7 COST BENEFIT ANALYSIS

This chapter summarizes costs and benefits associated with the proposed action and the no-action alternative. Chapter 4 of this Draft Environmental Impact Statement (Draft EIS) discusses the potential socioeconomic impacts of the construction, operation, and decommissioning of the proposed National Enrichment Facility (NEF) by the Louisiana Enrichment Services (LES).

The implementation of the proposed action would generate national, regional, and local benefits and costs. The national benefits of building the proposed NEF include a greater assurance of a stable domestic supply of low-enriched uranium. The regional benefits of building the proposed NEF are increased employment, economic activity, and tax revenues in the region around the site. Some of these regional benefits, such as tax revenues, accrue specifically to Lea County and the City of Eunice. Other benefits may extend to neighboring counties in Texas. Costs associated with the proposed NEF are, for the most part, limited to the area surrounding the site. Examples of these environmental impacts would include increased road traffic and the presence of temporarily stored wastes. However, the impact of these environmental costs on the local community are considered to be SMALL.

7.1 No-Action Alternative

Under the no-action alternative, the proposed NEF would not be constructed or operated in Lea County, New Mexico. The proposed site would remain undisturbed, and ecological, natural, and socioeconomic resources would remain unaffected. All potential local environmental impacts related to water use, land use, ground-water contamination, ecology, air emissions, human health and occupational safety, waste storage and disposal, disposition of depleted uranium hexafluoride (DUF_6), and decommissioning and decontamination would be avoided. Similarly, all socioeconomic impacts related to employment, economic activity, population, housing, community resources, and financing would be avoided.

7.2 Proposed Action

Under the proposed action, LES would construct, operate, and decommission the proposed NEF in Lea County, New Mexico. In support of this proposed action, the U.S. Nuclear Regulatory Commission (NRC) would grant a license to LES to possess and use source material, byproduct, and special nuclear material in accordance with the requirements of Title 10, "Energy," of the *U.S. Code of Federal Regulations* (10 CFR) Parts 30, 40, and 70. The proposed NEF would be constructed over an eight-year period with operations beginning during the third construction year. Production would increase as additional cascades are completed and reach full production approximately seven years after initial ground breaking. Peak enrichment operations would continue for about 13 years, and then production would gradually wind-down as decommissioning and decontamination begins. The principal socioeconomic impact or benefit from the proposed NEF would be an increase in the jobs in the region of influence. The region of influence is defined as a radius of 120 kilometers (75 miles) from the proposed NEF. Enrichment operations and decommissioning and decontamination would overlap for about five years. As production winds-down, some operations personnel would gradually migrate to decommissioning and decontamination activities.

Based on the current population of the region of influence (i.e., 82,982 people in 2000), the limited number of new people and jobs created by the construction and operation of the proposed NEF in the region of influence would not be expected to lead to a significant change in population or cause a significant change in the demand for housing and public services. The total population increase at peak construction would be estimated to be 280 residents and less during later construction stages and facility

operations. With 15 percent of housing units currently unoccupied, no housing demand impact is expected during facility construction and operation. Further, any additional demand for public services would not be significant given the small change in population.

The construction and operation of the proposed NEF would provide additional tax revenues to the State of New Mexico, Lea County, and the city of Eunice. Tax revenues would accrue primarily to the State of New Mexico through an increase in gross receipts taxes and corporate income taxes. Over the 30-year operating life of the proposed NEF, estimated property taxes could range between $10 and $14 million (LES, 2004a). Table 7-1 shows a summary of the estimated tax revenue to the State and local community during the life of the proposed NEF.

Table 7-1 Summary of Estimated Tax Revenues to State and Local Communities Over 30 Year Facility Life (in 2002 dollars)

Type of Tax [a]		New Mexico	Lea County	Total
Gross Receipts Tax				
	High Estimate	$ 32,300,000	$ 1,700,000	$ 34,000,000
	Low Estimate	$ 21,850,000	$ 1,150,000	$ 23,000,000
NM Corporate Income Tax [b]				
	High Estimate	$ 140,000,000	N/A [c]	$ 140,000,000
	Low Estimate	$ 120,000,000	N/A [c]	$ 120,000,000
NM Property Tax				
	High Estimate	–	$ 14,000,000	$ 14,000,000
	Low Estimate	–	$ 10,000,000	$ 10,000,000

[a] Tax values are based on tax rates as of April 2004.
[b] Based on average earnings over the life of the proposed NEF.
[c] Allocation would be made by the State of New Mexico.
Source: LES, 2004a

7.2.1 Costs Associated with Construction Activities

The proposed NEF is estimated to cost $1.2 billion (in 2002 dollars) to construct. This excludes escalation, contingencies, and interest. About one-third of the cost of constructing the proposed NEF would be spent locally on goods, services, and wages. Construction jobs are expected to pay above average wages for the Lea County region (LES, 2004a).

