DOE/EA-1710

FINAL
ENVIRONMENTAL ASSESSMENT

DOE'S PROPOSED FINANCIAL ASSISTANCE TO ENERDEL, INC. FOR ITS EXPANSION OF BATTERY MANUFACTURING CAPABILITIES AT INDIANAPOLIS, NOBLESVILLE AND GREENFIELD, INDIANA

U.S. Department of Energy
National Energy Technology Laboratory

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COVER SHEET

RESPONSIBLE AGENCY: U.S. Department of Energy (DOE)

TITLE: *Final Environmental Assessment: DOE's Proposed Financial Assistance to EnerDel, Inc. for Its Expansion of Battery Manufacturing Capabilities at Indianapolis, Noblesville and Greenfield, Indiana* (DOE/EA-1710)

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This EA is also available on DOE's National Energy Technology Laboratory web site at the following address: http://www.netl.doe.gov/publications/others/nepa/ea.html.

Abstract: DOE prepared this EA to evaluate the potential environmental impacts of providing three types of financial assistance to EnerDel, Inc. (EnerDel) to expand its domestic manufacturing of lithium-ion batteries: (1) a grant under Funding Opportunity Announcement DE-FOA 0000026, *Recovery Act – Electric Drive Vehicle Battery and Component Manufacturing Initiative*; (2) a loan under Funding Opportunity Announcement DE-FOA 0000052, *State Energy Program Formula Grants – American Recovery and Reinvestment Act (ARRA)*; and (3) a loan pursuant to Section 136 of the *Energy Independence and Security Act of 2007* (Energy Act) as an automotive component supplier promoting improved fuel economy in light-duty vehicles. As the names of the Funding Opportunity Announcements indicate, these two methods of assistance would derive from funds appropriated by the *American Recovery and Reinvestment Act of 2009* (Recovery Act; Public Law 111-5, 123 Stat. 115). Alternatively, the loan under the State Energy Program funding opportunity would be provided by the State of Indiana from the formula grant it received from DOE under that funding opportunity. This EA analyzes the potential environmental impacts of EnerDel's proposed project to expand its manufacture of lithium-ion batteries, the three proposed federal actions (two loans and one grant), and the alternatives to each of these proposed actions.

EnerDel, an Indiana-based company, currently provides system integration from cell to battery in a mass production-scale operation. It operates two facilities in central Indiana: one in the northeast section of Indianapolis and one in the southern part of Noblesville, which is about 20 miles northeast of the center of Indianapolis. Under its proposed project, EnerDel would add cell manufacturing and pack assembly capacity by obtaining and outfitting a new third facility

located near Greenfield, Indiana. This EA evaluates 14 resource areas and identifies no significant adverse impacts from EnerDel's proposed project. Beneficial impacts to the nation's air quality and transportation could be realized from implementation of the proposed project, as it could lead to increased use of electric vehicles. In addition, minor beneficial socioeconomic impacts would occur from increased employment opportunities and spending in the local economy.

Availability: DOE encourages public participation in the NEPA process. A Notice of Availability was placed in *The Indianapolis Star* on January 9, 12, and 13, 2010. The Draft EA was made available for public review on DOE's National Energy Technology Laboratory web site and at the following public libraries:

Marion County Public Library
Lawrence Branch
7898 N. Hague Road
Indianapolis, IN 46256

Hamilton County East Public Library
1 Library Plaza
Noblesville, IN 46060-5640

Hancock County Public Library
900 West McKenzie Road
Greenfield, IN 46140

The public was encouraged to submit comments to the DOE address listed above by the close of the comment period, February 8, 2010. Reviewers were also given the option of submitting comments by fax or email. Comments received are summarized in the EA and, as appropriate, DOE responses are provided.

ACRONYMS AND ABBREVIATIONS

CFR	Code of Federal Regulations
DOE	U.S. Department of Energy (also called the Department)
EA	environmental assessment
EnerDel, Inc.	EnerDel
Energy Act	*Energy Independence and Security Act of 2007*
EPA	U.S. Environmental Protection Agency
IPL	Indianapolis Power and Light
MSA	Metropolitan Statistical Area
NAAQS	National Ambient Air Quality Standards
NEPA	*National Environmental Policy Act of 1969*, as amended
NMP	n-methylpyrrolidone
PM_{10}	particulate matter with an aerodynamic diameter of 10 micrometers or less
$PM_{2.5}$	particulate matter with an aerodynamic diameter of 2.5 micrometers or less
RCRA	*Resource Conservation and Recovery Act*
Recovery Act	*American Recovery and Reinvestment Act of 2009*, as amended
SEP	State Energy Program
Stat.	United States Statutes at Large
U.S.C.	United States Code

Note: Numbers in this EA generally have been rounded to two or three significant figures. Therefore, some total values might not equal the actual sums of the values.

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SUMMARY

The U.S. Department of Energy proposes to provide as many as three types of financial assistance to EnerDel Inc., an Indiana-based company, for the expansion of its domestic advanced battery manufacturing activities for the transportation industry. The proposed financial assistance would help EnerDel expand its manufacturing and testing capabilities at two existing facilities and start up a third facility for future development into a complete lithium-ion battery manufacturing plant. The existing EnerDel facilities consist of a 92,000-square-foot building in Indianapolis and a 32,000-square-foot building in Noblesville, just north of Indianapolis. The lithium-ion battery manufacturing capacity of the Indianapolis facility would increase through the addition of equipment, and the Noblesville location would transition into full use as a prototype development and battery testing facility through the addition and change-out of equipment. The exteriors of the Indianapolis and Noblesville facilities would be unchanged. The third facility is a newly acquired vacant warehouse near Greenfield, Indiana, just east of Indianapolis. This 423,000-square-foot building would require minor construction and equipment installation on the exterior of the building; however, essentially all of the work necessary to transform it into a manufacturing plant would consist of installation of equipment inside the building.

For purposes of the *National Environmental Policy Act of 1969*, as amended (42 U.S.C. Section 4321 et seq.), DOE's proposed actions are to provide EnerDel with one or more of the following types of financial assistance: (1) a grant under Funding Opportunity Announcement DE-FOA 0000026, *Recovery Act – Electric Drive Vehicle Battery and Component Manufacturing Initiative;* (2) a loan under Funding Opportunity Announcement DE-FOA 0000052, *State Energy Program Formula Grants – American Recovery and Reinvestment Act (ARRA);* and (3) a loan pursuant to Section 136 of the *Energy Independence and Security Act of 2007* (Public Law 110-140, 121 Stat. 1492) as an automotive component supplier promoting improved fuel economy in light-duty vehicles. As the names of the Funding Opportunity Announcements indicate, the grant and loan under these programs would be made from funds appropriated by the *American Recovery and Reinvestment Act of 2009* (Public Law 111-5, 123 Stat. 115); the loan under the State Energy Program funding opportunity would be provided by the State of Indiana from the formula grant it received from DOE under that funding opportunity. DOE will make separate decisions as to each type of financial assistance that EnerDel has sought from the Department after DOE has evaluated the potential environmental impacts and other aspects of EnerDel's proposed project.

Because the Indianapolis and Noblesville expansions would occur within existing buildings, the potential for environmental impacts to the surrounding area would be limited to incremental increases in energy use, utility service needs (for example, water, sewer, and municipal solid waste), generation of hazardous and industrial waste, and vehicle traffic. The Indianapolis facility would have an incremental increase in air emissions already allowed under the existing air quality permit.

EnerDel's proposed activities at the Greenfield facility would represent the first use of a recently constructed commercial building. All of the associated air emissions, energy use, utility service needs, generation of hazardous and industrial waste, and vehicle traffic would represent new impacts to that area. Energy and utility needs and waste production would be within the capacity of existing services and suppliers. Air emissions, particularly of volatile organic compounds, would be high enough that a more rigorous air quality permitting effort would be required than was needed for the Indianapolis facility, but the quantities emitted would still be minor in comparison with the totals already emitted in the region. Added traffic would also be an impact of the Greenfield facility; this area is already identified as one with traffic congestion.

The Indianapolis, Noblesville, and Greenfield communities would experience modest positive socioeconomic impacts due to the projected increase in direct and indirect employment. It is estimated that the proposed project might increase EnerDel employment from a current level of about 160 workers up to as many as about 1,600 workers, with most of these (about 1,140) at the proposed Greenfield facility.

1. INTRODUCTION

EnerDel Inc. (EnerDel), an Indiana-based company, has proposed to expand its domestic manufacturing of lithium-ion batteries. In order to facilitate this expansion, the U.S. Department of Energy (DOE or the Department) is considering providing EnerDel with one or more of the following types of financial assistance: (1) a grant under Funding Opportunity Announcement DE-FOA 0000026, *Recovery Act – Electric Drive Vehicle Battery and Component Manufacturing Initiative;* (2) a loan under Funding Opportunity Announcement DE-FOA 0000052, *State Energy Program Formula Grants – American Recovery and Reinvestment Act (ARRA);* and (3) a loan pursuant to Section 136 of the *Energy Independence and Security Act of 2007* (Energy Act; Public Law 110-140, 121 Stat. 1492) as an automotive component supplier promoting improved fuel economy in light-duty vehicles. As the names of the Funding Opportunity Announcements indicate, the grant and loan would come from funds appropriated by the *American Recovery and Reinvestment Act of 2009* (Recovery Act; Public Law 111-5, 123 Stat. 115); the loan under the State Energy Program (SEP) opportunity would be provided by the State of Indiana from the formula grant it received from DOE under that funding opportunity. DOE will make separate decisions as to each type of financial assistance after evaluating the potential environmental impacts and other aspects of EnerDel's proposed project.

As part of the Recovery Act, DOE's National Energy Technology Laboratory, on behalf of the Office of Energy Efficiency and Renewable Energy's Vehicle Technologies Program, will provide up to $2 billion in federal funding to competitively selected recipients for the construction (including production capacity increase of current plants) of U.S. manufacturing plants that produce batteries and electric drive components. DOE's Golden Field Office, also on behalf of the Office of Energy Efficiency and Renewable Energy, provided the State of Indiana a $68.6 million formula grant for its SEP pursuant to another appropriation under the Recovery Act. Indiana informed DOE that it intends to provide EnerDel with a loan of $5 million from the State's SEP formula grant to help finance EnerDel's expansion. In addition to these two potential forms of assistance, DOE's Advanced Technology Vehicle Manufacturing Incentive Program provides loans to eligible automotive manufacturers and component suppliers for projects that promote improved fuel economy in light-duty vehicles pursuant to Section 136 of the Energy Act. DOE's Office of Loan Guarantee is considering EnerDel for a loan under this program for the same expansion of its lithium-ion battery manufacturing capability. The amount of the potential loan has not been determined and is a function of the federal government's assessment of many factors, including EnerDel's ability to repay the loan. The loan would be used for capital and engineering integration expenses associated with the proposed project.

This EA informs the three DOE programs that might assist EnerDel's financing of its expansion of the potential impacts to the environment of that expansion. Assisting in the financing of EnerDel's expansion would constitute a major federal action for which DOE must prepare an environmental assessment (EA) in accordance with NEPA, the Council on Environmental Quality NEPA regulations (40 CFR Parts 1500 to 1508), and DOE's NEPA implementing regulations (10 CFR Part 1021). Therefore, DOE has prepared this *Draft Environmental*

Assessment: DOE's Proposed Financial Assistance to EnerDel, Inc., for Its Expansion of Battery Manufacturing Capabilities at Indianapolis, Noblesville, and Greenfield, Indiana to evaluate the potential environmental consequences of providing one or more types of financial assistance to EnerDel to facilitate its expansion. In compliance with these laws and regulations, this EA examines the potential environmental consequences of DOE's proposed actions (that is, providing up to three types of financial assistance), EnerDel's proposed project, and the No-Action Alternative (under which it is assumed that, as a consequence of DOE's denial of some or all assistance, EnerDel would not proceed with its proposed project). The EA's purpose is to inform DOE and the public of the potential environmental consequences of the proposed project and alternatives.

This chapter explains the background, purpose and need, and the scope of DOE's proposed actions. This chapter also describes results from the public comment period by presenting summaries of comments received and, as appropriate, DOE responses. Chapter 2 describes the alternatives, including DOE's proposed actions, EnerDel's proposed project, and the No-Action Alternative. Chapter 3 details the affected environment and potential environmental consequences of the proposed project and of the No-Action Alternative. Chapter 4 addresses cumulative impacts. Chapter 5 provides the conclusions of the analysis and Chapter 6 lists the references for this EA. Finally, Appendix A contains the distribution list for this document.

1.1 National Environmental Policy Act and Related Procedures

In accordance with its NEPA regulations, DOE must evaluate the potential environmental impacts of its proposed actions that may have a significant impact on human health and the environment, including decisions on whether to provide different types of financial assistance to states and private entities. In compliance with these regulations and DOE's procedures, this EA:

- Examines the potential environmental impacts of the proposed actions and the No-Action Alternative;
- Identifies unavoidable adverse environmental impacts of the proposed actions;
- Describes the relationship between local short-term uses of the environment and the maintenance and enhancement of long-term productivity; and
- Characterizes any irreversible and irretrievable commitments of resources that would be involved should DOE decide to implement its proposed actions.

These requirements must be met before DOE decides whether to proceed with any proposed action that could cause adverse impacts to human health or the environment. This EA fulfills DOE's obligations under NEPA and provides DOE with the information needed to make an informed decision about helping finance EnerDel's proposed expansion of its vehicle battery manufacturing capability. This EA evaluates the potential individual and cumulative effects of the EnerDel proposed project. No other action alternatives are analyzed. For purposes of

comparison, this EA also evaluates the impacts that would occur if DOE did not provide funding to support the EnerDel expansion of vehicle battery manufacturing capability (the No-Action Alternative), under which DOE assumes that EnerDel would not proceed with the expansion. This assumption may be incorrect—that is, EnerDel might proceed without federal assistance. However, this assumption allows DOE to compare the impacts of an alternative in which expansion occurs with one in which it does not.

1.2 Background

DOE's National Energy Technology Laboratory manages the research and development portfolio of the Vehicle Technologies Program for the Office of Energy Efficiency and Renewable Energy. A key objective of the Vehicle Technologies Program is accelerating the development and production of electric-drive vehicle systems in order to reduce the United States' consumption of petroleum. Other goals of the Program are the development of production-ready batteries, power electronics, and electric machines that can be produced in volume economically so as to increase the use of electric drive vehicles.

Congress appropriated significant funding for the Vehicle Technologies Program in the Recovery Act in order to stimulate the economy and reduce unemployment in addition to furthering the existing objectives of the Vehicle Technologies Program. DOE solicited applications for this funding by issuing a competitive funding opportunity announcement (DE-FOA-0000026) entitled, *Recovery Act – Electric Drive Vehicle Battery and Component Manufacturing Initiative*, on March 19, 2009. The announcement invited applications in seven areas of interest:

- Area of Interest 1 – Projects that would build or increase production capacity and validate production capability of advanced automotive battery manufacturing plants in the United States.

- Area of Interest 2 – Projects that would build or increase production capacity and validate production capability of anode and cathode active materials, components (for example, separator, packaging material, electrolytes and salts), and processing equipment in domestic manufacturing plants.

- Area of Interest 3 – Projects that combine aspects of Area of Interest 1 and 2.

- Area of Interest 4 – Projects that would build or increase production capacity and validate capability of domestic recycling or refurbishment plants for lithium-ion batteries.

- Area of Interest 5 – Projects that would build or increase production capacity and validate production capability of advanced automotive electric drive component in domestic manufacturing plants.

- Area of Interest 6 – Projects that would build or increase production capacity and validate production capability of electric drive subcomponent suppliers in domestic manufacturing plants.

- Area of Interest 7 – Projects that combine aspects of Area of Interest 5 and 6.

The application period closed on May 19, 2009, and DOE received 119 proposals across the seven areas of interest. DOE selected 30 projects based on the evaluation criteria set forth in the funding opportunity announcement; special consideration was given to projects that promoted the objectives of the Recovery Act—job preservation or creation and economic recovery—in an expeditious manner.

EnerDel's proposed expansion of its U.S. Advanced Automotive Lithium-Ion Battery Production in Indianapolis, Noblesville, and Greenfield, Indiana, was one of the 30 projects DOE selected for funding. DOE's Proposed Action under this funding opportunity is to provide $118.5 million in financial assistance in a cost-sharing arrangement with the project proponent, EnerDel. The total cost of the proposed EnerDel project is estimated at approximately $600 million.

The Recovery Act also appropriated funds to states, tribes, cities, and other entities using formulas based on population and other factors. One of these "formula grant" programs, *State Energy Program Formula Grants – American Recovery and Reinvestment Act (ARRA)* (Funding Opportunity Announcement DE-FOA-0000052), provided the State of Indiana with $68.6 million. Eligible entities can use these SEP funds for a wide variety of activities related to energy efficiency and renewable energy; however, DOE must conduct a NEPA review of the activities before the recipients can begin execution of the activities. Indiana informed DOE that the State intends to use $5 million of the SEP funds appropriated under the Recovery Act for a loan to EnerDel to purchase equipment for the expansion of its battery manufacturing capabilities in Indiana. DOE's Proposed Action under SEP is to permit Indiana to use its SEP funds for this loan.

DOE's Advanced Technology Vehicle Manufacturing Incentive Program provides loans to eligible automotive manufacturers and component suppliers for qualifying projects that promote improved fuel economy in light-duty vehicles. DOE's Office of Loan Guarantee is considering EnerDel for a loan under this program for the same expansion of its lithium-ion battery manufacturing capability. DOE's Proposed Action under this program is to provide EnerDel with such loan. The amount of this potential loan has not yet been determined and is a function of the federal government's assessment of many factors, including EnerDel's ability to repay the loan. The loan would be used for capital and engineering integration expenses associated with the proposed project.

1.3 Purpose and Need

The overall purpose and need for DOE's Proposed Action under the Vehicle Technologies Program is to accelerate the development and production of various electric-drive vehicle

systems by building or increasing domestic manufacturing capacity for advanced automotive batteries, their components, recycling facilities, and electric-drive vehicle components, in addition to stimulating the U.S. economy. This work will enable market introduction of various electric vehicle technologies by lowering the cost of battery packs, batteries, and electric propulsion systems for electric-drive vehicles through high-volume manufacturing. DOE intends to further this purpose and satisfy this need by providing financial assistance under cost-sharing arrangements to this and the other 29 projects selected under this funding opportunity announcement.

This and the other selected projects are needed to reduce petroleum consumption in the United States by investing in alternative vehicle technologies. Successful commercialization of electric-drive vehicles would support the DOE's Energy Strategic Goal of "protect[ing] our national and economic security by promoting a diverse supply and delivery of reliable, affordable, and environmentally sound energy." This project will also meaningfully assist in the nation's economic recovery by creating manufacturing jobs in the United States in accordance with the objectives of the Recovery Act.

The purpose and need for DOE's Proposed Action under the Advanced Technology Vehicle Manufacturing Incentive Program is to provide loans to projects that will help achieve the goals of Section 136 of the Energy Act. These goals are to re-equip, expand, and establish manufacturing facilities in the United States that produce light-duty vehicles and components that meaningfully improve fuel economy.

The purpose and need for DOE's Proposed Action related to Indiana's use of its SEP formula grant is to ensure the State uses these funds for activities that improve energy efficiency, reduce the overall need for energy or rate of energy consumption, or promote renewable energy.

1.4 Considerations Not Carried Forward For Analysis

The following resource areas or issues are commonly discussed in EAs for actions proposed by DOE. However, in an effort to streamline the NEPA process and enable timely expenditure of Recovery Act funds and provision of loans for fuel-efficiency projects, DOE did not analyze in detail resource areas that it did not anticipate would be impacted by the proposed expansion of EnerDel's battery manufacturing capabilities. For the reasons discussed below, EnerDel's proposed project is not expected to have any measurable effects on certain resources, and descriptions and analyses of these resources are not carried forward into Chapter 3, except where noted.

- Aesthetics and visual resources – Indianapolis and Noblesville

  All actions proposed for the Indianapolis and Noblesville facilities would be in existing industrial facilities. No changes are expected in how the public would perceive the appearance or manner of use of these buildings. Actions at the Greenfield facility would

require minor exterior construction and changes in the appearance of the existing building, so this EA addressed aesthetics and visual resources for that location.

- Air quality – Noblesville

  Activities would be expanded at the Noblesville location, but these activities would involve only minor amounts of air emissions produced by heating the building. Air quality is addressed for both of the other locations.

- Biological resources – all locations

  With only a minor exception, all actions would occur in existing facilities and there would be no expected changes in potential impacts to biological resources. The minor amount of construction at the Greenfield facility would occur adjacent to the building, in an area already disturbed by previous construction. In its comments on the Draft EA, the Bloomington Field Office of the U.S. Fish and Wildlife Service concurred that the proposed project would not be likely to adversely affect threatened or endangered species. See Section 1.5 for a summary of that comment.

- Cultural resources – all locations

  With only a minor exception, all actions would occur in existing facilities and there would be no expected changes in potential impacts to any historical, archaeological, or cultural sites. The minor amount of construction required adjacent to the Greenfield building would occur in an area already disturbed during previous construction. In its comments on the Draft EA (Section 1.5), the State Division of Historic Preservation and Archaeology agreed that no archaeological investigations appeared necessary, provided all project activities remained within areas disturbed by the previous construction. The State also identified a nearby property that might qualify for the National Register of Historic Places, but concurred that the project would not affect qualifying characteristics of that property. Based on its review of the proposed project and information provided by the State Division of Historic Preservation and Archaeology, DOE determined that no historic properties would be affected.

