CHAPTER 5
CUMULATIVE IMPACTS

The CEQ regulations for implementing NEPA define a cumulative impact as "the impact on the environment which results from the incremental consequences of an action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency or person undertakes such other actions" (40 C.F.R. § 1508.7). Cumulative effects include both the direct effects and indirect effects (those effects that occur later in time or farther removed in distance) of a proposed project on a given resource, ecosystem, or community. To assist federal agencies in assessing cumulative impacts under NEPA, CEQ developed a handbook entitled *Considering Cumulative Effects under the National Environmental Policy Act* (CEQ, 1997). OEA followed CEQ's guidelines in its evaluation of whether planned and reasonably foreseeable projects in the area combined with potential construction and operation impacts of the Proposed Action and its alternatives would cumulatively result in significant adverse environmental impacts.

As part of the DEIS, OEA consulted with RJCP, local municipalities, regional planning departments, and state/federal agencies; and conducted public outreach and scoping activities to identify other past, present, and reasonably foreseeable future actions in the general project area. These efforts resulted in the identification of several local and regional projects that are relatively concurrent geographically and temporally with the Proposed Action. Therefore, OEA included these projects in Chapter 5 of the DEIS as part of the cumulative impact assessment for the proposed project. These identified projects included:

- RRLLC's proposed landfill/industrial development project,
- Glenn O. Hawbaker proposed sand/gravel quarry,
- Rex Energy Corporation proposed Marcellus Shale natural gas drilling/ wastewater treatment projects,
- Robindale Energy Services, Inc. proposed surface/deep mining projects,
- A.W. Long Coal surface mining/natural gas water treatment projects,
- Various Cooper Township Marcellus Shale natural gas drilling projects,
- PennDOT I-80 Improvements – Centre and Clearfield Counties, and
- PennDOT S.R. 2035, Section A01 – Main Street Bridge Replacement over Sulphur Run, Village of Winburne, Cooper Township, Clearfield County.

The purpose of this chapter is to discuss several changes to these projects that have occurred since issuance of the DEIS. Appendix A contains documentation from RJCP, RRLLC, and others about these changes. Besides the change from a landfill to a waste-to-ethanol facility, many of the changes have resulted from new entities that have become responsible for particular actions or projects. For example, in its October 5, 2010 correspondence, RRLLC explained that the quarry originally proposed to be operated by Glenn O. Hawbaker, Inc. is now proposed to be operated by HRI, Inc.

OEA has concluded that the cumulative impacts analysis presented in Chapter 5 of the DEIS would not substantively change based on the new information presented here. Changes to the identified projects are described below.

RRLLC's proposed landfill/industrial development project:

As originally presented in the DEIS, RRLLC's proposed landfill, if permitted by the Pennsylvania Department of Environmental Protection (PA DEP), would have provided a waste disposal capacity of approximately 40 million tons and allow for a 28-year landfill life, based on an average daily volume of waste equal to 5,000 tons. The proposed permit area would have occupied approximately 710 acres and include a soil borrow area, access roads, stormwater management facilities, and ancillary structures. The lined landfill footprint area would have occupied approximately 274 acres.

Since the preparation of the DEIS, RRLLC has entered into agreement with a major bio-ethanol company to build and operate a production plant that would use municipal solid waste to manufacture fuel-grade ethanol. According to RRLLC, this waste-to-ethanol facility has decreased the need for a larger-sized landfill. Once the waste has been processed through the ethanol facility, the volume of material would be reduced by 80 percent. Therefore, only 20 percent of the waste material received at the site would ultimately enter the landfill, which would allow for a smaller landfill operation than was originally planned.

The production process that RRLLC would use at its waste-to-ethanol facility is a combined thermo-chemical and bio-chemical process involving three main steps. These three main steps include:

- **Gasification** - The prepared organic carbon material is gasified using a controlled amount of oxygen to produce synthesis gas, a mixture of principally carbon monoxide and hydrogen. The gasifier design and operating conditions have been carefully chosen to inhibit the formation of dioxins and furans and to suppress the carry-over of volatile metals. The hot synthesis gas is quenched and cleaned. Heat is recovered to generate renewable power for use in the process.

- **Fermentation** - The cleaned, cooled synthesis gas is passed into a patented fermentation process, where it is converted selectively into ethanol by naturally occurring anaerobic bacteria (the biocatalyst). The fermentation environment, containing the right quantity and type of nutrients, is maintained at carefully controlled conditions. The bacteria, in this healthy state, achieve an extremely high selectivity to ethanol and high yield of ethanol. The high selectivity and yield translate to outstanding process efficiencies.