Construction of the proposed NEF would provide up to 800 construction jobs during the peak construction period and an average of 397 jobs per year for the 8 years of construction. Construction of the proposed NEF would have indirect economic impacts by creating an average of 582 additional jobs in the community each year (Figure 4-4). The combined direct and indirect jobs expected to be created would provide a moderately beneficial socioeconomic impact for the communities within the region of influence. Due to the transitory nature of the construction crews, the projected influx of workers and their families during construction would have only a SMALL impact on the housing vacancy rate and demand for public services (LES, 2004a).

7.2.2 Costs Associated with the Operation of the Proposed NEF

Operation of the proposed NEF would provide a maximum of 210 full-time jobs with an average of 150 jobs per year over the life of the facility (Figure 4-4). These 210 direct jobs would generate an additional 173 indirect jobs on average in the region of influence. The combination of the direct and indirect jobs would have a MODERATE impact on the economics of the communities within the region of influence. Most of the impact would be a direct result of the $10.5 million in payroll and another $9.6 million in purchases of local goods and services LES expects to spend during peak operations (LES, 2004a). The influx of workers would have only a SMALL impact on the vacancy rates for housing in the region of influence, and purchase of local goods and services would have a similar SMALL impact on the supply and demand for the region of influence. The jobs are expected to pay above average wages for Lea County, New Mexico.

The size of the socioeconomic impacts are defined as follows in this Draft EIS:

- *Employment/economic activity – Small is <0.1-percent increase in employment; moderate is between 0.1- and 1.0-percent increase in employment; and large is defined as >1-percent increase in employment.*
- *Population/housing impacts – Small is <0.1-percent increase in population growth and/or <20-percent of vacant housing units required; moderate is between 0.1- and 1.0-percent increase in population growth and/or between 20 and 50 percent of vacant housing units required; and large impacts are defined as >1-percent increase in population growth and/or >50 percent of vacant housing units required.*
- *Public services/financing – Small is <1-percent increase in local revenues; moderate is between 1- and 5-percent increase in local revenues large impacts are defined as >5-percent increase in local revenues.*

Source: NRC, 1999; DOE, 1999.

7.2.3 Costs Associated with Disposition of the DUF_6

The proposed NEF would generate two components, low-enriched uranium hexafluoride (or product), and DUF_6. The low-enriched uranium would be sold to nuclear fuel fabricators. During operation, the proposed NEF would generate approximately 7,800 metric tons (8,600 tons) of DUF_6 annually during peak operations. This would be stored in an estimated 627 uranium byproduct cylinders (UBCs) each year. These UBCs would be temporarily stored onsite on an outside storage pad. The storage pad could ultimately have a capacity of 15,727 UBCs, which would be sufficient to store the total cumulative production of DUF_6 over the 30-year expected life of the facility (LES, 2004a).

The NRC evaluated several alternatives to the LES proposed action. As part of its evaluation of the proposed action, the NRC evaluated two options for disposal of the DUF_6; (1) conversion by a privately-owned facility, and (2) conversion by a DOE facility. LES's preferred approach is transporting the material to a private conversion facility. Section 4.2.14.3 of this Draft EIS discusses the DUF_6 disposal options.

There are numerous possible pathways for the transport, conversion, and disposal of DUF_6 (LLNL, 1997). In addition, there are some potentially beneficial uses for DUF_6 (Haire and Croff, 2004). For example, DUF_6 has been used in a variety of applications ranging from munitions to counterweights, and attempts are being made to develop new uses that potentially could mitigate some or all of the costs of DUF_6 disposition (Haire and Croff, 2004). However, the current inventory of depleted uranium in the U.S. far exceeds the current and near-term future demand for the material. For each of the two disposition options, it is assumed that the most tractable disposition pathway and the one supported by the NRC is to convert the DUF_6 to a more stable oxide form (U_3O_8) and dispose of the material in a licensed disposal facility.

LES is required to put in place a financial surety bonding mechanism to assure that adequate funds would be available to dispose of all DUF_6 generated by the proposed NEF (10 CFR § 70.25). The amount of funding LES proposes to set aside for DUF_6 disposition is $5.50 per kilogram of uranium (LES, 2004a; LES, 2004b). This amount is based on LES' estimate of the cost of converting and disposing of all DUF_6 generated during operation of the proposed NEF. This is consistent with three independent cost estimates obtained by LES. The NRC will evaluate the adequacy of the proposed funding in the Safety Evaluation Report.