- Environmental justice – all locations

  The proposed project would not result in any significant adverse impacts to any group, so there would be no disproportional adverse impacts to low-income or minority groups.

- Geology and soils – all locations

  With only a minor exception, all actions would occur in existing facilities and no actions would result in impacts to geology or would be unduly affected by geological instabilities. With respect to soils, the proposed expansions at Indianapolis and Noblesville would be

inside existing buildings, so there would be no construction impacts to soils, and the actions would not result in any changes to erosion potential for the areas. The proposed Greenfield activity is the exception because it would include minor construction outside of the building to install a pad and equipment. This would occur next to the building in areas already disturbed by previous construction.

- Water resources

  – Groundwater – all locations

    None of the proposed activities would involve discharge of liquids or other materials that could affect groundwater, and water needs would be obtained from municipal or private services and are, therefore, addressed under utilities.

  – Surface water – Indianapolis and Noblesville

    The proposed expansions at the Indianapolis and Noblesville locations would occur inside existing buildings, so no changes to runoff characteristics would be expected. The action would involve no discharges of waste or wastewater to the surface or to surface water. Surface water is addressed for the Greenfield location.

  – Floodplains – all locations

    With the exception of minor exterior construction at Greenfield, all actions would occur in existing facilities and none of the three facilities is located in floodplains or flood zones.

  – Wetlands – all locations

    With the exception of minor exterior construction at Greenfield, all actions are in existing facilities and none of the three facilities is identified as being associated with wetlands.

- Occupational health and safety – all locations

  The industrial processes performed at the three facilities would pose no unusual hazard or risk to the public. Materials and chemicals that would be used in the processes do not pose unusual or unacceptable risks for accidental spills or releases. The solvent n-methylpyrrolidone (NMP) is the liquid chemical of highest use in the processes. A textbox in Section 2.2.1 describes its general toxicity characteristics, and Section 3.3.6 provides further discussion of its potential for release to surface water. There would be no unusual or potentially unacceptable hazards or risks to workers, who would be trained to operate under a safety program and procedures. The proposed industrial activities would be the same as those currently being performed in the existing EnerDel facilities.

- Land use – all locations

With the exception of minor construction in already disturbed land at Greenfield, the activities would occur inside existing buildings. There would be no changes to existing land use.

- Noise – all locations

  There would be no new construction at the Indianapolis and Noblesville locations and the industrial processes performed at those two facilities would not present noise hazards or annoyances for the public (that is, would not add to ambient noise levels). Construction required at the Greenfield location would be minor, and the industrial processes performed at the facility would similarly present no noise hazards or annoyances to the public. Hearing protection would be required of workers inside the facilities as appropriate.

- Utilities, energy, and materials

  – Materials – all locations

    There would be materials committed under the proposed expansions at each location in the form of new equipment acquired for the facilities and an increased amount of materials used in the manufacture of batteries. However, EnerDel has indicated that none of the materials required would come from a limited resource or have limited availability in the world market. Utilities and energy are addressed for each location.

1.5 Public-Comment Response Process

DOE issued the Draft EA for comment on January 9, 2010, and advertised its release in *The Indianapolis Star* on January 9, 12, and 13, 2010. In addition, the Department made the Draft EA available for public review by posting it on the National Energy Technology Laboratory's web site, http://www.netl.doe.gov/nepa/EA-1710.pdf, and by sending copies to three libraries in Indiana: the Marion County Public Library, Lawrence Branch, in Indianapolis; the Hamilton County East Public Library in Noblesville; and the Hancock County Public Library in Greenfield. The Department established a 30-day public comment period that began January 9, 2010, and ended February 8, 2010. The Department announced it would accept comments by mail, email, or fax. DOE received two comment letters and one email from two entities, summarized as follows:

United States Department of the Interior, Fish and Wildlife Service, Bloomington Field Office, Bloomington, Indiana
Scott E. Pruitt, Field Supervisor

Comment: The Bloomington Field Office of the U.S. Fish and Wildlife Service indicated that, based on the lack of new construction, it did not anticipate significant impacts on wildlife habitat at the Indianapolis, Noblesville, or Greenfield sites, provided that hazardous waste materials were properly contained and, at the Greenfield site, the Buck Creek stream reach was protected. With respect to the Greenfield facility, the Field Office recommended mitigation measures

consisting of "state-of-the-art containment facilities for all hazardous material storage areas" and establishing a 50-foot-wide riparian buffer along both sides of Buck Creek, with planted trees and shrubs, to stabilize the stream and enhance aquatic and terrestrial habitat. The Field Office further noted that the proposed Greenfield activity is within the range of the federally endangered Indiana bat (*Myotis sodalist*), but concurred that the activity would not be likely to adversely affect this listed species and that further consultation under Section 7 of the Endangered Species Act of 1973, as amended, is not necessary provided project plans are not changed significantly.

Response: This EA describes EnerDel's use of secondary containment for areas where liquid hazardous materials are stored outside of buildings. With respect to the solvent, n-methylpyrrolidone (NMP), which is used in relatively high quantities in the manufacturing process, the truck loading and unloading area at the Greenfield facility would also drain to a containment structure so that no accidental leaks or spills during transfers could leave the site or be carried away by precipitation runoff. The new storage areas at the Greenfield facility have not yet been designed, but EnerDel would ensure they meet all applicable regulatory requirements for the storage of hazardous waste or materials and be consistent with or exceed standard industrial practice.

The design of the property development (known as Axcess 70) near Greenfield includes storm detention ponds to control the flow of precipitation runoff from the built up areas of the property. These detention ponds would flow to Buck Creek, which is not actually within the parcel that contains the proposed EnerDel facility. According to Hancock County records and site plans posted by the land developer, the overall development comprises several separate parcels; Buck Creek runs through a parcel in the southeast corner. EnerDel has leased the facility described in this EA, with a two-year option to purchase. This facility is in the parcel adjacent to the one through which Buck Creek flows. EnerDel would have no control over other parcels of property in the development and would be unable to commit to any mitigation measures along Buck Creek. It should be noted, however, that the Bloomington Field Office's recommendation for mitigation along Buck Creek was based on "recent aerial photographs," in which the applicable section of stream appears lacking in riparian vegetation. This can be seen in Figure 2-5 in Chapter 2 of this EA, which shows the same feature as that described in the comment; that is, the portion of Buck Creek crossing through the southeast corner of the site has notably less dark vegetation than on either end of the stream section. More recent ground views of the site (reflective of recent construction activity, compared with Figure 2-5, which shows the parcel before construction started) show relatively heavy vegetation within and along the sides of the stream channel in the applicable stretch, including bushes or young trees establishing themselves at the top of the bank. Site plans posted by the developer do not identify specific intentions for this parcel of property, but it appears riparian vegetation is present and healthy along the creek, just in a more narrow strip of land than to the northeast and southwest.

Indiana Department of Natural Resources, Division of Historic Preservation and Archaeology, Indianapolis, Indiana
James A. Glass, Ph.D. Deputy State Historic Preservation Officer

Cathy Draeger-Williams, Archaeologist

Comment: The Indiana Division of Historic Preservation and Archaeology first asked (via email) for more detailed information about building locations. Specifically, the commenter asked about the availability of maps showing the locations of buildings within the Axcess 70 development, as well as ground or aerial photographs showing the current facility.

The commenter subsequently provided a letter (via U.S. Mail) response to DOE's request for comments on the Draft EA. The letter noted that there were two archaeological sites recorded within or adjacent to Building 1 near Greenfield (Figure 2-5 of this EA). The letter also stated that these sites were "probably substantially disturbed" by the previous site development and building construction activities, but that no archaeological investigations appeared necessary for the proposed project, provided activities remained within areas disturbed by the previous activities. The comment further identified a single property within the probable area of potential effects that might meet eligibility for inclusion in the National Register of Historic Places: Site # 059-144-15022 (John Eastes Farm, 300 N., Hancock County). The commenter indicated that, based on the information reviewed, it appeared the proposed project would not result in any alterations to the characteristics of the identified historic property qualifying it for inclusion in the National Register.

Response: DOE was unable to locate publicly available aerial photographs showing the newly constructed buildings within the Axcess 70 development site, but did locate site drawings prepared by the site developer showing the relative locations of the existing and planned construction within the site (Browning n.d.). DOE provided this information to the State Archaeologist. As a result of this comment, DOE modified Figure 2-5 to show the relative locations of the buildings within the development site. In modifying the original figure, it was noted that the bar scale on the figure in the Draft EA was wrong; the modified figure includes the corrected scale.

In response to the second part of the comment, DOE added text to Section 1.4, describing the information provided by the State Division of Historic Preservation and Archaeology, which supported its determination that no historic properties would be affected by the proposed project.

2. DOE PROPOSED ACTIONS AND ALTERNATIVES

This chapter describes DOE's proposed actions, EnerDel's proposed project (Section 2.1), the No-Action Alternative (Section 2.2), the bases for not considering other alternatives (Section 2.3), and EnerDel's process alternatives (Section 2.4).

DOE's Proposed Actions

DOE's Proposed Action under the Vehicle Technologies Program is to provide a grant to partially fund expanded manufacturing of advanced lead-acid batteries for the EnerDel proposed project in Indiana. DOE would award a Recovery Act grant to provide $118.5 million in financial assistance in a cost-sharing arrangement with EnerDel. DOE's Proposed Action under the State Energy Program (SEP) is to permit Indiana to use $5 million of SEP funds appropriated under the Recovery Act for a loan to EnerDel to purchase equipment for this same expansion since it furthers the goals of the SEP. Finally, DOE's Proposed Action under its Advanced Technology Vehicle Manufacturing Incentive Program is to provide EnerDel with a loan for this expansion of its lithium-ion battery manufacturing capability.

2.1 EnerDel's Proposed Project

EnerDel's proposed project involves expansion of its manufacturing and testing capabilities at two existing facilities and starting up a third facility for future development into a complete lithium-ion battery manufacturing plant. The existing EnerDel facilities consist of a 92,000-square-foot building in Indianapolis and a 32,000-square-foot building in Noblesville, just north of Indianapolis. The lithium-ion battery manufacturing capacity of the Indianapolis facility would increase through the addition of equipment, and the Noblesville location would transition into full use as a prototype development and battery testing facility through the addition and change-out of equipment. The exteriors of the Indianapolis and Noblesville facilities would be unchanged. The third facility is a newly acquired vacant warehouse near Greenfield, Indiana, just east of Indianapolis. This 423,000-square-foot building would require minor construction and equipment installation on the exterior of the building; however, essentially all of the work necessary to transform it into a manufacturing plant would consist of installation of equipment inside the building.

Figure 2-1 is a schematic of the process EnerDel uses in its production of battery packs. The primary elements of the cell manufacturing process are electrode coating, cell assembly, and final assembly and formation. These processes are currently performed in the Indianapolis facility. The system integration, or pack assembly action, is currently performed in the Noblesville facility and includes testing of the battery packs. Using this process flow, EnerDel is able to manufacture systems that are scalable for applications from light electric vehicles to heavy-duty transportation. EnerDel also has cell designs appropriate for hybrid electric vehicles—which require power performance—and for plug-in hybrid electric vehicles and electric vehicles—both of which require batteries with blended characteristics of power and energy performance.

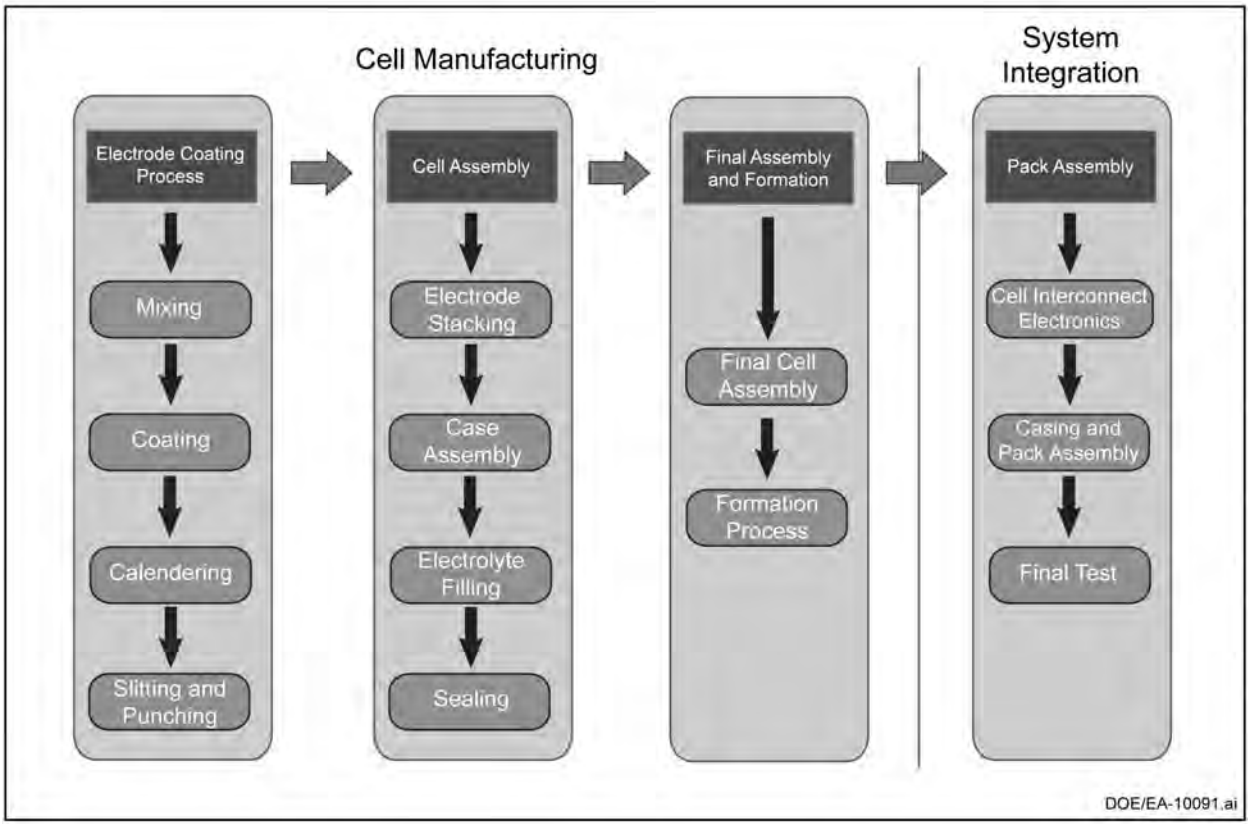

Figure 2-1. Work flow process used by EnerDel in the manufacture of lithium-ion batteries**.**

EnerDel plans to expand its existing manufacturing capabilities through the following actions:

- Cell manufacturing capabilities at EnerDel's existing Indianapolis facility would be expanded through the installation of new, state-of-the-art manufacturing equipment.

- Pack prototype builds and testing capabilities would be expanded at EnerDel's existing Noblesville facility through the installation of new equipment.

- Additional cell manufacturing and pack assembly capacity would be developed by obtaining and outfitting a new third facility, already constructed and located near Greenfield, Indiana.

EnerDel's objective, with these new and expanded capacities, is to increase its current capability of producing about 10,000 electric vehicle batteries per year to a manufacturing capability of about 60,000 batteries per year by 2013. (Other battery types, including hybrid and plug-in hybrid vehicle batteries, involve different numbers of cells than electric-vehicle batteries and, as a result, would be associated with different manufacturing capacities were they being produced.) In addition to the physical actions of adding new equipment and a new facility, EnerDel plans to take other actions as part of this project to ensure the successful growth of its capacity. Some of these actions include pursuing a partnership with Purdue University to create computer modules to optimize cell and pack design; establishing approaches for hiring and training new personnel,

which would be required for increasing an existing workforce of about 160 individuals to about 1,600 in 2013; establishing qualification processes for suppliers and materials to ensure the quality of the manufactured products; implementing recognized national standards and quality management systems; and other actions required for EnerDel to become a Tier 1 supplier, providing automotive batteries directly to the original equipment manufacturer.

The three facilities that would make up the expanded EnerDel manufacturing capability are described further in the following sections. The descriptions target those elements of the facilities that could be associated with potential environmental impacts or effects. Many of EnerDel's planned actions described above are purely administrative and would not be expected to have any environmental concerns, so they are not addressed further in this document.

Figure 2-2 shows the relative locations of the three EnerDel facilities. Although each would be in a different city, and each in a different county, they all fit within a 7-mile radius.

2.1.1 INDIANAPOLIS FACILITY

The EnerDel facility in Indianapolis, Marion County, Indiana is located in the northeast section of the city, outside the U.S. Interstate 465 (I-465) Beltway and adjacent to the east side of I-69. The 92,000-square-foot facility is on Hague Road between East 86th Street to the south and East 88th Street to the north (Figure 2-3). The EnerDel facility is positioned in the central portion of a commercial-industrial area, with the nearest residential areas almost 0.2 mile to the south and about 0.4 mile to the east. To the immediate east is a church, its parking lot, and recreational field, all of which are between the EnerDel facility and the residential areas.

EnerDel's Indianapolis facility currently contains battery cell manufacturing lines and associated equipment. In terms of potential for environmental impacts, the activity of primary interest is the initial electrode coating process. In this process, the cathode (copper) and anode (aluminum) materials are coated with a paste, which includes a binder and solvent, and sent through an oven for drying. When the powder is first mixed to form the paste, there is potential for particulates to be emitted; therefore, ventilation air from the mixing tanks is collected and exhausted through a baghouse located on the exterior of the building. When powder is added to the mixing vessels, the ventilation system and baghouse are turned on. Next, the coated metals pass through a drying oven, where the organic solvent in the coating is driven off. The exhaust from this process is sent through a wet scrubber, also located on the exterior of the building. Last, the coated cathode and anode materials are rolled, shaped, cut, and stacked to first form the cells and then the battery modules.

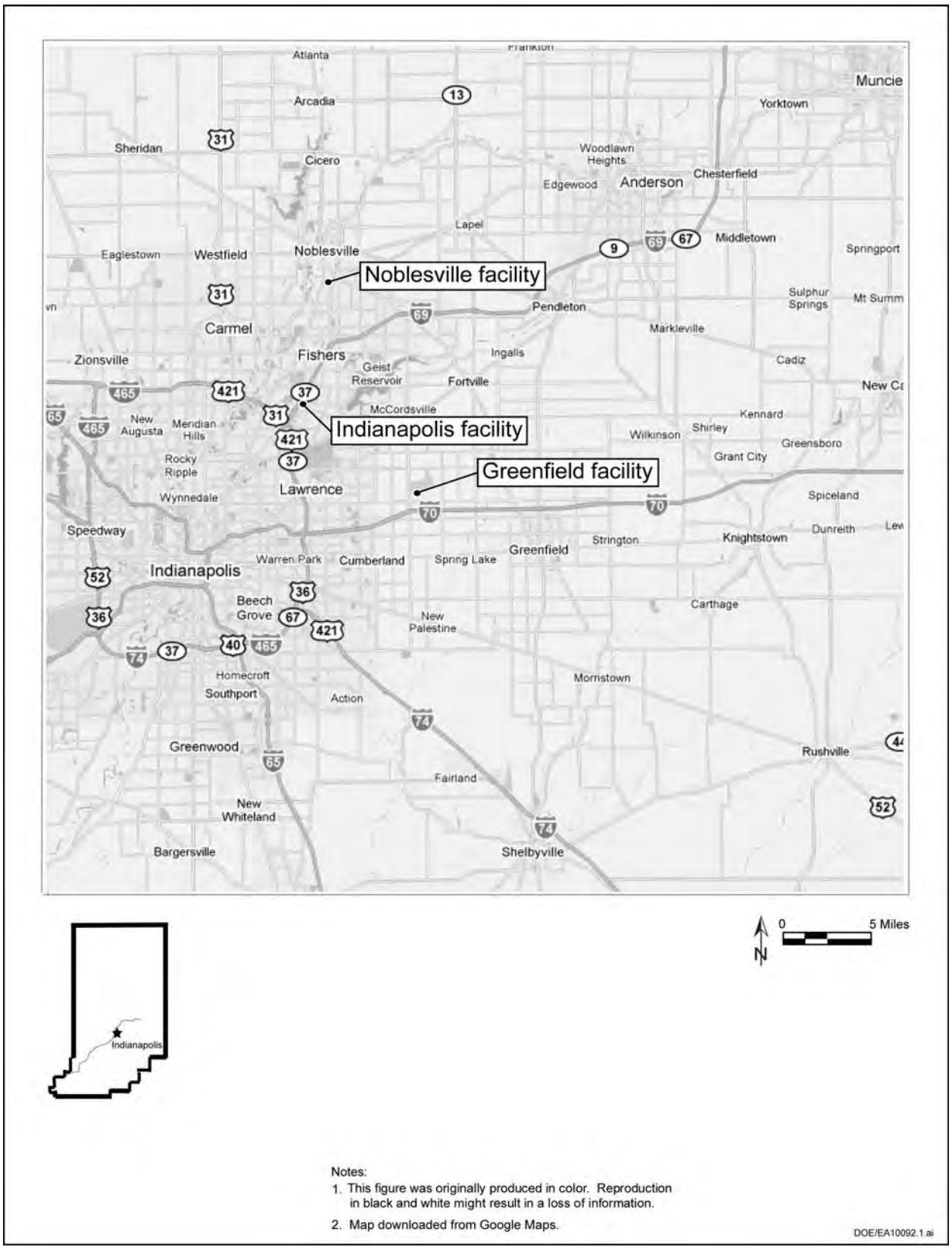

Figure 2-2. Map of Indianapolis area showing approximate locations of the EnerDel facilities.