- **Purification** - The ethanol solution is purified and refined to make anhydrous ethanol (>99.7% ethanol). This can be blended into gasoline as required for the local, renewable road transport fuel market.

Based on this substantial change, OEA has re-evaluated the potential cumulative impacts associated with this project. Given the noted reduction in landfill footprint area, OEA has determined that this cumulative impact project would result in a smaller acreage impact to land use (i.e., abandoned/

reverting strip mine areas and undeveloped forestland) and biological resources (i.e., vegetative communities/wildlife habitat) from the impact presented in the DEIS. This finding is based on RRLLC's statement regarding an 80 percent reduction in disposable material and the decreased need for a larger-sized landfill. However, part of the decreased acreage impact associated with the reduced landfill footprint would be offset by the acreage needed to construct the proposed waste-to-ethanol facility. Given the preliminary nature of these actions, OEA was unable to quantify an exact difference in acreage from the original landfill proposal to the currently proposed landfill/waste-to-ethanol facility.

This cumulative impact project would potentially be beneficial to energy resources. As noted above, the fuel-grade ethanol that would be generated by this facility is a sustainable, cost-competitive, carbon neutral bio fuel. Production of this renewable energy resource would have the dual benefit of minimizing dependence on foreign oil by using an advanced form of technology to convert everyday waste into a highly valuable commodity. If successful, this form of green energy development has substantial market potential. Thus, OEA concluded that RRLLC's proposed waste-to-ethanol facility would likely result in a positive cumulative impact to energy resources.

From an air quality perspective, OEA concluded that the thermo-chemical gasification step associated with the waste-to-ethanol process would likely result in the emission of some carbon monoxide and hydrogen. Based on the available data, OEA was unable to determine if any other airborne emissions would be generated as a result of this chemical process. Any airborne emissions generated by RRLLC's proposed waste-to-ethanol facility would be regulated in accordance with the facility's PA DEP permit and must be in compliance with National Ambient Air Quality Standards.

Regarding cumulative water resource impacts, OEA concluded that RRLLC's proposed waste-to-ethanol facility would need to be permitted by PA DEP, and in so doing, PA DEP would require all applicable emergency response and spill management measures to be incorporated into the design and construction of the facility. Therefore, the RRLLC waste-to-ethanol facility would not likely result in cumulative water resource impacts.

As with any thermo-chemical process, certain safety concerns (i.e., potential fire and/or explosion) are possible. However, given the proprietary nature of this new technology, OEA was unable to render a conclusion as to the likelihood of occurrence. In fact, data do not exist for such new forms of technology. Therefore, OEA relied on the remoteness of the site as its primary basis of analysis. Given the remote, undeveloped nature of the proposed site, OEA concluded that a potential safety incident (i.e., fire and/or explosion) occurring at RRLLC's proposed waste-to-ethanol facility would be negligible with regard to cumulative safety impacts. Similarly, any emergency response services required at the site (i.e., police, fire, ambulance, hazardous materials response, etc.) would likely be within the existing service capabilities of existing local and regional service providers.

Glenn O. Hawbaker proposed sand/gravel quarry:

As noted above, RRLLC submitted written correspondence indicating that the proposed quarry, which was discussed as a cumulative impact project in Chapter 5 of the DEIS, continues to move forward, but under the auspices of a new operator. HRI, Inc. has replaced Glenn O. Hawbaker, Inc. as the proposed quarry operator. In addition, RRLLC stated that the proposed quarry has undergone an adjustment of location arising from the development of a higher yield for aggregate on the

property. RRLLC also submitted documentation (see Appendix A) of the Conditional Use Approval granted by Snow Shoe Township for the proposed 44-acre quarry.

Rex Energy Corporation proposed Marcellus Shale natural gas drilling/wastewater treatment projects:

As originally presented in the DEIS, Rex Energy Corporation was seeking to permit a facility in the immediate area of the proposed rail line for processing "frac water" from natural gas extraction in the nearby Marcellus Shale fields of central and southwestern Pennsylvania. The DEIS also stated that Rex Energy had secured mineral rights to the larger RRLLC property to drill for natural gas. In its October 5, 2010 correspondence, RRLLC clarified that the permitting and construction of the water treatment facility will now be handled and managed by Keystone Clearwater Solutions instead of Rex Energy, Inc. Similarly, the natural gas drilling operations will now be conducted by Williams Production Appalachia LLC (Williams) instead of Rex Energy, Inc. Subsequent correspondence to the Board from Williams (see Appendix A) indicates that it is currently conducting exploration activities on the RRLLC leasehold and is interested in being a potential shipper on RJCP's proposed rail line.