeconomic resources. The Pennsylvania Department of Environmental Protection recently identified 2 areas of proposed future growth, the Interstate 81 corridor and the State Route 61 corridor, located within a few miles of the proposed project site in Schuylkill County (PDEP 2002). Along the Interstate 81 corridor, the Schuylkill Economic Development Corporation is attracting industrial development to the Schuylkill Highridge Business Park and Mahanoy Business Park. The Schuylkill Highridge Business Park is the largest mixed-use business park in Pennsylvania, with a 2,000-acre corridor along Interstate 81 between exits

116 and 119. The Park's first major tenant, Lowe's Companies, Inc., has constructed a 1.2 million square ft regional distribution center on a 165-acre parcel. Similar developments are either underway or will begin construction in the Highridge Business Park within the next few years (SEDCO 2004):

- Wegman's Food Markets, Inc., distribution complex (1 million square ft of building space to be constructed by 2008);
- Robert Patillo Properties, Inc., (455,000 square ft of building space already constructed; another 1.8 million square ft to be constructed in the near future for a Sears, Inc., distribution center); and
- Wal-Mart, Inc., frozen foods distribution center (900,000 square ft of building space to be constructed).

The 500-acre Mahanoy Business Park is located near exit 131 of Interstate 81 on Morea Road near Mahanoy City, about 3 miles east of the proposed project site. Although no buildings have been constructed in the Mahanoy Business Park, the site is serviced by water, wastewater, and gas lines and is likely to be developed in the future. The Mahanoy Business Park could accommodate 2 million square ft of building space (SEDCO 2004). Except for these ongoing and planned industrial developments within the Schuylkill Highridge Business Park and Mahanoy Business Park, no plans exist for large-scale industrial, commercial, or residential developments within the next few years in Schuylkill County (Frank Zukas, Schuylkill Economic Development Corporation, personal communication to J. W. Saulsbury, ORNL, September 22, 2004). ***The Locust Ridge Wind Farm recently constructed near Mahanoy City consists of thirteen 400-ft-tall wind turbines that will generate up to 26 MW of electricity.[4] Construction of additional wind turbines is currently proposed.[5] There is a potential for cumulative socioeconomic and transportation-system impact from future wind farm construction, but after construction is complete wind farm operation requires few employees or other resources. Because operating wind turbines do not produce air emissions or water effluents, the operation of the existing wind farm would not contribute to cumulative impacts on air or water quality in the region.***

The Pennsylvania Department of Transportation has identified 9 future road projects in Schuylkill County (PDOT 2004), but 6 of them are far enough removed from the proposed project site that cumulative impacts are not likely. However, 3 of the 9 road projects could contribute to cumulative impacts because they are in close proximity to the proposed project site or are large enough to have countywide impacts: (1) Mahanoy City Pipe Replacement (under State Route 54 near the Mahanoy City line); (2) Interstate 81 Bridge Replacement Phase 2 (near Pine Grove Township); and (3) State Route 924 Rock Scaling (on a 1-mile section north of Frackville) (PDOT 2004).

---

[4]***Global Wind Energy Leader Iberdrola Announces Power Purchase Agreement For First U.S. Wind Project. September 27, 2006. http://www.communityenergy.biz/pr/cei_pr_iberdrola-ppa.html***
[5]***Pottsville Republican & Herald, March 15, 2007. http://www.republicanherald.com/site/news.cfm?newsid=18081496***

Construction of the proposed project could combine with ongoing and planned activities, particularly industrial development in the Schuylkill Highridge Business Park and Mahanoy Business Park to create cumulative impacts to socioeconomic resources. The largest contribution to cumulative impacts from the proposed facilities would be the presence of 1,000 workers during the 6-month peak construction period. Such a large work force could combine with other activities to adversely affect water and wastewater services and the flow and safety of vehicular traffic. The proposed facilities' contributions to cumulative socioeconomic impacts would continue during project operations, but at a smaller scale because fewer workers would be present.