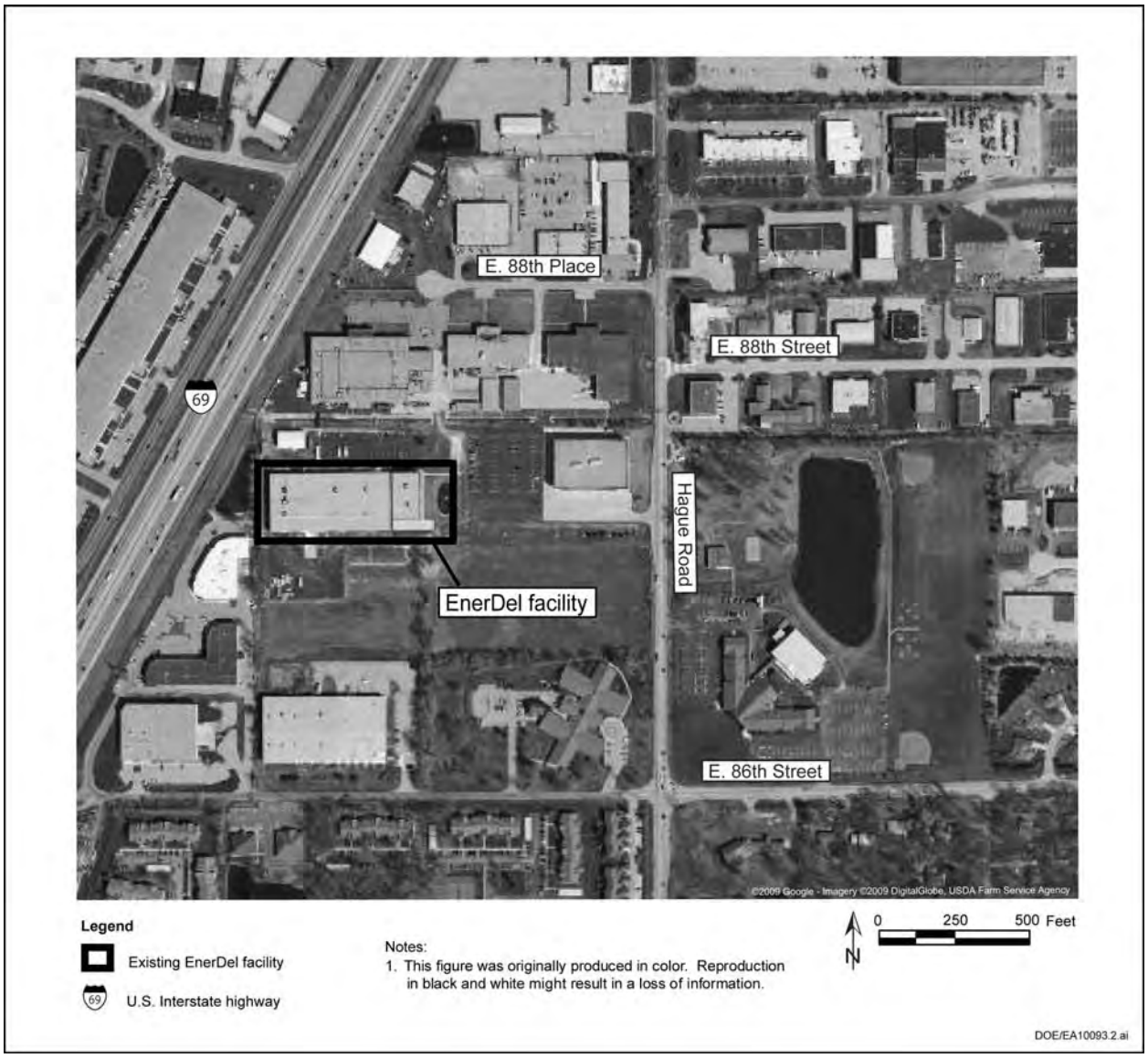

Figure 2-3. Aerial photograph of area surrounding EnerDel's Indianapolis facility.

The solvent used in the coating process is n-methylpyrrolidone (NMP), which also is used to periodically flush out process lines and for other cleaning purposes. A small tank farm is located outside the building within a secondary containment and under a roof (but no walls) to support the use of NMP and its subsequent collection as waste. The tank farm contains three primary tanks: a storage tank with a capacity of about 2,000 gallons that is plumbed to receive waste NMP from process line flushes and from a specific sink inside the building, and two tanks of about 15,000 gallons each, one that receives effluent (NMP and water) from the wet scrubbers and one used to store new, unused NMP (DPW-OES 2008). The wet scrubber is under the same roof structure as the tank farm, with its 20-foot stack extending up through the roof.

N-METHYLPYRROLIDONE

N-Methylpyrrolidone (NMP) is a water-miscible organic solvent widely used in the petrochemical industry, in fabricating microelectronics, and in manufacturing compounds such as pigments, cosmetics, pesticides, floor cleaners, and paint removers. NMP increasingly is used as a substitute for chlorinated hydrocarbons, which are more toxic to the environment and human health.

NMP has low acute toxicity, is potentially irritating to the skin and eyes and at high aerosol concentrations can cause respiratory tract irritation. It is readily absorbed through the skin which, along with inhalation, represents the primary exposure routes for humans. As with other organic solvents, breathing excessive amounts of NMP can affect the brain and result in temporary headaches, nausea, dizziness, clumsiness, drowsiness and other effects similar to intoxication. Testing on animals has not shown a link to cancer that can be related to human exposures. However, NMP has been shown to cause effects, such as delayed growth, to offspring of animals exposed during pregnancy. As a result of these types of test results, the State of California has identified NMP as a reproductive toxin and has established maximum allowable dose levels of 17,000 and 3,200 micrograms per day for dermal contact and inhalation exposures, respectively. Products that could result in daily exposures exceeding these levels must carry an appropriate label under California law.

In the proposed expansion, the cell manufacturing capacity of the Indianapolis facility would increase primarily through the installation of a second electrode coating line within the footprint of the existing building. With the exception of the addition of a second wet scrubber, the identified air emissions controls and the small tank farm are already sized to accommodate this second coating line, so this equipment would not change, though throughput would increase. It is estimated that the workforce at the Indianapolis facility would increase from the present level of about 120 workers to about 330 workers in 2013.

2.1.2 NOBLESVILLE FACILITY

The EnerDel facility in Noblesville, Hamilton County, Indiana is located in the southern portion of the city, about 7 miles north-northeast of the Indianapolis facility on Hague Road. The almost 32,000-square-foot Noblesville facility is situated on Herriman Boulevard in an industrial-commercial area that starts at East 146th Street and extends north about 1 mile, bordered on the east by Huntington Avenue (Highway 37) and on the west by a railroad track (Figure 2-4). The width of the industrial-commercial area ranges from one-quarter to one-third mile. There is agricultural land to the east of the industrial-commercial area, across Huntington Avenue. Residential areas border the industrial-commercial area on the west (across the railroad track) and the north, and there is additional industrial-commercial area immediately to the south, across East 146th Street. The EnerDel facility is in the north-central part of the industrial-commercial area and is about 700 feet from the residential area to the north and about 900 feet from the residential area to the west.

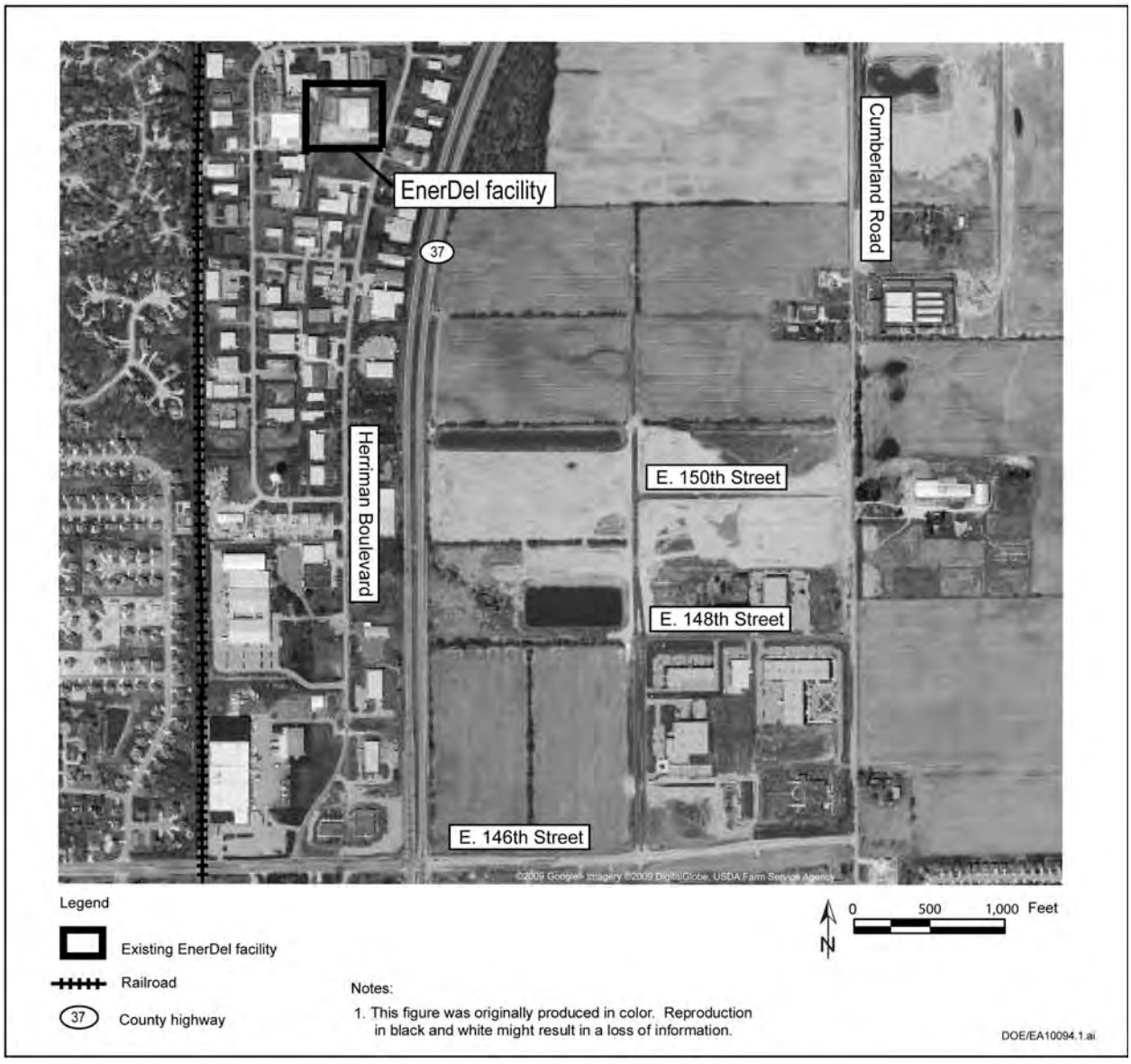

Figure 2-4. Aerial photograph of area surrounding EnerDel's Noblesville facility.

As noted previously, EnerDel's Noblesville facility currently runs its pack assembly operations. Battery modules produced in the Indianapolis facilities are assembled along with interconnects and electronics to produce the end-product battery packs. The battery packs are also tested at the Noblesville facility. The manufacturing activities performed at this facility are relatively benign with respect to potential environmental impacts. There are no specific process emissions or discharges of concern. Rather, potential impacts from the Noblesville facility are primarily due to the presence of the workforce and the associated use of water, production of sanitary wastewater, and production of municipal solid waste.

Under the proposed expansion, operations at the Noblesville facility would change to a fully utilized battery testing facility. The existing system integration activities and associated

equipment would be moved from Noblesville to the new facility near Greenfield (Section 2.2.3). New equipment that would be installed in the Noblesville facility would enable full use for building prototype batteries and testing batteries. The applicant estimates the workforce at the Noblesville facility would increase from a present level of about 40 workers to about 160 workers in 2013.

2.1.3 GREENFIELD FACILITY

The building that would be EnerDel's Greenfield facility is a recently constructed 423,000-square-foot warehouse facility. Although EnerDel designates it the Greenfield facility, it is actually located adjacent to I-70 (near Exit 96), about 7.5 miles northwest of the center of Greenfield, Hancock County, Indiana. The facility is close to the unincorporated community of Mount Comfort (also in Hancock County) and is positioned between the small Mount Comfort airport, about 0.7 mile to the north, and I-70, about 0.7 mile to the south (Figure 2-5). The center of Indianapolis is about 13 miles west from the Greenfield facility location and EnerDel's Indianapolis facility is about 9 miles to the northwest (Figure 2-2).

The Greenfield facility is in a rural-agricultural area with some scattering of industrial-commercial developments. With its close proximity to the metropolitan area of Indianapolis and the access provided by I-70, it is among areas gradually being lost to commercialization. Proximity and access to Indianapolis were selling points advertized for the recently built-up area in which the building targeted by EnerDel was constructed. This 150-acre area, designated "Axcess 70 Industrial Park" by its developer, is bordered on the south and east by West 300 North and North 500 West, respectively, and is the planned location of three large buildings. Building 1, which is the facility targeted by EnerDel, and Building 2, about half the size of the first, have already been erected. Building 3 is planned for the future and will be the largest building, about twice that of Building 1. EnerDel would not use Building 2 or Building 3.

The 150-acre Axcess 70 site is bordered on the north by agricultural land that extends as far as the Mount Comfort airport. Property to the east and south is also agricultural, although there are low-density residential areas across West 300 North to the southeast and southwest. The Mount Comfort Elementary School is on the tract of land immediately west of the Axcess 70 site. Building 1, located in the southeast portion of Axcess 70, is about 0.3 mile from the school, and Building 2 lies in between.

EnerDel plans to develop the Greenfield location into a full battery manufacturing facility, with cell manufacturing and system integration capabilities (Figure 2-1). It would also have enough room to provide warehouse space for materials and products. It is expected that employment in the Greenfield facility would become significant in 2010 and that the number of workers would grow steadily through 2013, when there would be a workforce of about 1,140 workers at this facility.

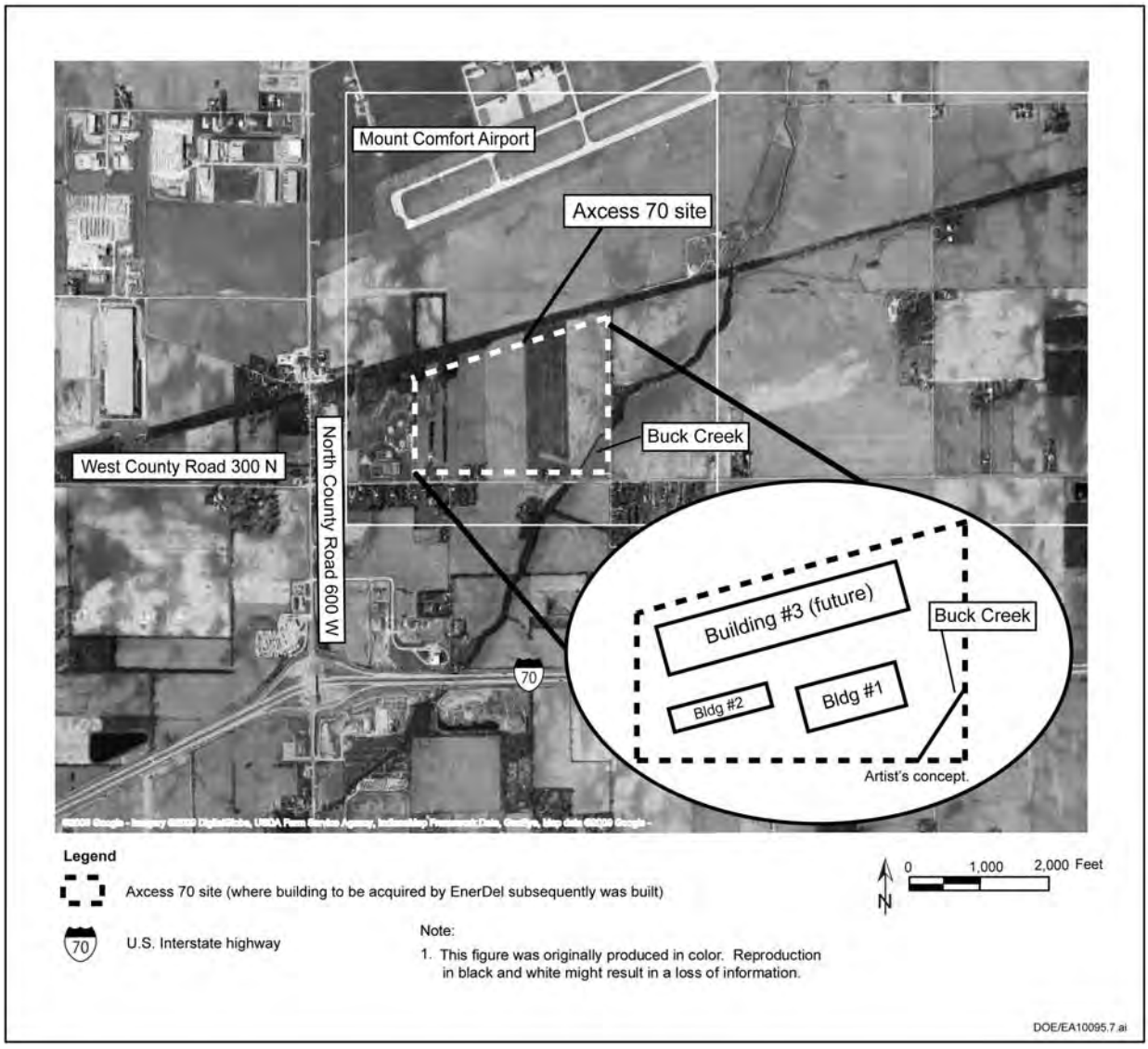

Figure 2-5. Aerial photograph of area surrounding the commercial development (Axcess 70) where EnerDel's Greenfield facility is located (taken before the start of construction).

As described in the discussion of the Indianapolis facility, the process of primary concern with regard to potential environmental impacts would be the initial electrode coating process. It is anticipated that this process would be the same as that described for the Indianapolis facility; whereas the Indianapolis facility would be expanded to include two of the coating lines, the Greenfield location would be developed to eventually contain six coating lines. The emissions control equipment (baghouse and wet scrubbers) and small tank farm described for the Indianapolis facility would also be installed at the Greenfield location and with added capacity. At the present time, it is expected that this would be done by using twice the number of items present at the Indianapolis facility (where they are sized for two coating lines once the second wet scrubber is added), but with items of slightly larger capacity. For example, there might be two separate tank farm elements set up outside the building in locations that would best fit the

interior positions of the coating lines, and there would be three tanks in each tank farm, but their sizes would be slightly larger than those at the Indianapolis facility.

Installation of the tank farm and emissions control components of the process is expected to be the only construction or construction-like activity performed outside of the Greenfield facility. These components would be located adjacent to existing exterior walls, and the construction actions would be in areas already disturbed during construction of the building. All other activities required to develop the facility into a battery manufacturing complex are expected to take place within the existing building and would consist primarily of installing equipment and setting up the process lines.

2.2 No-Action Alternative

Under the No-Action Alternative, DOE would not provide a grant or loan to EnerDel for its proposed project, and would not allow Indiana to use its SEP funds for such purposes. As a result, the expansion would be delayed while EnerDel looked for other funding sources or abandoned if EnerDel could not obtain other financing. Furthermore, acceleration of the development and production of various electric-drive vehicle systems would not occur or would be delayed. DOE's ability to achieve its objectives under the Vehicle Technologies Program, the Advanced Technology Vehicle Manufacturing Incentive Program, and the Recovery Act would be impaired, as would Indiana's ability to use its SEP funds for energy efficiency and renewable energy activities.

Although this project might proceed if DOE decided not to provide one or more form of financial assistance, DOE assumes for purposes of this environmental analysis that it would not proceed without this assistance. If the project did proceed without DOE's financial assistance, the potential impacts would be essentially identical to those under DOE's proposed actions (that is, providing assistance that allows the project to proceed). In order to allow a comparison between the potential impacts of a project as implemented and the impacts of not proceeding with a project, DOE assumes that if it decided to withhold assistance from this project, EnerDel's expansion would not proceed.

2.3 Alternative Actions

DOE's alternatives to this proposed project consist of the 45 technically acceptable applications it received in response to the Funding Opportunity Announcement, *Recovery Act - Electric Drive Vehicle Battery and Component Manufacturing Initiative.* Prior to selection, DOE made preliminary determinations regarding the level of review required by NEPA based on potentially significant impacts identified in reviews of acceptable applications. DOE conducted these preliminary environmental reviews pursuant to 10 CFR 1021.216 and a variance to certain requirements of this regulation granted by the Department's General Counsel (74 FR 30558, June 26, 2009). These preliminary NEPA determinations and environmental reviews were provided to the selecting official, who considered them during the selection process.

Because DOE's Proposed Action under the Vehicles Technologies Program is limited to providing financial assistance in cost-sharing arrangements to projects submitted by applicants in response to a competitive funding opportunity, DOE's decision is limited to either accepting or rejecting the project as proposed by the proponent, including its proposed technology and selected sites. DOE's consideration of reasonable alternatives is therefore limited to the technically acceptable applications and a No-Action Alternative for each selected project.

DOE's alternatives to its Proposed Action for the Advanced Technology Vehicle Manufacturing Incentive Program consist of denying EnerDel a loan under this program and using the money for loans to subsequent applicants. This alternative is equivalent to the No-Action Alternative described below.

DOE's alternatives to its Proposed Action relating to Indiana's use of Recovery Act SEP funds are limited to prohibiting Indiana from providing EnerDel with a loan of $5 million and waiting for Indiana to propose another use for these funds for DOE's review and consideration. This alternative is equivalent to the No-Action Alternative described below.

2.4 Process Alternatives

With regard to the lithium-ion battery production actions described in this document, EnerDel identified no design or operational variations that would result in the need to evaluate and select among alternatives. Therefore, the only alternatives evaluated in this EA are the proposed actions described in Sections 2.1 and 2.2 and the No-Action Alternative described in Section 2.4 above. In addition, the two EnerDel facilities described in Sections 2.2.1 and 2.2.2 are existing manufacturing facilities already owned or controlled by EnerDel and do not require alternative siting evaluations. Similarly, the Greenfield facility described in Section 2.2.3 is an existing building and EnerDel has made an evaluation and decision to pursue this site over other locations that may have been available.

3. AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

This chapter provides descriptions of the affected environment and environmental impacts for each of the EnerDel facility locations (Indianapolis, Noblesville, and Greenfield). Only those environmental topics or resource areas identified in Section 1.4 for evaluation are discussed in this section. In each of the location discussions, the resource areas common to all three locations are addressed first in order to keep subsection numbering consistent. Resource areas not common to each of the locations are then presented.

3.1 Indianapolis

The environmental resource areas described and evaluated for the Indianapolis location are (1) socioeconomics; (2) utilities, energy, and materials; (3) waste; (4) transportation; and (5) air quality. The first four resource areas are common for all three locations.

3.1.1 SOCIOECONOMICS

3.1.1.1 Affected Environment

The U.S. Office of Management and Budget has designated Indianapolis-Carmel as a Metropolitan Statistical Area (MSA) with Indianapolis as the principal city. The Indianapolis-Carmel MSA includes the ten counties (Figure 3-1) of Boone, Brown, Hamilton, Hancock, Hendricks, Johnson, Marion, Morgan, Putnam, and Shelby (OMB Bulletin No. 09-01, November 20, 2008, for example). All three EnerDel locations are within this MSA; that is, Indianapolis is in Marion County, Noblesville is in Hamilton County, and the Greenfield facility is in Hancock County.

METROPOLITAN STATISTICAL AREA

An area of one or more adjacent counties or county equivalents that have at least one urban core area with a population of at least 50,000 people, plus adjacent territory that has a high degree of social and economic integration with the core as measured by commuting ties.

Because all three of the EnerDel locations are within the same MSA, it is appropriate to consider all of the actions as affecting the same socioeconomic environment. This EA addresses potential impacts at both the MSA level (with all three actions considered) and at the county level (for each individual location).

Table 3-1 provides key socioeconomic indicators for the Indianapolis-Carmel MSA as well as for the three counties where the EnerDel facilities would be located. The data represent that most recently available from the U.S. Census Bureau and, for the percent unemployment, from the U.S. Bureau of Labor Statistics. It should be noted that values shown in the table for the

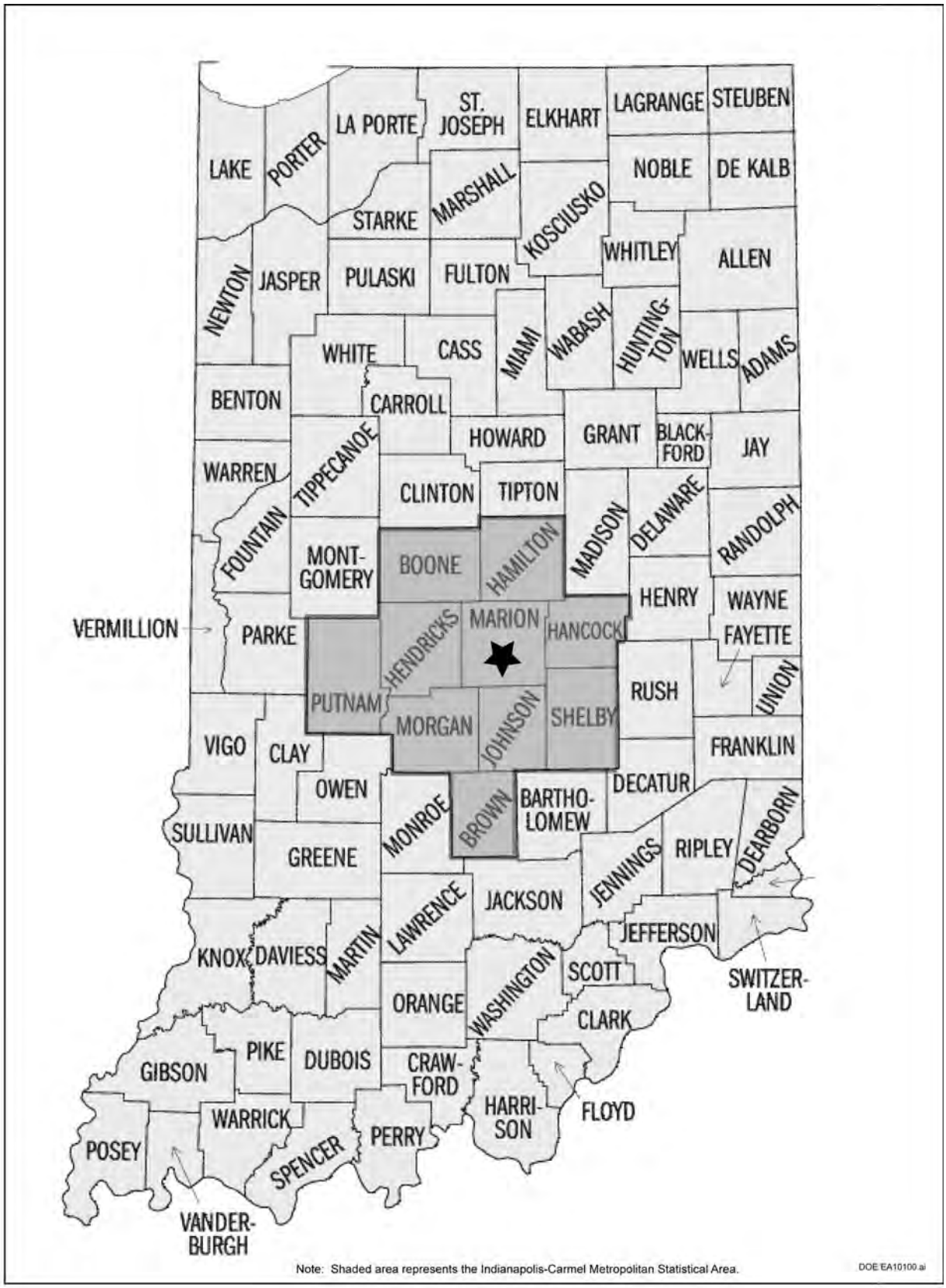

Figure 3-1. Indiana counties (shaded) in the Indianapolis-Carmel MSA.

MSA represent the totals of values for all ten counties, though only three of those contributing are shown in the table. As can be seen in the table, Marion County, with the city of Indianapolis, contains about half of the MSA population and civilian labor force. It can also be seen that Marion County represents well over half (at about 63 percent) of the MSA's output (that is, total sales, shipments, receipts, and revenue). This is consistent with industrial and commercial activities being focused in the Indianapolis area of Marion County.

Table 3-1. Key socioeconomic indicators for the Indianapolis-Carmel MSA and the three counties where the EnerDel facilities are located.

Geographical area	2008 Population[a]	2002 Output (in millions)[b]	2006 Income (in millions)[c]	2005-2007 Labor force[d]	September 2009 unemployment[e]	
					Percent	Workers
Indianapolis-Carmel MSA - ten counties, including	1,715,000	$78,500	$63,000	881,000	7.7	68,600
Hamilton County	270,000	$10,200	$11,500	136,000	7.7	10,500
Hancock County	67,300	$2,500	$2,000	35,000	7.7	2,700
Marion County	880,000	$49,400	$32,700	459,000	7.7	35,400

a. Source: USCB 2008.
b. Source: USCB 2002. The value shown for the MSA was obtained from summing the values for the 10 individual Indiana counties that make up the MSA.
c. Source: USCB 2006.
d. Source: USCB 2007. The value shown for the MSA was obtained from summing the values for the 10 individual Indiana counties that make up the MSA. A labor force for Brown County was not available due to its small population, so a value was estimated using the average labor force-to-population ratio from the other nine counties.
e. Source: BLS 2009. The Bureau of Labor Statistics source provided percent unemployment and number of unemployed workers at the MSA level, but did not provide the numbers for the counties. The most recent unemployment data available at the county level were averages for 2008. Since unemployment has increased since then, the up-to-date unemployment rate for the MSA was assumed to be applicable to the component counties, and the number of unemployed workers was estimated by multiplying the labor forces shown in the table by the unemployment rate.

MSA = Metropolitan Statistical Area.

The number of unemployed workers shown in Table 3-1 for the counties should be considered a rough estimate, as the data were generated by multiplying the 2005 to 2007 labor force by the unemployment rate (7.7 percent) reported for the entire MSA. The current labor force would be expected to be slightly larger than that shown. Further, the county unemployment rates generally vary from one to another, with the most industrialized (Marion County) having larger unemployment rates. The rate shown for the entire MSA can be considered the weighted average of the counties that make up the MSA.

3.1.1.2 Environmental Consequences

3.1.1.2.1 *Proposed Project*

This section addresses potential socioeconomic impacts associated with the proposed expansion at the Indianapolis, Marion County, location. Because all three of the EnerDel facilities are

within the same MSA, this section also addresses overall socioeconomic impacts at the MSA level.

Socioeconomic Impacts at the County Level

Figure 3-2 shows the estimated changes in workers and annual wages anticipated for the Indianapolis location. The values for 2009 represent the current conditions at that location. In 2010 it is expected that the workforce at the Indianapolis facility would remain at levels similar to the present or, as shown in the graph, even decrease slightly as existing employees were moved around to support startup of the new facility near Greenfield. As shown in the graphs, after 2010, EnerDel anticipates a relatively steady increase to the 2013 levels, when there would be about 330 people working at the Indianapolis facility with annual wages (without fringe benefits) totaling about $13 million.

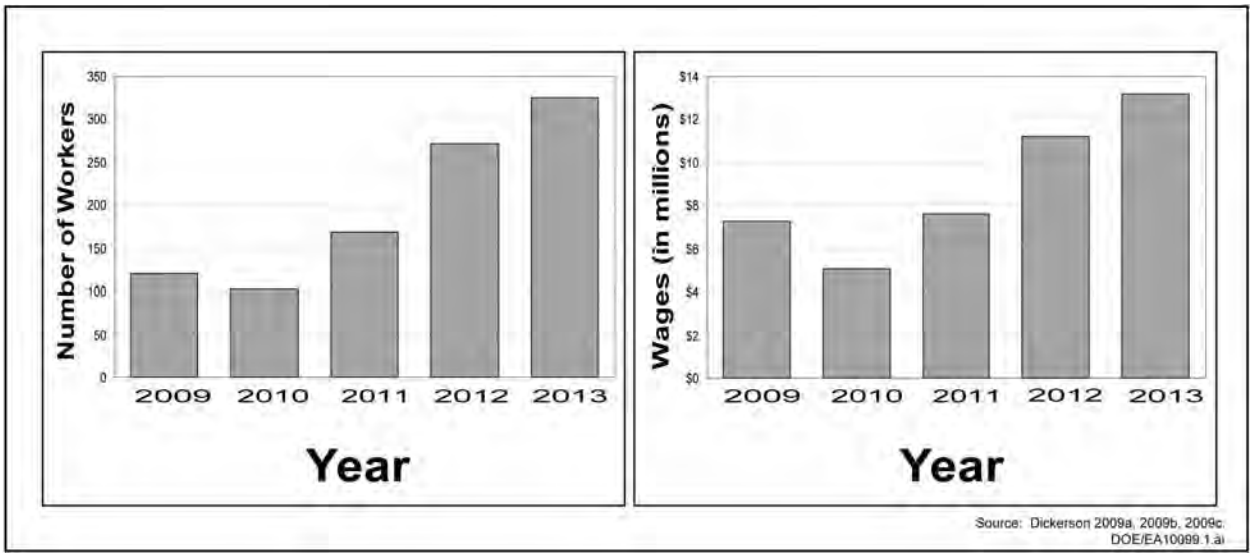

Figure 3-2. Graphs of workers and total wages anticipated for the Indianapolis facility from 2009 (current conditions) through 2013.

The increase of about 210 workers in the Indianapolis location by 2013 represents only about 0.05 percent of the Marion County workforce (Table 3-1) and about 0.6 percent of the unemployed workers in Marion County. Although the added jobs represent beneficial numbers, they are very small in comparison with the overall County numbers. With the number of people that will likely be looking for work, it is expected that most of the added workers would come from within the county or in nearby areas. As a result, DOE expects impacts associated with in-migration to be minor.

Increasing total annual wages at the Indianapolis facility by about $6 million, from the current $7 million to about $13 million in 2013, represents a beneficial influx of income to Marion County. However, this increase represents only about 0.02 percent of the total income in Marion County (Table 3-1) and only about 0.01 percent of the County's total output. These represent a very small increase to the County's economy. The proposed expansion would also involve significant

purchases of new equipment to increase EnerDel's manufacturing capacity. However, it is expected that much of this equipment would come from outside the region. This would represent a short-term beneficial effect on the national economy, but would be expected to have only minor effects on the economy of Marion County.

Socioeconomic Impacts at the MSA Level

Figure 3-3 shows the estimated changes in workers and annual wages anticipated for all three EnerDel locations combined. The values for 2009 represent the current combined conditions for the Indianapolis and Noblesville locations. As shown in the graphs, EnerDel anticipates a relatively steady increase in workers and wages to the 2013 levels, when there would be about 1,600 people working at the EnerDel facilities with annual wages (without fringe benefits) totaling about $64 million.

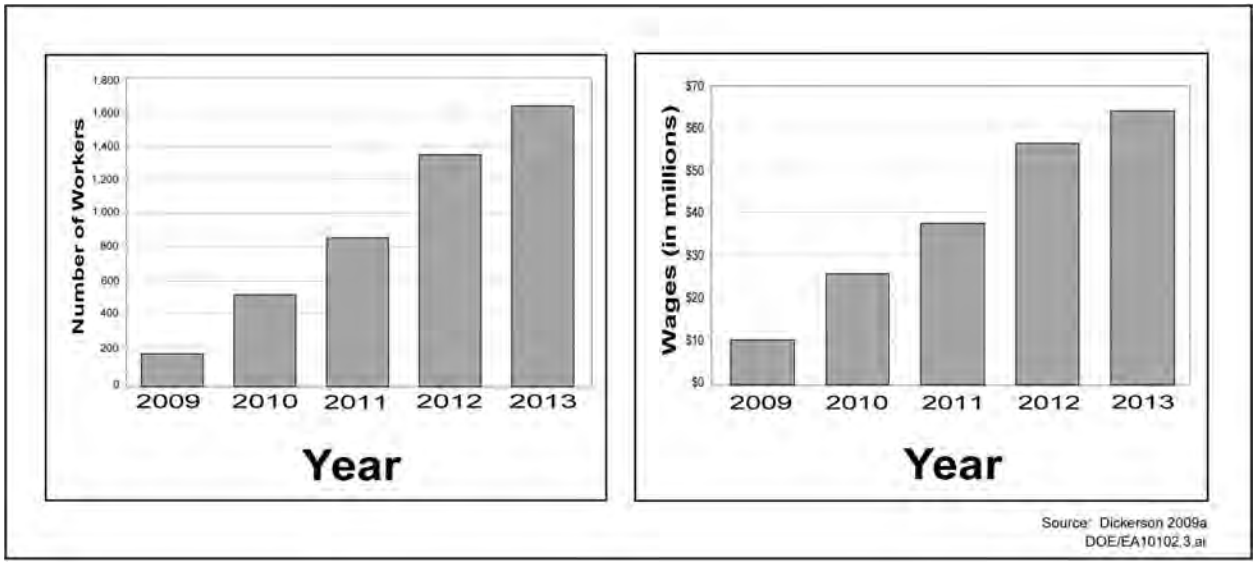

Figure 3-3. Graphs of workers and total wages anticipated for the three EnerDel facilities combined from 2009 (current conditions) through 2013.

The increase of about 1,470 workers in EnerDel's three locations by 2013 represents only about 0.17 percent of the MSA labor force (Table 3-1) and about 2.1 percent of the unemployed workers in the MSA. The added jobs represent beneficial numbers and, although they may be small in comparison with the overall MSA numbers, decreasing unemployment by about 2 percent through a single company's growth is notable. With the number of people that will likely be looking for work, it is expected that most of the added workers would come from within the MSA. As a result, impacts associated with in-migration are expected to be very minor.

Increasing total annual wages at all three EnerDel facilities by about $54 million, from the current $10 million to about $64 million in 2013, represents a beneficial influx of income into the MSA. However, this increase of $54 million represents only about 0.09 percent of the total income in the MSA (Table 3-1) and only about 0.07 percent of the MSA's total output.

However, receipts from the sale of the products (that is, batteries) would be a higher value for comparison with the total output. In any case, these values represent a very small increase to the economy of the MSA. The proposed project would also involve significant purchases of new equipment to increase EnerDel's manufacturing capacity. However, it is expected that much of this equipment would come from outside the region. This would represent a short-term beneficial effect on the national economy, but would be expected to have only minor effects on the MSA economy.

3.1.1.2.2 *No-Action Alternative*

Under the No-Action Alternative, DOE would not provide funding to EnerDel, and the expansion of the EnerDel facility in Indianapolis would not occur. The beneficial economic impacts of increased employment and an increase in the tax base of local and state governments would not occur.

3.1.2 UTILITIES, ENERGY, AND MATERIALS

This section describes the current characteristics of the utilities and energy resources near EnerDel's Indianapolis facility. The utilities addressed are the water, sewer, and municipal solid waste services that are currently used by the Indianapolis facility and that would be used in the future. The energy resources include those of marketed energy resources that are currently used by the Indianapolis facility and that would be used in the future, specifically, electricity and natural gas. As applicable, this section would normally describe the market for materials that would be necessary to increase the battery manufacturing capacity of the Indianapolis facility. However, EnerDel has indicated the materials needed for the new equipment that would go into the facility, and the raw materials that would be needed for increased manufacturing are not considered unique or in any way limited in the market (Dickerson 2009d). Accordingly, this section does not address materials.

3.1.2.1 Affected Environment

3.1.2.1.1 *Utilities*

Water

The Indianapolis facility obtains its water from the City of Indianapolis water system (Indianapolis Water), managed by the Indianapolis Department of Waterworks, and provides drinking water to about 1 million people in multiple counties in central Indiana (Veolia n.d.). Day-to-day management and operation of the water system is performed under contract by Veolia Water Indianapolis. Indianapolis Water obtains most of its water from surface water sources, primarily from the White River and Fall Creek drainages. Morse Reservoir on the White River and Geist Reservoir on Fall Creek assure a dependable water supply to these two river systems and the three water treatment plants they feed. Indianapolis Water also obtains some surface water from Eagle Creek Reservoir, which supplies water to a fourth treatment

plant. Finally, the surface water sources are supplemented on an intermittent basis by a number of groundwater wells (Veolia n.d.).

Indianapolis Water produced 50,300 million gallons of drinking water in 2008 (Veolia 2009). This was 9.1 percent less than that produced in 2007 and was slightly less than the budgeted amount of 53,100 million gallons. The 2008 production equates to an average rate of about 138 million gallons of drinking water per day.

Sewer

The Indianapolis facility is connected to the City of Indianapolis sanitary sewer system, which is managed by the Indianapolis Department of Public Works. Day-to-day management and operation of the City's collection system and two advanced wastewater treatment facilities are performed under contract to United Water. The Indianapolis sanitary sewer system covers about 222 square miles and consists of nearly 3,000 miles of sewer lines ranging from 8 to 120 inches in diameter, almost 110,000 manholes, and more than 250 lift stations (DPW 2009).

The two advanced wastewater treatment plants are the Belmont Plant and the Southport Plant. Both are on the south side of Indianapolis, adjacent to the White River, with the Southport Plant about 5 miles south (downstream) of the Belmont Plant. The Belmont Plant has an average flow capacity of 120 million gallons per day with peak flows up to 300 million gallons per day (DPW 2009). The plant receives flow from the north and east sides of Marion County as well as from the Indianapolis city center area (Indianapolis 2006). The Southport Plant has an average flow capacity of 125 million gallons per day and peak flows of 180 million gallons per day (DPW 2009). The Southport Plant receives flow primarily from the east, west, and south sides of Marion County as well as from the northern portion of Johnson County, which lies to the south of Marion County (Indianapolis 2006).

The Belmont Plant is the older of the two facilities, originally put into service in 1924. Many of the central city areas originally served by this plant had combined sewer systems, designed to carry both storm water and sanitary waste (DPW 2009). Because of the combined sewers and because some of the older portions of the collection system have deteriorated enough to allow storm water infiltration, the sewer system has had to deal with high sewer system flows during storm events. In the past, the sewer system included designed overflows to mitigate these conditions. In addition, the sewer system was designed so that some of the flow to the Belmont Plant could be diverted to the Southport Plant during significant precipitation events. In the 2006 timeframe, the City of Indianapolis developed plans to remedy these conditions and, particularly, to eliminate the designed overflows (Indianapolis 2006). The City also entered into a consent decree with the U.S. Environmental Protection Agency (EPA) and the Indiana Department of Environmental Management to implement the remedial actions. Based on its latest six-month status report (Indianapolis 2009), the City is on schedule for completing work identified to upgrade the sewer system.

Municipal Solid Waste

Indianapolis' primary mechanism for the management of municipal solid waste is the Indianapolis Resource Recovery Facility operated by Covanta Energy. The resource recovery facility consists of three 725 ton-per-day waterwall furnaces that burn municipal solid waste and produce steam that is purchased to power Indianapolis' downtown heating loop (Covanta 2009). The facility is in the southwest portion of the city, inside the I-465 Beltway.

The Indiana Department of Environmental Management has posted many of the routine operational reports submitted by Covanta Energy in its "Virtual File Cabinet" that can be found on the Department's web site. Although it does not appear that every monthly report is available, six monthly reports during 2009 (IDEM 2009) show a monthly average of 58,400 tons of municipal solid waste being burned. Eight monthly reports during 2008 (IDEM 2008a, 2009) show a monthly average of 59,300 tons of municipal solid waste being burned. These values equate to yearly rates of about 700,000 tons for 2009 and 710,000 tons for 2008. On a daily basis, these values equate to about 1,920 tons and 1,950 tons, respectively, which can be compared with the total design capacity of 2,175 tons per day for the three furnaces. It can be concluded from this that the Covanta Energy facility operates at very close to maximum capacity since it is reasonable to assume the equipment has some down time for maintenance and repairs. The Covanta facility burned about 13,600 tons per week based on the available 2008 and 2009 monthly records.

3.1.2.1.2 *Energy*

Electricity

EnerDel's facility in Indianapolis gets its electricity from Indianapolis Power and Light (IPL), which provides power to Marion County and some outlying areas (IEA n.d.). IPL has a service territory of 528 square miles and provides electric service to approximately 470,000 residential, commercial, and industrial users in this area, and maintains a transmission system of over 3,200 miles of lines and a distribution system with almost 29,000 miles of line. IPL owns and operates its own power-generating plants with a total capacity of 3,353 megawatts. This comes from three primarily coal-fired generating plants and a separate combustion turbine (IPL 2008). The IPL production capacity compares with a net summer capability for all of Indiana's electric power industry to produce about 27,000 megawatts (DOE 2009a).

IPL is connected to the regional grid, which provides additional reliability and allows excess energy to be supplied (sold) to other utilities in the region. IPL is a member of the Reliability*First* region under the North American Electric Reliability Corporation (formerly the North American Electric Reliability Council). The Reliability*First* region covers an area that includes all of Indiana, Ohio, Pennsylvania, West Virginia, New Jersey, Delaware, and Maryland; most of Michigan; and parts of Illinois, Wisconsin, Kentucky, and Virginia.

In its report, *Electric Power Annual 2007* (DOE 2009b), DOE compiled information on electric usage by North American Electric Reliability Corporation regions within the United States.

During summer, 2005 through 2007, the Reliability*First* region had net internal electrical demands that averaged 182,000 megawatts and, during the same period, had capacity margins that ranged from 13.5 to 17.1 percent (DOE 2009b). (Capacity margin is the amount of unused available capacity of an electric power system at peak load as a percentage of capacity resources.) In projecting future effects of actual and planned capacity resources, DOE estimates that summer net demands in the Reliability*First* region from 2007 through 2012 will average 185,000 megawatts, and the capacity margin will range from 12.3 to 17.1 percent (DOE 2009b). During the corresponding winters (extending into 2013), DOE estimates that the average net demand will be 146,000 megawatts with the capacity margin ranging from 30.9 to 33.5 percent (DOE 2009b). The significantly lower demand in the winter is consistent with heavy use of electricity for cooling in the summer and heavy use of natural gas in the winter for heating.

Natural Gas

EnerDel's facility in Indianapolis gets its natural gas from Citizens Energy Group, which is a local distribution company transporting natural gas to customers in and around Indianapolis. Citizens Energy Group is operated as a Public Charitable Trust and its natural gas division serves more than 264,000 customers (Citizens Energy 2008). In 2008, Citizens Energy Group delivered about 48,700 thousand decatherms of natural gas to Marion County (Citizens Energy 2008). This equates to 48,700 billion British thermal units, or about 48,700 million cubic feet.

The state of Indiana produces only minimal amounts of natural gas, so demand is met by deliveries through several major pipelines carrying product primarily from the Gulf States and from western Canada (DOE 2009a). Natural gas use in Indiana is increasing and is dominated by the residential sector where it is used as the primary energy for heating in about two-thirds of the households. In 2008, total natural gas consumption in the state was about 536,000 million cubic feet, which was about 2.3 percent of the overall amount used in the United States (DOE 2009a).

3.1.2.2 Environmental Consequences

3.1.2.2.1 *Proposed Project*

This section addresses potential environmental consequences associated with the proposed expansion for each of the utility and energy topics described in Section 3.1.2.1.

Utilities

Water

EnerDel's Indianapolis facility currently does not use significant quantities of process water, and that is expected to remain the same with the proposed expansion. Current water demand primarily is due to the personal needs of the workers. EnerDel estimates that the Indianapolis facility workforce would grow from the current level of about 120 people to about 330 people in 2013 (Figure 3-2), so the proposed expansion would result in increased water demand on the existing water utility.

EnerDel does not have estimates for current water demands, but there are typical values available in references that can be used to generate reasonable estimates. In this case, the Indiana Administrative Code has established values for use in the design of water systems when better, more specific data are not available. The Code identifies a quantity of 20 gallons per day per employee in a factory without showers and a comparable quantity of 35 gallons per day for a factory with showers (327 IAC 8-3.3-2). Although showers are not expected to be a routine need for EnerDel's workforce, DOE used the larger number in this EA for conservatism and to cover any minor demands for process water, such as the water needed for the wet scrubbers that are part of the facility's air pollution control equipment.

Assuming the entire Indianapolis facility workforce was present on the same day, the current demand (with a workforce of 120 people at 35 gallons per day) is estimated at 4,200 gallons per day; in 2013, with 330 workers, this would increase to about 11,600 gallons per day. The latter quantity represents about 0.008 percent of the 138 million gallons per day Indianapolis Water produces and distributes. The increased water demand would have no impact on the existing water system. Further, in order to accommodate a workforce of 330 people, the Indianapolis facility would operate with three full shifts of workers. Therefore, the water demand during each shift in the future would be similar to that of the current single-shift operation, so there would be no issues relative to the capacity of distribution lines.

Sewer

Since EnerDel's Indianapolis facility currently does not use significant quantities of process water, it also does not produce a significant quantity of process wastewater. This is expected to remain the same with the proposed expansion. Current sewage loading is due primarily to the personal needs of the workers. EnerDel estimates the facility workforce would grow from the current level of about 120 people to about 330 people in 2013 (Figure 3-2).

Similar to that described for water, the Indiana Administrative Code has established values for use in the design of sewer systems when better, more specific data are not available. The Code identifies the same applicable values for wastewater as those described for water; that is, a quantity of 20 gallons per day per employee in a factory without showers and a comparable quantity of 35 gallons per day for a factory with showers (327 IAC 3-6-11). Although showers are not expected to be a routine need for EnerDel's workforce, DOE used the larger number for conservatism and to cover any minor production of process wastewater.

Assuming the entire Indianapolis facility workforce was present on the same day, the current sewage loading (with a workforce of 120 people at 35 gallons per day) is estimated at 4,200 gallons per day; in 2013, with 330 workers, this would increase to about 11,600 gallons per day. Based on maps of the sewer system, flow from the Indianapolis facility runs to the Belmont Wastewater Treatment Plant. The sewage production rate of 11,600 gallons per day represents about 0.01 percent of the 120 million gallons per day treated by the Belmont Plant. The increased sewage loading would have no impact on the existing water system. Further, with the

three full shifts of workers, much of the sewage would be produced during off hours, so there would be little effect on the existing collection system.

Municipal Solid Waste

EnerDel estimates its Indianapolis facility would produce about 24 cubic yards of municipal solid waste per week once the proposed expansion was complete (Dickerson 2009e). This waste would be sent to the Covanta Energy facility for incineration and energy recovery. A reasonable estimate for the density of uncompacted waste from a commercial/industrial facility is 300 to 500 pounds per cubic yard (EPA 1993), so the weight of the solid waste produced on a weekly basis would be up to 6 tons. This represents about 0.04 percent of the approximately 13,600 tons per week that is incinerated currently at the Covanta facility. The increased loading of municipal solid waste would have no impact on the existing energy recovery system.

Section 3.1.3 addresses other types of waste that would be generated at the Indianapolis facility.

Energy

Electricity

EnerDel estimates its Indianapolis facility would require 1,380 megawatt hours of electricity per year once the proposed expansion was complete (Dickerson 2009f). Assuming the facility operated for three full shifts, five days per week, 50 weeks per year, there would be 6,000 hours of operation per year, and the average electric load for the facility would be 0.23 megawatts. This represents less than 0.01 percent of the 3,353-megawatt generating capacity of IPL and a much smaller percentage of the 27,000 megawatt generating capacity in all of Indiana. The increased electrical load would have no impact on the existing electrical utility service.

Natural Gas

EnerDel estimates its Indianapolis facility would require about 157,000 million British thermal units of natural gas per year once the proposed expansion was complete (Dickerson 2009f). This represents about 0.32 percent of the 48,700 billion British thermal units of natural gas delivered by Citizens Energy Group in the Indianapolis area in 2008. The Indianapolis facility's natural gas demand is also about 0.03 percent of the approximately 536,000 billion British thermal units (or 536,000 million cubic feet) of natural gas used in the entire state of Indiana during 2008. The increased natural gas demand would have no notable impact on the existing natural gas utility service.

3.1.2.2.2 *No-Action Alternative*

Under the No-Action Alternative, DOE would not provide funding to EnerDel, and the expansion of the EnerDel facility in Indianapolis would not occur. The potential environmental impacts to utility and energy resources associated with the expansion of the EnerDel facility in Indianapolis would not occur.

3.1.3 WASTE

Section 3.1.2 describes the management of the municipal solid waste currently generated at EnerDel's Indianapolis facility and that which the proposed expansion would generate. This section addresses hazardous waste, industrial waste (specifically, waste solvent), and materials that are recycled.

3.1.3.1 Affected Environment

Hazardous waste, as defined under the *Resource Conservation and Recovery Act* (RCRA), is waste that is tightly regulated from its point of generation to its point of ultimate treatment or other disposition. EnerDel's Indianapolis facility is currently identified with the State and EPA as a small-quantity generator of hazardous waste, which means the amount of hazardous waste produced is greater than 100 kilograms (220 pounds) per month, but less than 1,000 kilograms (2,200 pounds) per month. The facility produces relatively small quantities of two types of hazardous waste: one suitable for fuel blending and the other suitable for incineration. Both types of waste are sent offsite to RCRA-regulated facilities for the appropriate treatment. In the state of Indiana during 2007, 28,000 tons of hazardous waste were managed through fuel blending and over 34,000 tons of hazardous waste were incinerated (EPA 2008a).

The Indianapolis facility also produces waste n-methylpyrrolidone (NMP) solvent, which is sent offsite as nonhazardous, industrial waste but also managed through fuel blending.

Finally, several types of nonhazardous waste materials produced in the Indianapolis facility are sent offsite for recycling. These materials, which include cardboard, plastic, aluminum, and steel, are recycled heavily throughout the United States. In 2007, over 45 million tons of paper and cardboard were recovered in the United States, along with about 7 million tons of metals and 2 million tons of plastics (EPA 2008b).

3.1.3.2 Environmental Consequences

3.1.3.2.1 *Proposed Project*

With the proposed expansion, the amount of hazardous waste produced at the Indianapolis facility would increase from less than 220 to about 2,000 pounds per month, or 12 tons per year, once the expanded activities were fully underway (Dickerson 2009e). The types of hazardous waste produced would be expected to be the same as those currently produced at the facility. EnerDel would produce approximately 1.2 tons of hazardous waste appropriate for fuel blending and about 10.8 tons of hazardous waste appropriate for incineration annually (Dickerson 2009g). These values represent very small percentages of the 28,000 tons and 34,000 tons of hazardous waste that are managed annually through fuel blending and incineration, respectively, at the state level. In addition, these wastes could be sent to permitted hazardous waste facilities located outside of Indiana, so the amount generated by EnerDel could be considered even smaller percentages of larger, multi-state treatment markets. There should be no problem or increased

impacts associated with the proper management of the increased quantity of hazardous waste at the Indianapolis facility. Production and management of the wastes would still be tightly regulated, and capacity of existing treatment facilities would not be affected by the very minor increases in waste quantity.

EnerDel anticipates the expanded operations at the Indianapolis facility, and the associated increases in hazardous waste production, would require application for large-quantity generator status. In general, being a large-quantity generator would impose another layer of hazardous waste management and reporting requirements on the facility, and further reduce the potential for any adverse impacts.

EnerDel estimates the expanded operations at the Indianapolis facility would produce about 9,000 pounds of NMP waste per month, or 54 tons per year. As noted previously, this waste is not a RCRA hazardous waste; it is an industrial waste that is also managed by sending offsite for fuel blending. This quantity represents about 0.19 percent of the amount of waste managed by fuel blending on an annual basis in all of Indiana. The management approach allows value (that is, its energy content) to be recovered from the waste product and is a well-regulated and acceptable means of managing qualifying waste material. This small, added quantity should have no notable impact on existing waste blending facilities.

One of EnerDel's objectives is zero waste going into a landfill (Dickerson 2009e), and this would continue with the proposed expansion. The municipal solid waste discussed in Section 3.1.2 would continue to go to a municipal incinerator for energy recovery, and before being collected for that purpose, EnerDel would continue to segregate specific solid waste types for recycling. EnerDel estimates that under the full, expanded operations at the Indianapolis site, there would be about 13 cubic yards of cardboard and 2.4 cubic yards of plastic, aluminum, and steel produced on a weekly basis that would be sent offsite for recycling (Dickerson 2009e). At an estimated 150 pounds per cubic yard for both types of uncompacted, loose waste (EPA 1993) and assuming 50 operational weeks per year, these waste-for-recycling quantities equate to about 49 tons of cardboard and 9 tons of plastic, aluminum, and steel annually. These are insignificant numbers in comparison with the millions of tons of these materials recycled annually in the entire United States (Section 3.1.3.1). As long as there is a market for these materials or their value is sufficient that recyclers are willing to take them, no adverse impacts are expected from the proposed waste management actions.

There would also be waste battery cells and aluminum and copper scrap from electrode coating that periodically would be sent offsite for recycling. There are no estimates available for this type of non-routine scrap, but EnerDel has established markets for these materials and relative environmental impacts would be expected to be positive as a result of this recycling.

3.1.3.2.2 *No-Action Alternative*

Under the No-Action Alternative, DOE would not provide funding to EnerDel, and the expansion of the EnerDel facility in Indianapolis would not occur. The potential environmental

impacts to waste management resources associated with the expansion of the EnerDel facility in Indianapolis would not occur.

3.1.4 TRANSPORTATION

3.1.4.1 Affected Environment

EnerDel's Indianapolis facility is located in the northeast section of the city, outside the I-465 Beltway and adjacent to the east side of I-69 (Figure 2-2). Specifically, the facility is on Hague Road between East 86th and East 88th streets (Figure 2-3). Although the facility is adjacent to I-69, the nearest access/exit ramps for the freeway are at East 82nd Street to the south and East 96th Street to the north. East 82nd Street and East 96th Street represent the primary east-to-westbound roads in the area. East 82nd Street is a four-lane road with a center turning lane to the west of Hague Road and narrows to a two-lane road to the east of Hague Road. East 82nd Street is a principle arterial on the west side of I-69 and a minor arterial to the east (INDOT n.d.). East 96th Street has four to six lanes in addition to center turning lanes and, in some cases, outside turning lanes. East 96th Street is a collector on the west side of I-69 and a minor arterial to the east (INDOT n.d.). Hague Road is a four-lane road with turning lanes at East 96th Street, but to the south (and near the EnerDel facility) it is a two-lane road with turning lanes. Hague Road reverts back to a four-lane road near East 82nd Street and to the south. Hague Road is a collector throughout this area (INDOT n.d.).

The Indianapolis Metropolitan Planning Organization provided DOE output from its transportation model in the form of a map showing volume-to-capacity information for the roads in the Indianapolis area based on 2002 traffic data (Kostyn 2009). Roads are shown in color and thickness coded lines depending on the volume-to-capacity ratio, with the highest three categories being (1) 0.9 to 1, (2) 1 to 1.5, (3) and 1.5 to 3.2. That is, the highest designation would show roads operating with traffic loads well over their capacity (from 50 percent to more than 200 percent). Hague Road in the area of EnerDel's facility and the intersection of Hague Road and East 82nd Street are shown as being heavily congested, in the 1.5 to 3.2 volume-to-capacity range. East 96th Street is also in that range at the interchange with I-69. Both East 82nd Street and East 96th Street beyond the intersections and interchanges with I-69 drop down to the next-lower category (that is, a volume-to-capacity ratio of 1 to 1.5). I-69 through this area is also in the 1 to 1.5 range. Based on this information, it is clear these roads already operate under congested traffic conditions, carrying more traffic than their intended capacity. Furthermore, this appears to be the condition for most of the primary roadways in Indianapolis and extends to areas outside of the city.

3.1.4.2 Environmental Consequences

3.1.4.2.1 *Proposed Project*

With the proposed expansion, EnerDel estimates the Indianapolis facility workforce would grow from the current level of about 120 people to about 330 people in 2013 (Figure 3-2). A

corresponding increase in the traffic to and from the facility would be expected. However, in order for the existing facility to accommodate the additional workers, operations would change from one to three full shifts. Assuming the day shift workforce remained about the same as at present and that the other two shifts had an equal number of workers, the off-shifts would each be about 100 workers. Although traffic in Indianapolis can be congested, particularly during rush hour periods, the proposed expansion would not be expected to result in significant changes during these periods. There could be more traffic coming and going from the EnerDel facility at rush hour periods than at present, but one group would be leaving, while the other would be coming, and one of the two groups would mainly be moving in the opposite direction from the majority of rush hour traffic. Assuming the day shift workforce increased from its present number of workers, there would be increased traffic during rush hour periods, but the increases would be minor in comparison with the volume of traffic already moving through the area.

Increased operations at the Indianapolis facility would also result in additional truck or freight movement to and from the facility. However, these trips would normally be scheduled outside of the normal rush hour periods, and with the facility operational for three shifts, some of these vehicle movements could be scheduled for the off-shifts.

DOE expects that additional traffic at the Indianapolis facility as a result of the proposed expansion would not significantly worsen congestion or other traffic issues in the area.

3.1.4.2.2 *No-Action Alternative*

Under the No-Action Alternative, DOE would not provide funding to EnerDel, and the expansion of the EnerDel facility in Indianapolis would not occur. The potential environmental impacts from increased traffic associated with the expansion of the EnerDel facility in Indianapolis would not occur.

3.1.5 AIR QUALITY

3.1.5.1 Affected Environment

The Indianapolis facility is in an area currently in attainment with all criteria air pollutants for which National Ambient Air Quality Standards have been established, with the exception of particulate matter with an aerodynamic diameter of 2.5 micrometers or less ($PM_{2.5}$; EPA 2009a). The 2008 pollutant concentrations for Marion and Hancock counties were below the Standards, with the exception of ozone and $PM_{2.5}$ (Table 3-2). Average 8-hour concentrations of ozone were at the 2008 standard of 0.075 parts per million during 2008. However, the 1997 ozone standard, 0.080 parts per million, remains in place for implementation purposes as the EPA undertakes rulemaking to address the transition from the 1997 ozone standard to the 2008 ozone standard. The 2008 $PM_{2.5}$ annual arithmetic mean, 15.07 micrograms per cubic meter, is just above the standard of 15 micrograms per cubic meter.

Table 3-2. Ambient air quality monitoring data for criteria pollutants reported for 2008 for Marion and Hancock, Indiana counties.[a]

Pollutant	Averaging period	NAAQS[b]	Ambient air quality values (2008)	
			Marion	Hancock
Carbon monoxide (ppm)	1-hour	35	3.5	(d)
	8-hour	9	2.1	(d)
Lead ($\mu g/m^3$)	Quarterly	1.5	0.04	(d)
Nitrogen dioxide (ppm)	Annual	0.053	0.011	(d)
PM_{10} ($\mu g/m^3$)	24-hour	150	55	(d)
$PM_{2.5}$ ($\mu g/m^3$)	Annual	15	15.07	(d)
	24-hour	35	33.7	(d)
Ozone (ppm) (2008)	8 hour	0.075[c]	0.075	0.074
Ozone (ppm) (1997)	8 hour	0.080[c]		
Sulfur dioxides(ppm)	Annual	0.03	0.003	(d)
	24-hour	0.14	0.016	(d)

a. Source: EPA County Air Quality Report – Criteria Air Pollutants (EPA 2009b).
b. National Ambient Air quality Standards in effect in 2008 (EPA 2009c), see note c regarding ozone.
c. The 1997 standard and implementation rules for that standard will remain in place for implementation purposes as EPA undertakes rulemaking to address the transition from the 1997 ozone standard to the 2008 ozone standard, EPA, National Ambient Air Quality Standards.
d. No value reported by EPA for Hancock County.
EPA = U.S. Environmental Protection Agency.
NAAQS = National Ambient Air Quality Standards.
ppm = parts per million.
$\mu g/m^3$ = micrograms per cubic meter.

3.1.5.2 Environmental Consequences

Environmental consequences are addressed in terms of EnerDel's proposed project and the No-Action Alternative. DOE also performed an evaluation of greenhouse gases. Since the evaluation addresses the entire proposed project (that is, all three facilities) and a majority of the activities would occur at the facility near Greenfield, the evaluation is presented one time as part of the Greenfield discussion (Section 3.3.5.3)

3.1.5.2.1 *Proposed Project*

As Chapter 2, Section 2.2.1 describes, the Indianapolis facility would be expanded by installation of a second electrode coating line within the footprint of the existing facility. One line is currently operating under a New Source Construction and Federally Enforceable State Operating Permit, F097-26640-99589 (DPW-OES 2008), which was issued September 4, 2008 (with an expiration date of September 4, 2013) by the Indianapolis Department of Public Works, Office of Environmental Services on behalf of the Indiana Department of Environmental Management. The permit was issued to cover both manufacturing lines. The permit establishes operating controls and limits that EnerDel would implement to maintain the Potential to Emit below the values shown in Table 3-3. With controls in place, facility emissions with both lines operating

would be below the major source thresholds set under the *Clean Air Act* Title V, Prevention of Significant Deterioration, and Nonattainment New Source Review permit requirements. In addition, as shown in Table 3-3, with the Indianapolis facility in full production, the EnerDel air emissions would be a small portion of the total Marion County air emissions.

3.1.5.2.2 *No-Action Alternative*

Under the No-Action Alternative, DOE would not provide funding to EnerDel, and the expansion of the EnerDel facility in Indianapolis would not occur. The potential environmental impacts to air quality and greenhouse gases (Section 3.3.5.3) associated with the expansion of the EnerDel facility in Indianapolis would not occur.

Table 3-3. Indianapolis facility Potential to Emit with the emission limits of the FESOP FO97-26640-99589 implemented.

	Potential to Emit with emission controls	Major source thresholds for comparison		Total county air emissions in 2002 for comparison	
Pollutant	(tons/year)	Title V (tons/year)	PSD & Non-attainment NSR (tons/year)	Marion County (tons/year)[a]	Hancock County (tons/year)[a]
Particulate matter	9.98[b]	NA	250	Not reported	Not reported
PM_{10}[c]	10.21	100	250	22,889	8,210
$PM_{2.5}$[c]	10.21	-	100	7,480	1,192
SO_2	0.02	100	250	59,365	475
NO_X	4.03	100	250	44,017	3,696
VOC	71.98	100	250	41,570	3,626
CO	3.38	100	250	275,471	24,490
Total HAPs	<25	25	NA	9,980	Not reported
Worst single HAP	<10	10	NA	NA	NA

a. Source EPA 2009d for all but total HAPs, which is from EPA 2009e.

b. Particulate matter is shown in this case as being slightly less than the PM_{10} and $PM_{2.5}$ values because emissions estimates for the boilers (a small portion of the total emissions) included PM_{10} values calculated with filterable and condensable PM_{10} combined, while corresponding particulate matter values were calculated with only filterable matter considered.

c. PM_{10} is particulate matter with an aerodynamic diameter less than or equal to 10 micrometers and, by definition, includes all of the $PM_{2.5}$, which is particulate matter with an aerodynamic diameter less than or equal to 2.5 micrometers.

CO = carbon monoxide.
HAP = hazardous air pollutant.
NOx = nitrogen oxides.
NSR = new source review.
PM = particulate matter.
PSD = prevention of significant deterioration.
SO_2 = sulfur dioxide.
VOC = volatile organic compound.

3.2 Noblesville

The environmental resource areas being described and evaluated for the Noblesville location are (1) socioeconomics; (2) utilities, energy, and materials; (3) waste; and (4) transportation. These are the resource areas that are common for all three locations.

3.2.1 SOCIOECONOMICS

3.2.1.1 Affected Environment

Noblesville and the rest of Hamilton County are within the Indianapolis-Carmel MSA. Section 3.1.1.1 describes the socioeconomic characteristics of the MSA. Table 3-1 shows key socioeconomic indicators for Hamilton County. The Hamilton County values for population, output, income, and labor force are all in the range of 13 to 18 percent of the comparable values for the entire MSA. In comparing all ten Indiana counties that make up the MSA, Hamilton County is second only to Marion County in the amount it contributes to the MSA totals.

3.2.1.2 Environmental Consequences

Environmental consequences are addressed in terms of EnerDel's proposed project and the No-Action Alternative.

3.2.1.2.1 *Proposed Project*

This section addresses potential socioeconomic impacts associated with the proposed expansion at the Noblesville, Hamilton County, location. Section 3.1.1.2.1 addresses the socioeconomic impacts at the MSA level of all three EnerDel facilities combined.

Figure 3-4 shows the estimated changes in workers and annual wages EnerDel anticipates for the Noblesville location. The values for 2009 represent the current conditions at that location. In 2010, EnerDel expects the workforce at the Noblesville facility would remain at levels similar to the present, but possibly with some of the managers moving to the new facility near Greenfield and new employees at the facility being in comparatively lower wage levels. (Hence, the slight increase in the number of workers and slight decrease in the wages.) The graphs show that after 2010, EnerDel anticipates a relatively steady increase to the 2013 levels, when there would about 160 people working at the Noblesville facility with annual wages (without fringe benefits) totaling about $6.6 million.

The increase of about 120 workers in the Noblesville location by 2013 represents only about 0.09 percent of the Hamilton County workforce (Table 3-1) and about 1.1 percent of the unemployed workers in Hamilton County. Although the added jobs represent beneficial numbers, they are small in comparison with the overall County numbers. With the number of people that will likely be looking for work, it is expected that most of the added workers would come from within the County or in nearby areas. As a result, impacts associated with in-migration are expected to be minor.

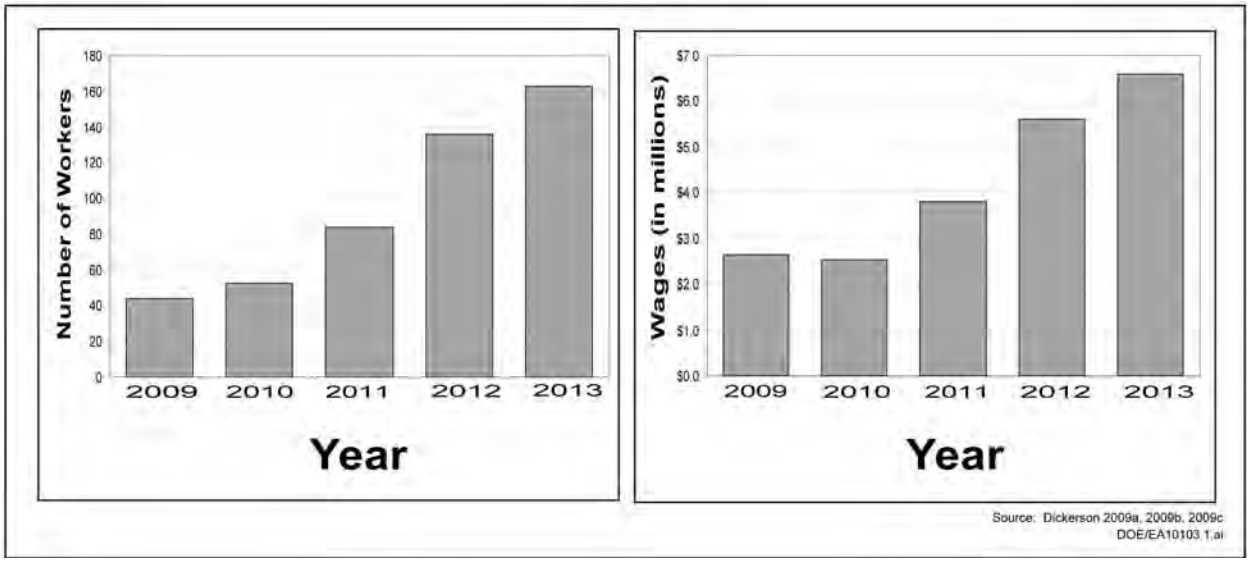

Figure 3-4. Graphs of workers and total wages anticipated for the Noblesville facility from 2009 (current conditions) through 2013.

Increasing total annual wages at the Noblesville facility by about $3.9 million, from the current $2.7 million to about $6.6 million in 2013, also represents a beneficial influx of income to Hamilton County. However, this increase of $3.9 million represents only about 0.03 percent of the total income in Hamilton County (Table 3-1) and only about 0.04 percent of the County's total output. These represent a very small increase to the County's economy. The proposed expansion would also involve significant purchases of new equipment to increase EnerDel's manufacturing capacity. However, it is expected that much of this equipment would come from outside the region. This would represent a short-term beneficial effect on the national economy, but would be expected to have only minor effects on the economy of Hamilton County.

3.2.1.2.2 *No-Action Alternative*

Under the No-Action Alternative, DOE would not provide funding to EnerDel, and the expansion of the EnerDel facility in Noblesville would not occur. The beneficial economic impacts of increased employment and an increase in the tax base of local and state governments would not occur.

3.2.2 UTILITIES, ENERGY, AND MATERIALS

This section describes the current characteristics of the utilities and energy resources at the Noblesville facility. As in Section 3.1.2, the utilities addressed are the water, sewer, and municipal solid waste services, and the energy resources described are electricity and natural gas. Similar to Section 3.1.2, there are no unique or limited materials that would be in involved in the actions at Noblesville, so this section does not address materials.

3.2.2.1 Affected Environment

3.2.2.1.1 *Utilities*

Water

The Noblesville facility obtains its water from the distribution system owned and operated by Indiana American Water (Dickerson 2009a), a subsidiary of American Water, the self-proclaimed largest investor-owned water and wastewater utility company in the United States. The water system in Noblesville is fed entirely from groundwater that is first treated in one of two system treatment plants. Both plants are based on filtration systems and use chlorine and fluoride as additives. With both treatment plants, the drinking water production capacity is a firm 7 million gallons per day, with a maximum capacity of 8.5 million gallons per day (Carter 2009a).

In 2008, the average water production of the Indiana American Water Noblesville system was 3.7 million gallons per day. During that same year, the five peak water use days (all in August and September) averaged 6.1 million gallons per day (Carter 2009b).

Sewer

The Noblesville facility is connected to the City's sanitary sewer system, which is managed by the Noblesville Wastewater Department. The sewer system includes an activated sludge-type wastewater treatment plant with a normal capacity of 5 million gallons per day (IDEM 2006). The treatment is also described as having a peak design capacity equivalent to 10 million gallons per day, which is assumed to be the plant's capacity for short-term peak flows.

Municipal Solid Waste

Municipal solid waste from the Noblesville facility goes to the Indianapolis Resource Recovery Facility operated by Covanta Energy. This is the same facility described in Section 3.1.2.1.1 for EnerDel's Indianapolis facility.

3.2.2.1.2 *Energy*

Electricity

EnerDel's facility in Noblesville purchases its electricity from Duke Energy, which provides power to most of central and southern Indiana (with the notable exception of Marion County, which is served by IPL). Duke Energy also provides power to portions of North Carolina, South Carolina, Ohio, and Kentucky (Duke Energy 2009). Duke Energy has a service territory of about 50,000 square miles and provides electric service to approximately 4 million customers, including about 780,000 in Indiana. It has about 21,000 miles of transmission lines and about 151,000 miles of distribution lines. Duke Energy's total power generation capacity is more than 27,000 megawatts and it operates about a dozen generating plants in Indiana that include fossil-fueled plants, combustion turbines, and one hydroelectric facility (Duke Energy 2009). The Duke Energy production capacity, at more than 27,000 megawatts distributed across multiple

states, is basically the same as the net summer capability for all of Indiana's electric power industry to produce about 27,000 megawatts (DOE 2009a).

Duke Energy is connected to the regional grid, which provides additional reliability and allows excess energy to be supplied (sold) to other utilities in the region. Duke Energy, like IPL, is a member of the Reliability*First* region under the North American Electric Reliability Corporation. Section 3.1.2.1.2 describes the characteristics of the Reliability*First* region in terms of its geography, electrical demands, and capacity.

Natural Gas

EnerDel's facility in Noblesville purchases its natural gas from Vectren, which is a holding company that includes three operating utilities distributing natural gas to nearly two-thirds of Indiana and to west-central Ohio. The Vectren utility providing natural gas to central and southern Indiana is the Indiana Gas Company, or Vectren North. Through the three combined gas utilities, Vectren supplies natural gas service to about 996,000 customers (Vectren 2009a), which includes over 560,000 customers in the Vectren North area (Vectren 2009b) where the Noblesville facility is located. In 2008, the three Vectren natural gas utilities delivered about 206,000 thousand decatherms of natural gas to their customers (Vectren 2009a). This equates to about 206,000 billion British thermal units or approximately 206,000 million cubic feet.

Section 3.1.2.1.2 describes the characteristics of natural gas supply at the Indiana state level.

3.2.2.2 Environmental Consequences

3.2.2.2.1 *Proposed Project*

Utilities

Water

EnerDel's Noblesville facility does not currently use significant quantities of process water, and this is expected to remain the same with the proposed expansion. Current water demand is due primarily to the personal needs of the workers. EnerDel estimates the Noblesville facility workforce would grow from the current level of about 40 people to about 160 people in 2013 (Figure 3-4), so the proposed expansion would result in increased water demand on the existing water utility.

EnerDel does not have estimates for current water demands, but as Section 3.1.2.2.1 describes, the Indiana Administrative Code has established values for use in the design of water systems when better, more specific data are not available. For conservatism, DOE used the estimated water demand for a factory with showers, which is 35 gallons per day per employee (327 IAC 8-3.3-2), even though showers would not be a routine need for EnerDel's workforce.

Assuming the entire Noblesville facility workforce was present on the same day, the current demand (with a workforce of 40 people at 35 gallons per day) would be 1,400 gallons per day; in 2013, with 160 workers, this would increase to about 5,600 gallons per day. The latter quantity

represents about 0.15 percent of Indiana American Water's daily production average of 3.7 million gallons and only 0.08 percent of the distribution system's daily treatment capacity of 7 million gallons (both during 2008). The increased water demand would have no adverse impact on the existing water system. Further, in order to accommodate a workforce of 160 people, the Noblesville facility would operate with three full shifts of workers. Therefore, the water demand during each shift in the future would be similar to that of the current single-shift operation, so there would be no issues relative to the capacity of distribution lines.

Sewer

Since the Noblesville facility would not use significant quantities of process water, it would also not produce a significant quantity of process wastewater. As a result, sewage loading primarily would be due to the personal needs of the workers. EnerDel estimates the facility workforce would grow from the current level of about 40 people to about 160 people in 2013 (Figure 3-4). As Section 3.1.2.2.1 describes, the Indiana Administrative Code identifies a quantity of 20 gallons per day per employee in a factory without showers and a comparable quantity of 35 gallons per day for a factory with showers (327 IAC 3-6-11). Although showers are not expected to be a routine need for EnerDel's workforce, DOE used the larger number for conservatism and to cover any minor production of process wastewater.

Assuming the entire Noblesville facility workforce was present on the same day, the sewage loading (with a workforce of 160 people at 35 gallons per day) is estimated at 5,600 gallons per day in 2013. This represents about 0.11 percent of the Noblesville wastewater treatment plant daily design capacity of 5 million gallons. The increased sewage loading would have no notable impact on the existing sewer system. Further, with the three full shifts of workers, sewage production would be distributed throughout the day, minimizing the relative effects on the collection system.

Municipal Solid Waste

EnerDel estimates the Noblesville facility would produce about 12 cubic yards of municipal solid waste per week once the proposed expansion was complete (Dickerson 2009e). This waste is estimated to be three to four times the amount currently generated and would be sent to the Covanta Energy facility for incineration and energy recovery. Using the same estimate in Section 3.1.2.2.1 of up to 500 pounds per cubic yard, the weight of the solid waste produced on a weekly basis would be up to 3 tons. This represents about 0.02 percent of the approximately 13,600 tons per week that is incinerated currently at the Covanta facility. The increased loading of municipal solid waste would have no impact on the existing energy recovery system.

Section 3.2.3 addresses other types of waste that would be generated at the Noblesville facility.

Energy

Electricity

EnerDel estimates the Noblesville facility would require 443 megawatt hours of electricity per year once the proposed expansion was complete (Dickerson 2009f). Assuming the facility operated for three full shifts, five days per week, 50 weeks per year, there would be 6,000 hours

of operation per year, and the average electric load for the facility would be 0.074 megawatts. This represents less than 0.0003 percent of the 27,000-megawatt, multi-state generating capacity of Duke Energy. The increased electric load would have no impact on the existing electric utility service.

Natural Gas

EnerDel estimates the Noblesville facility would require about 1,000 million British thermal units of natural gas per year once the proposed expansion was complete (Dickerson 2009f). This represents about 0.0005 percent of the 206,000 billion British thermal units of natural gas Vectren delivered to its Indiana and Ohio customers in 2008. The Noblesville facility's natural gas demand is also about 0.0002 percent of the approximately 536,000 billion British thermal units (or 536,000 million cubic feet) of natural gas used in the entire state of Indiana during 2008. The increased natural gas demand would have no impact on the existing natural gas utility service.

3.2.2.2.2 *No-Action Alternative*

Under the No-Action Alternative, DOE would not provide funding to EnerDel, and the expansion of the EnerDel facility in Noblesville would not occur. The potential environmental impacts to utility and energy resources associated with the expansion of the EnerDel facility in Noblesville would not occur.

3.2.3 WASTE

Section 3.2.2 describes the management of the municipal solid waste currently generated at EnerDel's Noblesville facility and that which the proposed expansion would generate. This section addresses hazardous waste, industrial waste (specifically waste solvent), and materials that are recycled.

3.2.3.1 Affected Environment

The Noblesville facility currently does not generate hazardous waste as defined under RCRA and does not expect to generate RCRA waste with the proposed expansion. Likewise, n-methylpyrrolidone (NMP) solvent waste is not generated at this facility and would not be generated in the future.

The only waste other than the municipal solid waste described in Section 3.2.2.2.1 that routinely would be produced at the Noblesville facility are those sent offsite for recycling. These materials include cardboard, plastic, aluminum, and steel and are materials that are routinely recycled throughout the United States. In 2007, over 45 million tons of paper and cardboard were recovered in the United States, along with about 7 million tons of metals and 2 million tons of plastics (EPA 2008b).

3.2.3.2 Environmental Consequences

3.2.3.2.1 *Proposed Project*

As was described for the Indianapolis facility, one of EnerDel's objectives is zero waste going into a landfill (Dickerson 2009e) and this would continue with the proposed expansion. The municipal solid waste discussed in Section 3.2.2 would continue to go to a local municipal incinerator for energy recovery, and before being collected for that purpose, EnerDel would continue to segregate specific solid waste for recycling. EnerDel estimates that under full, expanded operations at the Noblesville site, there would be about 6.4 cubic yards of cardboard and 1.2 cubic yards of plastic, aluminum, and steel produced on a weekly basis that would be sent offsite for recycling (Dickerson 2009e). At an estimated 150 pounds per cubic yard for both types of uncompacted, loose waste (EPA 1993) and assuming 50 operational weeks per year, the quantities of waste for recycling would equate to about 24 tons of cardboard and 4.5 tons of plastic, aluminum, and steel annually. These are insignificant numbers in comparison with the millions of tons of these materials recycled annually in the United States (Section 3.1.3.1). As long as there is a market for these materials or their value is sufficient that recyclers are willing to take them, no adverse impacts are expected from the proposed waste management actions.

3.2.3.2.2 *No-Action Alternative*

Under the No-Action Alternative, DOE would not provide funding to EnerDel, and the expansion of the EnerDel facility in Noblesville would not occur. The potential environmental impacts to waste management resources associated with the expansion of the EnerDel facility in Noblesville would not occur.

3.2.4 TRANSPORTATION

3.2.4.1 Affected Environment

The Noblesville facility is located in the southern section of the city, in an industrial area that starts at the northwest corner of the intersection of East 146th Street and Huntington Avenue (also designated State Highway 37) (Figure 2-4). Primary access to the industrial area is from East 146th Street, which is a four-lane road with turn lanes. Huntington Avenue is a four-lane, divided expressway that runs to and from I-69 to the south. In the area where East 146th Street and Huntington Avenue intersect, both roads are principle arterials (INDOT n.d.).

The traffic model output provided by Indianapolis Metropolitan Planning Organization (Section 3.1.4.1) covers the area of EnerDel's Noblesville facility. Huntington Avenue is shown with a volume-to-capacity ratio in the range of 1 to 1.5, indicating congested conditions. East 146th Street immediately west of Huntington Avenue is in the 0.7 to 0.9 range, indicating good traffic flow, but continuing west, it soon changes to the 1 to 1.5 range. East 146th Street is shown with a volume-to-capacity ratio of 0 to 0.5 on the east side of Huntington Avenue. The access roads inside the industrial area where the EnerDel facility is located are not shown on the figure.

3.2.4.2 Environmental Consequences

3.2.4.2.1 *Proposed Project*

With the proposed expansion, EnerDel estimates that the Noblesville facility workforce would grow from the current level of about 40 people to about 160 people in 2013 (Figure 3-4). A corresponding increase in the traffic to and from the facility would be expected. However, in order for the existing facility to accommodate that number of additional workers, operations would change from a single shift to three full shifts. Assuming the day shift workforce remained about the same as at present and that the other two shifts had an equal number of workers, the off-shifts would each be about 60 workers. Although traffic in the metropolitan area between Indianapolis and Noblesville can be congested, particularly during rush hour periods, the proposed expansion would not result in significant changes during these periods. There could be more traffic coming and going from the EnerDel facility at rush hour periods than at present, but one group would be leaving while the other would be coming, and one of the two groups would mainly be moving the opposite direction from the majority of rush hour traffic. If it is assumed that the day shift increased from its present number of workers, there would be increased traffic during rush hour periods. The increases, likely in the range of 10 to 20 cars per day (to and from), would be minor in comparison with the volume of traffic already moving through the area.

Increased operations at the Noblesville facility would result in additional truck or freight movement to and from the facility. However, these trips normally would be scheduled outside of the normal rush hour periods and with the facility operational for three shifts, some of these vehicle movements could be scheduled for the off-shifts.

DOE expects that additional traffic at the Noblesville facility as a result of the proposed expansion would not worsen congestion or other traffic issues in the area.

3.2.4.2.2 *No-Action Alternative*

Under the No-Action Alternative, DOE would not provide funding to EnerDel, and the expansion of the EnerDel facility in Noblesville would not occur. The potential environmental impacts from increased traffic associated with the expansion of the EnerDel facility in Noblesville would not occur.

3.3 Greenfield

The environmental resource areas being described and evaluated for the Greenfield location are (1) socioeconomics; (2) utilities, energy, and materials; (3) waste; (4) transportation; (5) air quality; (6) water resource (surface water); and (7) aesthetics and visual resources. The first four are the resource areas that are common for all three locations.

3.3.1 SOCIOECONOMICS

3.3.1.1 Affected Environment

Greenfield and the rest of Hancock County are within the Indianapolis-Carmel MSA. Section 3.1.1.1 describes the socioeconomic characteristics of the MSA. Table 3-1 shows key socioeconomic indicators for Hancock County. The Hancock County values for population, output, income, and labor force are all in the range of 3 to 4 percent of the comparable values for the entire MSA. In comparing all ten Indiana counties that make up the MSA, Hancock County is the fifth largest contributor to the MSA's total output and the sixth largest contributor in the areas of population, income, and labor force.

3.3.1.2 Environmental Consequences

Environmental consequences are addressed in terms of EnerDel's proposed project and the No-Action Alternative.

3.3.1.2.1 *Proposed Project*

This section addresses potential socioeconomic impacts associated with the proposed activity at the Greenfield, Hancock County location. Section 3.1.1.2.1 addresses the socioeconomic impacts at the MSA level of all three EnerDel facilities combined.

Figure 3-5 shows the estimated changes in workers and annual wages anticipated for the Greenfield location. The values for 2009 represent the current conditions at that location; that is, no EnerDel actions. EnerDel expects to start hiring for the Greenfield facility on a large scale in 2010. As shown in the graph, after 2010, EnerDel anticipates a relatively steady increase to the 2013 levels, when there would about 1,140 people working at the Greenfield facility with annual wages (without fringe benefits) totaling about $44 million.

The increase of about 1,140 workers in the Greenfield location by 2013 represents about 3.3 percent of the Hancock County workforce (Table 3-1) and about 42 percent of the unemployed workers in Hancock County. These are notable percentages of the County's labor force to be associated with a single employer, and there will undoubtedly be beneficial impacts on the County's employment numbers. However, given the relatively small population in Hancock County in comparison with neighboring Marion County and Hamilton County to the northwest, it is very likely that a significant portion of the Greenfield facility workers would come from the more populous areas outside Hancock County. As evident by this scenario, the socioeconomic impacts described at the MSA level in Section 3.1.1.2.1 provide a more appropriate evaluation than assuming all workers at the Greenfield facility were from within Hancock County. With the number of people that will likely be looking for work in the local region, it is expected that most of the added workers would come from within the County and in nearby areas. As a result, impacts associated with in-migration are expected to be very minor.

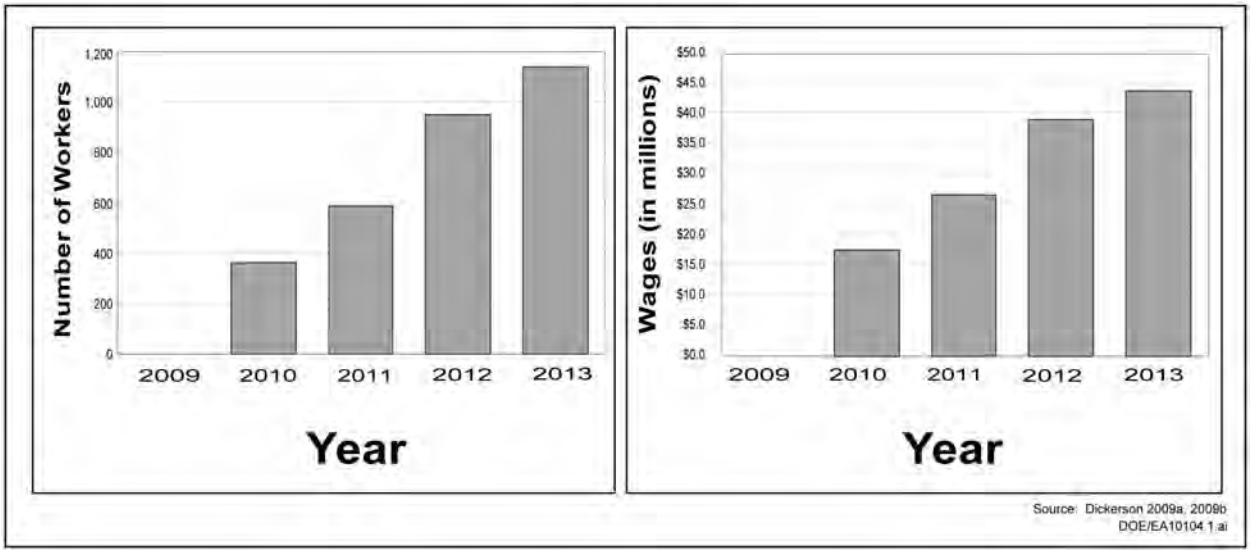

Figure 3-5. Graphs of workers and total wages anticipated for the Greenfield facility from 2009 (current conditions) through 2013.

Reaching total annual wages of about $44 million by 2013 would represent a beneficial influx of income to Hancock County. Were all the workers from within the County, this increase in income would be about 2.2 percent of the County's total income and about 1.8 percent of the County's total output. This represents a notable increase to the County's economy, particularly from a single employer. However, as noted previously, it is very likely that a sizeable portion of the workforce would come from outside Hancock County, so income would be dispersed more than implied by this evaluation. DOE expects the evaluation of socioeconomic impacts at the MSA level (Section 3.1.1.2.1) to be a more realistic scenario. The proposed Greenfield activity would also involve significant purchases of new equipment in order to develop the existing building into a manufacturing facility. However, it is expected that much of this equipment would come from outside the region. This would represent a short-term beneficial effect on the national economy, but have only minor effects on the economy of Hancock County.

3.3.1.2.2 *No-Action Alternative*

Under the No-Action Alternative, DOE would not provide funding to EnerDel, and the development of the EnerDel facility near Greenfield would not occur. The beneficial economic impacts of increased employment and an increase in the tax base of local and state governments would not occur.

3.3.2 UTILITIES, ENERGY, AND MATERIALS

This section describes the current characteristics of the utilities and energy resources in the area of EnerDel's planned facility near Greenfield. As in Section 3.1.2, the utilities addressed are water, sewer, and municipal solid waste, and the energy resources described are electricity and natural gas. Similar to Section 3.1.2, there are no unique or limited materials that would be involved in the actions at Greenfield, so this section does not address materials.

3.3.2.1 Affected Environment

3.3.2.1.1 *Utilities*

Water

The EnerDel facility near Greenfield would obtain its water from Indianapolis Water (Dickerson 2009a). This is the same water system that supplies water to the Indianapolis facility. Section 3.1.2.1.1 describes characteristics of this water system.

Sewer

The EnerDel facility near Greenfield would connect to the Indianapolis sewer system (Dickerson 2009a). This is the same sewer system that serves EnerDel's Indianapolis facility. Section 3.1.2.1.1 describes characteristics of the Indianapolis sewer collection system and the associated advanced wastewater treatment plants.

Municipal Solid Waste

Municipal solid waste from EnerDel's facility near Greenfield would go to the Indianapolis Resource Recovery Facility operated by Covanta Energy. Section 3.1.2.1.1 describes this facility.

3.3.2.1.2 *Energy*

Electricity

EnerDel's facility near Greenfield would get its electricity from Duke Energy, the same power company that provides power to the Noblesville facility. Section 3.2.2.1.2 provides background and describes characteristics of Duke Energy.

Natural Gas

EnerDel's facility near Greenfield gets its natural gas from Vectren, the same natural gas distribution company that provides gas to the Noblesville facility. Section 3.2.2.1.2 provides background and describes characteristics of Vectren. Section 3.1.2.1.2 describes the characteristics of natural gas supply at the state of Indiana level.

3.3.2.2 Environmental Consequences

3.3.2.2.1 *Proposed Project*

Utilities

Water

Similar to its two existing facilities, EnerDel's new Greenfield facility would not be expected to require a significant quantity of process water. Water demand would be due primarily to the personal needs of the workers. EnerDel estimates the Greenfield facility workforce would grow to about 1,140 people in 2013 (Figure 3-5), so the proposed activity would involve a new water demand on the existing water utility, which is the same utility (Indianapolis Water) that provides water to EnerDel's Indianapolis facility.

Estimates of the amount of water that would be needed to support the Greenfield facility are based on values established in the Indiana Administrative Code. As with the Indianapolis and Noblesville facilities, this evaluation uses the estimated water demand for a factory with showers, which is 35 gallons per day per employee (327 IAC 8-3.3-2), even though showers would not be a routine need for EnerDel's workforce. As noted for the Indianapolis facility, use of this conservatively high value should accommodate any minor process needs, such as the wet scrubbers, in the air emissions control equipment.

Assuming the entire Greenfield facility workforce was present on the same day, the expected demand in 2013 (with a workforce of 1,140 people at 35 gallons per day) would be almost 40,000 gallons per day. This quantity represents about 0.029 percent of the 138 million gallons per day that Indianapolis Water produces and distributes (Section 3.1.2.1.1). The increased water demand would have no impact on the existing water system. Even combined with the water demand from the Indianapolis facility, EnerDel's total 2013 water demand on Indianapolis Water would be only about 0.037 percent of the utility's current water production rate. The combined demand would have no impact on the existing water system. Similar to the other EnerDel facilities, the Greenfield facility would operate with three full shifts to accommodate the 1,140 workers; thus, much of the water demand from this facility would be during periods when other system water demands were low.

Sewer

Since EnerDel's facility near Greenfield would not use significant quantities of process water, it also would not produce a significant quantity of process wastewater. As a result, expected sewage loading would be due primarily to the personal needs of the workers, and it is estimated that the facility workforce would grow to about 1,140 people in 2013 (Figure 3-5). As Section 3.1.2.2.1 describes, the Indiana Administrative Code identifies a quantity of 20 gallons per day per employee in a factory without showers and a comparable quantity of 35 gallons per day for a factory with showers (327 IAC 3-6-11) as values to be used in the design of sewer systems when better, more specific data are not available. Although showers are not expected to be a routine need for EnerDel's workforce, this analysis uses the larger number for conservatism and to cover any minor production of process wastewater.

Assuming the entire Greenfield facility workforce was present on the same day, the sewage loading (with a workforce of 1,140 people at 35 gallons per day) is estimated at 39,900 gallons per day in 2013. Based on maps of the sewer system, flow from the Greenfield facility runs to the Southport Wastewater Treatment Plant. The sewage production rate of 39,900 gallons per day represents about 0.03 percent of the 125 million gallons per day treated by the Southport Plant. The increased sewage loading would have no impact on the existing sewer system. Further, with the three full shifts of workers, sewage production would be distributed throughout the day, minimizing the relative effects on the collection system.

Municipal Solid Waste

EnerDel estimates its Greenfield facility would produce about 84 cubic yards of municipal solid waste per week after its development as a manufacturing facility was completed (Dickerson 2009e). This waste would be sent to the Covanta Energy facility for incineration and energy recovery. Using the same estimate in Section 3.1.2.2.1 of up to 500 pounds per cubic yard, the weight of the solid waste produced on a weekly basis would be up to 21 tons. This represents about 0.15 percent of the approximately 13,600 tons per week that is incinerated currently at the Covanta facility. The increased loading of municipal solid waste would have no notable impact on the existing energy recovery system.

Considering the municipal solid waste that would be generated at both the Indianapolis and the Noblesville facilities (also going to the Covanta incinerator), the total amount of municipal waste produced by EnerDel would be up to 30 tons per week. This represents about 0.22 percent of the approximately 13,600 tons per week that is incinerated at the Covanta facility. The increased loading of municipal solid waste would have no notable impact on the existing energy recovery system.

Section 3.3.3 addresses other types of waste that would be generated at the EnerDel Greenfield facility.

Energy

Electricity

EnerDel estimates its Greenfield facility would require 6,345 megawatt hours of electricity per year once it is fully developed as a battery manufacturing facility (Dickerson 2009f). Assuming the facility operates for three full shifts, five days per week, 50 weeks per year, there would be 6,000 hours of operation per year, and the average electric load for the facility would be about 1.1 megawatts. This represents about 0.004 percent of the 27,000 megawatt, multi-state generating capacity of Duke Energy, the electrical power utility that serves the Greenfield facility. The increased electric load would have no impact on the existing electric utility service. The Noblesville facility is also served by Duke Energy, but its electric load is even smaller and, combined with the Greenfield load, would have no impact on the electrical utility service.

Natural Gas

EnerDel estimates its Greenfield facility would require about 470,000 million BTUs of natural gas per year once it is fully developed as a manufacturing facility (Dickerson 2009f). This relatively high demand would be the result of the multiple coating lines and drying ovens proposed for this facility. The facility demand represents about 0.23 percent of the 206,000 billion British thermal units of natural gas Vectren delivered to its Indiana and Ohio customers in 2008. The Greenfield facility's natural gas demand would also be about 0.088 percent of the approximately 536,000 billion British thermal units (or 536,000 million cubic feet) of natural gas used in the entire state of Indiana during 2008. The increased natural gas demand would have no notable impact on the existing natural gas utility service. The Noblesville facility gets its natural

gas from the same utility service (that is, Vectren), but the quantity of natural gas required by the Noblesville facility is insignificant in comparison with that of the Greenfield facility.

3.3.2.2.2 *No-Action Alternative*

Under the No-Action Alternative, DOE would not provide funding to EnerDel, and the development of the EnerDel facility near Greenfield would not occur. The potential environmental impacts to utility and energy resources associated with the development of the EnerDel facility near Greenfield would not occur.

3.3.3 WASTE

Section 3.3.2 describes the management of the municipal solid waste that the proposed project would generate at EnerDel's facility near Greenfield. This section addresses hazardous waste, industrial waste (specifically waste solvent), and materials that are recycled.

3.3.3.1 Affected Environment

Hazardous waste generated at the Greenfield facility would be the same as those described for the Indianapolis facility: one suitable for fuel blending and the other suitable for incineration. In the state of Indiana during 2007, over 28,000 tons of hazardous waste were managed through fuel blending and over 34,000 tons of hazardous waste were incinerated (EPA 2008a).

The Greenfield facility would also produce waste n-methylpyrrolidone (NMP) solvent that would be sent offsite as nonhazardous, industrial waste, but which would also be managed through fuel blending.

Finally, several types of waste materials that would be produced in the Greenfield facility would be sent offsite for recycling. These materials would be similar to those in the other two EnerDel facilities, and would include cardboard, plastic, aluminum, and steel, all of which are recycled heavily throughout the United States. In 2007, there were over 45 million tons of paper and cardboard recovered in the United States, along with about 7 million tons of metals and 2 million tons of plastics (EPA 2008b).

3.3.3.2 Environmental Consequences

3.3.3.2.1 *Proposed Project*

With the proposed project, the amount of hazardous waste that would be produced at the Greenfield facility would be about 6,000 pounds per month, or 36 tons per year, once the facility was fully developed (Dickerson 2009e). The types of hazardous waste produced would be the same as those currently produced at the Indianapolis facility. Approximately 3.6 tons of hazardous waste appropriate for fuel blending and about 32 tons of hazardous waste appropriate for incineration would be produced on a yearly basis (Dickerson 2009g). These values represent very small percentages of the 28,000 tons and 34,000 tons of hazardous waste that are managed

annually through fuel blending and incineration, respectively, at the state level. In addition, these wastes could be sent to permitted hazardous waste treatment facilities located outside of Indiana, so the amount generated by EnerDel could be considered even smaller percentages of larger, multi-state treatment markets. There should be no problem or increased impacts associated with the proper management of the hazardous waste that would be generated at the Greenfield facility. Production and management of the wastes would be tightly regulated and capacity of existing treatment facilities would not be affected by the minor increases in waste quantity.

The operations at the Greenfield facility, and the associated hazardous waste production, would require EnerDel to apply for large-quantity generator status for that facility. Being a large-quantity generator would impose specific hazardous waste management and reporting requirements on the facility, which would help minimize the potential for any adverse impacts. For example, in comparison with a small-quantity generator, the designation of large-quantity generator carries additional recordkeeping and reporting requirements and more restrictive criteria for temporary storage of the waste before it is sent offsite.

EnerDel estimates full operations at the Greenfield facility would produce about 27,000 pounds of NMP waste per month, or about 160 tons per year. As noted previously, although this waste would not be hazardous waste per the *Resource Conservation Recovery Act*, it would be an industrial waste that would also be managed by sending offsite for fuel blending. This quantity represents about 0.58 percent of the amount of waste managed by fuel blending on an annual basis in all of Indiana. Combined with the 54 tons per year that would be produced at the Indianapolis facility, NMP waste sent to fuel blending would increase to about 0.77 percent of the state total. The management approach allows value (that is, its energy content) to be recovered from the waste product and is a well-regulated and acceptable means of managing qualifying waste material. This small added quantity should have no notable impact on existing waste blending facilities.

As with its other facilities, one of EnerDel's objectives is zero waste going into a landfill (Dickerson 2009e). The municipal solid waste discussed in Section 3.3.2 would go to an incinerator for energy recovery, and before being collected for that purpose, EnerDel would segregate specific solid waste for recycling. EnerDel estimates that under full operation of the Greenfield site, there would be about 45 cubic yards of cardboard and 8.4 cubic yards of plastic, aluminum, and steel produced on a weekly basis that would be sent offsite for recycling (Dickerson 2009e). At an estimated 150 pounds per cubic yard for both types of uncompacted, loose waste (EPA 1993) and assuming 50 operational weeks per year, these quantities of waste for recycling equate to about 170 tons of cardboard and 32 tons of plastic, aluminum, and steel on an annual basis. These are insignificant numbers in comparison with the millions of tons of these materials recycled on an annual basis in the United States (Section 3.1.3.1). As long as there is a market for these materials or their value is sufficient that recyclers are willing to take them, no adverse impacts are expected from the proposed waste management actions.

There also would be waste battery cells and aluminum and copper scrap from electrode coating that would be periodically sent offsite for recycling. There are no estimates available for this type of scrap, but EnerDel has established markets for these materials and relative environmental impacts would be expected to be positive as a result of the materials being recycled.

3.3.3.2.2 *No-Action Alternative*

Under the No-Action Alternative, DOE would not provide funding to EnerDel, and the development of the EnerDel facility near Greenfield would not occur. The potential environmental impacts to waste management resources associated with the development of the EnerDel facility near Greenfield would not occur.

3.3.4 TRANSPORTATION

3.3.4.1 Affected Environment

As Section 2.2.3 describes, EnerDel's proposed facility near Greenfield is located about 7.5 miles northwest of the city of Greenfield and 13 miles east of the center of Indianapolis. The facility is on West 300 North, approximately two-thirds of a mile east from where it crosses North 600 West (Figure 2-5). From the point where the two roads intersect, I-70 is about 0.5 mile to the south and there is an interchange (entrance and exit ramps) at that location. Primary access to the EnerDel facility would be north from I-70 on North 600 West, then east on West 300 North. Both North 600 West and West 300 North are major collectors (INDOT n.d.). I-70 is a rural interstate in the area of the North 600 West interchange, but is an urban interstate about 1 mile further west.

The traffic model output provided by Indianapolis Metropolitan Planning Organization (Section 3.1.4.1) covers the area of EnerDel's proposed facility near Greenfield. The area of the I-70 interchange at North 600 West is shown as operating with a volume-to-capacity ratio in the range of 1.5 to 3.2, indicating heavy congestion in that area. To the north of the interchange, North 600 West is in the next highest volume-to-capacity ratio range of 1 to 1.5. I-70 in this area is also shown in the range of 1 to 1.5. Other roads to the north and south of I-70 and toward the east are generally shown with notably lower traffic loadings. West 300 North is not shown on the figure.

3.3.4.2 Environmental Consequences

3.3.4.2.1 *Proposed Project*

With the proposed project, EnerDel estimates the Greenfield facility would grow to a workforce of about 1,140 people in 2013 (Figure 3-5). A significant increase to area traffic would be expected as a result of this number of workers being assigned to an area where there was previously no dense industry of this nature. As with the other two EnerDel facilities, a workforce of this size is based on the premise that the facility would operate three shifts per day. Even if the workforce were evenly divided among the three shifts, there still would be a

workforce of 380 on each shift, and the associated traffic would be moving to and from the facility at every shift change. Once on I-70, this number of additional cars would be relatively minor in comparison with the average annual daily traffic into Indianapolis of 50,000 to 60,000 vehicles based on 2006 and 2007 estimates (INDOT 2009). The largest impacts would be expected to occur on West 300 North, where the EnerDel facility would be located, and on North 600 West, which provides the connection of I-70. Both of these roads are only two lanes and there is an existing traffic light at their intersection. The following factors would tend to mitigate the impact of the added EnerDel traffic in this area:

- With the largest groups of employers being located toward the east in the Indianapolis area, rush hour traffic would be expected to be heaviest toward Indianapolis in the morning and from Indianapolis in the evening. With the predominant available labor force also being located toward the east in the Indianapolis area, it is likely that much of the EnerDel workforce in the facility near Greenfield would be commuting in the opposite direction of the majority of traffic, at least for the day shift.

- Workers coming in from the east on I-70 would be able to exit before reaching the more congested portion of the freeway. Those workers coming from Greenfield would likely have a more reasonable alternative, if necessary, of using county roads and avoiding the congested areas between the facility and I-70.

- During preliminary discussions between EnerDel and Hancock County, the County suggested that it would rank specific road improvements as high priority if EnerDel located the facility near Greenfield. Specifically, the County identified improvements to the intersection of West 300 North and North 600 West and to the adjoining section of West 300 North in order to improve access to trucks and workers (Indiana Economic Digest 2009).

- As noted for the other EnerDel facilities, operations at the facility near Greenfield also would result in additional truck or freight movement to and from the facility. However, these trips would normally be scheduled outside of the normal rush hour periods and with the facility operational for three shifts, some of these vehicle movements could be scheduled for the off-shifts.

DOE expects that traffic conditions near the Greenfield facility would be noticeably heavier as a result of the proposed activity. However, because the facility would be operated in shifts, the location is outside of the more congested areas of Indianapolis, and there is a willingness on the part of the County to take action to improve roads and traffic movement, the adverse impacts are expected to be minor.

EnerDel would routinely remind and caution workers to be aware of the school located to the west of the facility and to drive safely and within speed limits. In addition to the school itself, there are recreational playing fields located behind the school that are undoubtedly utilized during non-school hours.

3.3.4.2.2 *No-Action Alternative*

Under the No-Action Alternative, DOE would not provide funding to EnerDel, and the development of the EnerDel facility near Greenfield would not occur. The potential environmental impacts from increased traffic associated with the development of the EnerDel facility near Greenfield would not occur.

3.3.5 AIR QUALITY

In addition to the discussion of air quality impacts associated with the proposed EnerDel facility near Greenfield, this section provides a discussion of the overall effect of the proposed project on greenhouse gas emissions. This discussion (Section 3.3.5.3) is included in this section because a majority of the EnerDel manufacturing capability would be at the Greenfield location.

3.3.5.1 Affected Environment

The proposed EnerDel facility near Greenfield would be located in an area that is currently in attainment with criteria air pollutants for which National Ambient Air Quality Standards have been established. The 2008 EPA-reported ozone concentration for Hancock County is below the Standards (Table 3-2).

3.3.5.2 Environmental Consequences

Environmental consequences are addressed in terms of the proposed project and the No-Action Alternative.

3.3.5.2.1 *Proposed Project*

Construction

As Section 2.2.3 describes, the Greenfield facility would be developed into a battery manufacturing plant with six electrode coating lines placed within the footprint of an existing building. Minor emissions would be expected as a result of the equipment installation and the minor exterior work to construct pads and containment for one or two small tank farms. These emissions would be controlled as required. For instance, any emissions from transportation vehicles or particulate matter during any excavation would be controlled by best management practices such as maintenance of equipment and spraying water on dry soil.

Operations

As Section 2.2.3 describes, the Greenfield facility would include six manufacturing lines and associated equipment. The lines would include coating operations. EnerDel anticipates that these processes would be the same as those for the Indianapolis facility lines, including the air emission control equipment. That is, EnerDel anticipates that there would be wet scrubbers on the air handling systems involving volatile organic compounds and baghouses on those involving particulate emissions. EnerDel would apply for a construction and operations permit similar to the permit granted for the Indianapolis facility. For the Greenfield facility, EnerDel anticipates

that a New Source Construction and Federally Enforceable State Operating Permit will show volatile organic compounds and hazardous air pollutants exceeding the thresholds for a Title V Major Source. For example, from Table 3-3, if two lines emit 71.98 tons per year with the planned emissions controls, then one would expect six lines to emit about three times as much, or possibly about 216 tons per year. EnerDel would address these matters as part of more detailed planning and permitting for the Greenfield facility. In spite of the likely need for a permit under Title V of the *Clean Air Act*, Table 3-3 also shows that even at three times the air emissions, the proposed Greenfield facility would emit a small portion of the total air pollutants emitted in Hancock County during a year.

3.3.5.2.2 *No-Action Alternative*

Under the No-Action Alternative, DOE would not provide funding to EnerDel, and the development of the EnerDel facility in Greenfield would not occur. The potential environmental impacts to air quality and greenhouse gases (Section 3.3.5.3) associated with the development of the EnerDel facility in Greenfield would not occur.

3.3.5.3 Greenhouse Gas Emissions

As Section 3.3.5 notes, the discussion of greenhouse gas emissions addresses the combined effects of all three EnerDel facilities. Emissions of greenhouse gases during construction would be from exhaust of delivery trucks and limited construction equipment, and would be temporary and minor.

Emissions of greenhouse gases during operation of the EnerDel facilities at full capacity in 2013 would occur primarily from the use of electricity (8,168 megawatt hours per year) and natural gas (628,000 million British thermal units per year) to operate the facilities. Based on data contained in the EPA eGRID database (EPA 2009f), the weighted carbon dioxide emissions factor for electricity generated in the Indiana area is 1,831 pounds of carbon dioxide per megawatt hour of electricity generated.

Based on the natural gas combusted and utilizing emission factors from the *General Reporting Protocol* (The Climate Registry 2008) for carbon dioxide emissions from natural gas firing, the proposed project, with all three facilities considered, would generate a carbon dioxide equivalent of 36,700 tons per year. When carbon dioxide emissions from 8,168 megawatt hours of electricity consumption are considered, and utilizing the data contained in EPA's eGRID database, approximately 7,500 tons of carbon dioxide equivalent would be generated annually. Thus, the proposed project (with all three facilities considered) at full production operation after 2013 would emit 44,000 tons of carbon dioxide per year.

The EnerDel facilities would be capable of producing up to 60,000 electric-vehicle batteries per year when they reach full capacity, and an even larger number of hybrid or plug-in hybrid-electric-vehicle batteries, both of which require fewer cells than the electric-vehicle battery.

Actual manufacturing loads would be expected to be for a combination of battery types, depending on customer demand.

For purposes of the current evaluation, DOE assumed, for example, that at full capacity the combined EnerDel facilities would produce enough batteries for 50,000 electric and 100,000 hybrid-electric vehicles per year by 2013. Driving these 150,000 vehicles in place of non-electric and non-hybrid vehicles has the potential to reduce gasoline consumption, thereby reducing greenhouse gas emissions and offsetting the amount emitted during battery production. An estimate of the amount of greenhouse gas emissions avoided can be calculated based on the following information and assumptions.

- About 47 percent of the new-vehicle sales in 2007 were passenger vehicles and 53 percent were light-duty trucks.
- Current corporate average fuel economy requirements are 27.5 and 22.2 miles per gallon for passenger cars and light-duty trucks, respectively.
- Current electric-hybrid vehicle average fuel mileage is 34 and 23 miles per gallon for cars and light-duty trucks, respectively.
- The combined facilities would produce batteries for 150,000 vehicles per year, with an assumed distribution of 50,000 electric vehicles and 100,000 hybrid-electric vehicles.
- The average distance driven a year for all vehicles is assumed to be 15,000 miles.
- The batteries produced for the electric vehicles would displace approximately 27.5 million gallons of gasoline per year using the identified split between passenger vehicles and light-duty trucks.
- The batteries used for hybrid cars would displace 6.5 million gallons of gasoline per year.

Based on the above assumptions and operating at full capacity, a total of 33.9 million gallons of gasoline would be saved annually through the annual sales and use of batteries and cells for 50,000 electric and 100,000 hybrid electric vehicles. Based upon calculations performed by EPA's Greenhouse Gas Equivalencies Calculator (EPA 2009g) the reduction in gasoline consumption translates to a reduction in greenhouse gas emissions of just under 330,000 tons per year.

For the example full-capacity production of 50,000 electric and 100,000 hybrid electric vehicle batteries, the net greenhouse gas emissions for the EnerDel facilities in full operation after 2013 would be 44,000 tons per year to operate minus about 330,000 tons per year of carbon dioxide emissions reduction from battery sales and use, for a net decrease in carbon dioxide emission for the first full year of operation of 285,000 tons per year. During the second year of operations at full capacity, the plant emissions would remain the same, but the net decrease in carbon dioxide

would be 285,000 tons per year (second year of operation) plus 330,000 tons per year (benefit from the continued use of the 150,000 batteries put into use during the first year), for a total second year net decrease of 615,000 tons per year.

3.3.6 WATER RESOURCES – SURFACE WATER

The EnerDel facility near Greenfield would be the only location of the three with actions taking place outside of existing buildings. As Section 2.2.3 describes, tank farm and emissions control components would be installed immediately adjacent to existing exterior walls. Although the construction actions would be in areas already disturbed during the building's construction, DOE evaluated the construction and use of these components for potential impacts to surface water.

3.3.6.1 Affected Environment

The site of the existing facility that would be occupied by EnerDel is a flat area that is either drained internally to natural low areas or by Buck Creek, which flows through the southeast corner of the commercial property. The creek appears in Figure 2-5 as a dark line (due to vegetation along the creek banks) running through the corner of the highlighted property and beyond in either direction.

Buck Creek originates about 6 miles north of the Greenfield facility and runs in a southerly direction, eventually joining Sugar Creek, which in turn flows into Big Blue River and then Driftwood River. Driftwood River subsequently joins the East Fork of the White River near Columbus, Indiana (Hoggatt 1975). At a U.S. Geological Survey monitoring station near Action, Indiana (about 13 miles south-southwest of the facility), Buck Creek has an average flow of about 43 cubic feet per second based on 41 years of record (USGS 2009). Buck Creek is not on the State of Indiana's list of impaired waters (IDEM 2008b) and the portions in Hancock County have been evaluated and designated regarding their appropriate uses: Category 2 for "recreation use" and "aquatic life use" and a Category 3 for "fishable use." This section of water was not evaluated for use as drinking water, indicating there was no evidence of its use for that purpose. The Category 2 ratings indicate the water has attained some of the designated uses and no use is threatened, but there is insufficient or no data available to determine if all uses in the designation are attained. The Category 3 rating indicates there is insufficient information to determine if any designated use is attained (IDEM 2008b).

As a summary of its characteristics, the available information indicates Buck Creek in the facility area is a stream that meets in-stream water quality standards based on available data and that it is appropriate for at least some recreational uses and aquatic life uses.

Two new buildings are currently at the site of interest; that is, Building 1 that EnerDel would use and Building 2 that is, or will be, on the market for other users. The recent construction included placement of several storm water detention ponds within the built up area. According to the site developer, the pond on the east side of Building 1 is intended to catch runoff from that building and the associated parking area (Dickerson 2009h). The pond acts to detain and even out water

surges from precipitation events before discharging into Buck Creek. There are no identified controls on the pond outlet, so it is presumed the discharge is simply through a drain that is sized to limit the rate at which the applicable runoff can reach the creek.

3.3.6.2 Environmental Consequences

3.3.6.2.1 *Proposed Project*

As Section 2.2.1 describes, EnerDel's facility in Indianapolis has a small tank farm located on the exterior of the building to support the manufacturing process' use of the solvent n-methylpyrrolidone (NMP) and its subsequent collection as waste. The Indianapolis tank farm contains three primary tanks: a storage tank of about 2,000 gallons that is plumbed to receive waste NMP from process line flushes and from a specific sink inside the building; a tank of about 15,000 gallons that receives effluent (NMP and water) from the wet scrubbers; and a second tank of about 15,000 gallons used to store new, unused NMP. EnerDel anticipates the Greenfield facility would require a similar configuration of tanks for the management of new and used NMP. However, the Greenfield facility would ultimately have six coating lines compared with the two coating lines that the Indianapolis tank farm was designed to support. Preliminary plans are for the Greenfield facility to have two small tank farms to accommodate the expanded operations at the facility. The tanks inside the tank farms would also be slightly bigger than those at the Indianapolis facility to make up for production being about tripled (rather than just doubled).

Similar to the Indianapolis facility, the tank farms at the Greenfield location would be constructed so that all tanks were within a secondary containment curbing. The storage area would be designed such that the secondary containment would hold the necessary volume to meet applicable regulatory requirements for the storage of hazardous materials. At a minimum, the tank farm areas and the associated secondary containment curbing would be under a roof similar to the facility in Indianapolis. EnerDel might decide to put full or partial walls around the tank farms. The design of the tank farm areas would also include a loading/unloading pad for trucks to deliver new solvent and remove spent solvent. This pad would be designed so that any released liquid would be contained by draining back into the tank containment or a different containment structure. Similar to the Indianapolis facility, EnerDel plans to locate the wet scrubbers of the off-gas system inside the tank farm containment since those units also contain liquids (and drain back to a tank farm tank).

Finally, the increased manufacturing capability of the Greenfield facility might require that hazardous waste be stored outside of the building. Were this to occur, the waste would be stored in closed containers (such as drums) and the containers would likely be held temporarily in a pre-fabricated shed or similar enclosure. In any case, if the waste in the containers included liquid, the containers would be held within secondary containment devices or structures. EnerDel does not intend any of its operations to be designated as hazardous waste storage facilities, so any waste meeting that definition would be held only temporarily until it was moved offsite to a permitted facility.

EnerDel's management of hazardous materials and waste outside of the building would consider the potential for release through spills, leaks, or equipment malfunctions. However, because the sources of such releases would be inside secondary containment structures, the potential for hazardous materials or waste to reach the environment and be carried away by precipitation runoff is minor. However, should such an event ever happen, EnerDel would be subject to response and reporting requirements.

As Sections 1.4 and 2.2.1 describe, NMP is the liquid chemical of highest use in EnerDel's manufacturing processes. NMP has toxicity concerns, as do essentially all industrial chemicals, and should only be used with appropriate precautions. However, NMP's primary concerns are associated with chronic exposures like those experienced in the work place. NMP has low acute toxicity, so the short-term exposure that would normally be associated with accident conditions, and which could involve the public, would also be considered low risk. Given these characteristics, any such exposures to the public should be avoided or minimized, and EnerDel's health and safety program would include measures to minimize the potential for accidents, including release of hazardous substances.

3.3.6.2.2 *No-Action Alternative*

Under the No-Action Alternative, DOE would not provide funding to EnerDel, and the development of the EnerDel facility near Greenfield would not occur. The potential environmental impacts to surface water resources associated with the development of the EnerDel facility near Greenfield would not occur.

3.3.7 AESTHETICS AND VISUAL RESOURCES

3.3.7.1 Affected Environment

The proposed project includes the use of a recently constructed building near Greenfield for the manufacture of lithium-ion batteries. Prior to construction of the building, the property was in a rural/agricultural setting with only low-density residences in the area. Construction of this building and an adjacent industrial building undoubtedly changed the aesthetics and visual resources of the area and, at least for some people, could be considered a change for the worse. The construction of these new buildings and the associated development of the section of land are not, however, part of the proposed project and were not done by EnerDel or funded by DOE. The affected environment now includes the partially developed section of land (shown in Figure 2-5 before the development) and the only potential impacts addressed below are those associated with EnerDel's proposed use of Building 1 in the development.

3.3.7.2 Environmental Consequences

3.3.7.2.1 *Proposed Project*

With the proposed project, EnerDel would develop the building near Greenfield into a battery manufacturing facility. With only limited exceptions, this would be done through the installation

of equipment and materials inside the building, and these actions would have no lasting impacts on aesthetics and visual resources of the area. The exceptions are the minor additions that EnerDel would have to make to the building's exterior. These exterior actions would include the construction and placement of the small tank farms described in Section 3.3.6 and the air emissions control equipment, all of which would be located up close to the exterior walls of the building. The air emissions equipment would include stacks that would likely have to extend higher than the building's roof. These would include stacks from up to six wet scrubbers and two or three baghouses. Items outside the facility could also include the pre-fabricated sheds or other enclosures that could be used for temporary storage of hazardous waste.

The additions that EnerDel would make to the exterior of the existing building are considered relatively minor and likely would not be considered by observers as impairing aesthetic and visual resources beyond that already done by the building's existence.

3.3.7.2.2 *No-Action Alternative*

Under the No-Action Alternative, DOE would not provide funding to EnerDel, and the development of the EnerDel facility near Greenfield would not occur. The potential environmental impacts to aesthetics and visual resources associated with the development of the EnerDel facility near Greenfield would not occur.

4. CUMULATIVE IMPACTS

Council on Environmental Quality regulations stipulate that the cumulative effects analysis within an EA consider the potential environmental impacts resulting from the "incremental impacts of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such actions" (40 CFR 1508.7). This chapter addresses potential cumulative impacts.

EnerDel has only been in existence since 2004, when parent company Ener1 acquired the lithium-ion battery operations of Delphi Corporation, so the existing facilities in Indianapolis and Noblesville have not operated long as EnerDel facilities. The Indianapolis facility has 92,000 square feet of floor space, and the Noblesville facility has about 32,000 square feet. Both sites consist of disturbed lands that have been used for industrial uses for years. Both sites have sufficient access, onsite roads, and the infrastructure to support expanded operations.

Past environmental impacts from historical operations at both plants are captured as part of existing baseline conditions. For most environmental resource areas, there would be no-to-minimal measurable incremental impacts (see Chapter 1, Section 1.4). Therefore, it is unlikely these environmental resource areas would combine with other present or reasonably foreseeable actions, singularly or collectively, to substantially impact the environment.

In comparison with historical levels of operations, the proposed expanded operations at the two existing facilities (Indianapolis and Noblesville) and at the newly acquired third facility near Greenfield would contribute small incremental impacts to air emissions, wastewater discharges, solid and hazardous waste generation, water and energy (electricity and natural gas) use, and vehicle traffic. The minor amount of construction at the Greenfield facility would involve only small amounts of waste and temporary equipment emissions and noise. At all three facilities, expanded operations would result in the use of additional raw materials, but none that are considered to come from a limited resource or have limited availability in the world market. As a result, the amounts of these materials would not combine with other actions to form a significant impact.

Expanded operations would result in an increase in the two existing facilities' employment base, and developing the third facility into a manufacturing plant would provide new employment opportunities. Each facility would result in the creation of indirect jobs, representing a positive increase in regional employment.

The expanded operations at either the Indianapolis or Noblesville facilities would have little cumulative impact because the plants are on existing disturbed lands that have been industrial sites for many years. In addition, the incremental increases from each plant's expanded operations would be small and within permitted limits. The newly acquired facility near Greenfield is also an existing facility, but the proposed project would represent its initial usage since its construction. In addition to the economic benefits that would be experienced in the

area, new operations at the Greenfield facility would have incremental cumulative impacts in most resource areas evaluated, possibly the most notable from air emissions due to the quantity of volatile organic compounds that would be emitted, and from traffic because existing traffic levels are generally congested even on the outskirts of Indianapolis. Operations at this facility would also be within permitted limits.

5. CONCLUSIONS

DOE's Proposed Action would co-fund EnerDel's expansion of battery manufacturing facilities at three separate Indiana locations. The expansion of operations at the EnerDel locations in Indianapolis and Noblesville, Indiana, would take place within existing facilities. The action near Greenfield, Indiana, would develop an EnerDel battery manufacturing plant within an existing vacant facility.

The analyses for this EA considered all environmental disciplines, or resource areas, DOE typically includes in NEPA documents. DOE considered its proposed actions of providing EnerDel with one or more types of financial assistance and EnerDel's proposed project to expand operations at two facilities and start up newly developed capacities at a third facility. Accordingly, all three locations were evaluated even though, individually, the actions at the Noblesville facility and the Indianapolis facility may have qualified for Categorical Exclusion from further NEPA evaluation. After a preliminary evaluation, DOE decided not to carry several resource areas forward to a characterization of the affected environmental and detailed analyses of potential impacts. This was done in instances where there would be no impacts, impacts would be too small to characterize, or impacts would only occur for short durations. In addition, all three sites consist of previously disturbed lands already designated for industrial use, and potential impacts would be unlikely beyond the site boundaries. The resource areas, with applicable locations, that DOE did not carry forward include:

- Aesthetics and visual resources – Indianapolis and Noblesville locations
- Air quality – Noblesville location
- Biological resources – all locations
- Cultural resources – all locations
- Environmental justice – all locations
- Geology and soils – all locations
- Water resources
  - Groundwater, floodplains, and wetlands – all locations
  - Surface water – Indianapolis and Noblesville locations
- Occupational health and safety – all locations
- Land use – all locations
- Noise – all locations
- Utilities, energy, and materials
  - Materials – all locations

In comparison with historical levels of operations, the proposed expanded operations at the Indianapolis and Noblesville sites would contribute small incremental impacts to wastewater discharges, solid and hazardous waste generation, and water and energy (electricity and natural gas) use. The Indianapolis facility would also see incremental impacts to air quality; the additional emissions are already addressed in the existing air permit for the facility.

Development of the Greenfield facility into a battery manufacturing plant would result in new air emissions, wastewater discharges, solid and hazardous waste generation, and water and energy (electricity and natural gas) use. Air emissions would require regulatory approval in the form of a new air permit. The other elements would be at quantities that could be readily accommodated by existing services. The Greenfield facility would also result in increased traffic in an area already congested by current traffic levels.

Expanded operations would result in an increase in the Indianapolis and Noblesville facility employment bases and result in the creation of indirect jobs. Development of the Greenfield facility into a new battery manufacturing plant would result in a new employment base for that location along with the creation of indirect jobs.

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Appendix A. Distribution List

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