DUF_6 Disposition Options Considered

Option 1a: Private Conversion Facility (LES Preferred Option). Transporting the UBCs from the proposed NEF to an unidentified private conversion facility outside the region of influence. After conversion to U_3O_8, the wastes would then be transported to a licensed disposal facility for final disposition.

Option 1b: Adjacent Private Conversion Facility. Transporting the UBCs from the proposed NEF to an adjacent private conversion facility. This facility is assumed to be adjacent to the site and would minimize the amount of DUF_6 onsite by allowing for ship-as-you-generate waste management of the converted U_3O_8 and associated conversion byproducts (i.e., CaF_2). The wastes would then be transported to a licensed disposal facility for final disposition.

Option 2: DOE Conversion Facility. Transporting UBCs from the proposed NEF to a DOE conversion facility. For example, the UBCs could be transported to one of the DOE conversion facilities either at Paducah, Kentucky, or Portsmouth, Ohio (DOE, 2004a; DOE, 2004b). The wastes would then be transported to a licensed disposal facility for final disposition.

Under the disposition options considered in this Draft EIS, the DUF_6 would be converted to U_3O_8 at a conversion facility located either at a private facility outside the region of influence (Option 1a); at a private conversion facility within the region of influence of the proposed NEF (Option 1b); or at the DOE conversion facilities to be located at Portsmouth, Ohio, and Paducah, Kentucky (Option 2). Conversion of the maximum DUF_6 inventory which could be produced at the proposed NEF could extend the time of operation by approximately 11 years for the Paducah conversion facility or 15 years for the Portsmouth conversion facility.

The conversion facilities at Paducah and Portsmouth would have annual processing capacities of 18,000 and 13,500 metric tons DUF_6, respectively (DOE, 2004c). Assuming a completion date of 2006 for these conversion facilities, the stockpiles held at Paducah could be processed by the year 2031, and the stockpiles destined for the Portsmouth conversion facility could be converted by the year 2025. Production at the proposed NEF is scheduled to cease by the year 2034. Therefore, the Portsmouth

facility could begin processing the accumulated DUF_6 in 2026 and have nearly all of the accumulated UBCs processed by 2038, which is the time decommissioning and decontamination activities are scheduled to end.

Converting the accumulated proposed NEF DUF_6 could therefore extend the socioeconomic impacts of one of these facilities. It is estimated that slightly more than 300 direct and indirect jobs would be created by each conversion facility at Portsmouth and Paducah, each with a total annual income of approximately $13 million (2002 dollars) (DOE, 2004a; DOE, 2004b). While a conversion facility within the region of influence of the proposed NEF or at another private site would be designed with a slightly smaller processing capacity, it can be assumed that the socioeconomic operational impacts would be smaller than, and therefore bounded by, the DOE facilities.

For a new conversion facility with a lower processing capacity constructed near the proposed NEF or at another location, the construction impacts would be approximately 180 total jobs created for a total annual income of $6.9 million. Construction would take place in a two-year period (DOE, 2004a and 2004b). Operating the facility would create about 185 jobs (direct and indirect) with a total annual income of $7.4 million.

The disposition costs for temporarily storing the UBCs until decontamination and decommissioning begins would be minimal for the first 21 years of operation of the proposed NEF but would increase as DUF_6 is shipped offsite. These costs, which include construction of the UBC storage pads and ongoing monitoring of the UBCs, would be small relative to costs for construction and operations. A private facility would be able to begin the conversion and disposal process immediately upon being constructed, reducing the cost of constructing additional storage pads at the proposed NEF. The DOE conversion facilities could accept DUF_6 as it is generated by the proposed NEF or DOE could wait until completion of conversion of their own materials before accepting DUF_6 from the proposed NEF. In 2002 dollars, the cumulative cost of DUF_6 disposition would be $731 million using the $5.50 per kilogram of uranium estimate (LES, 2004a).

Disposition Options 1a and 2 (using a private conversion facility outside the region of influence or using the DOE conversion facilities, respectively) are similar in terms of environmental impact. Specific offsite impacts would depend on the timing of the shipments, the location of the conversion facility, length of storage at the conversion facility prior to processing, and the location and type of final burial of the U_3O_8.

A private conversion facility located within the region of influence would result in the smallest onsite accumulation of DUF_6. All shipments offsite would occur shortly after generation, and the material would be quickly converted to oxide and shipped to a final disposal site. The effect of storage would be to delay conversion and shift cost curves to the future.

7.3 Costs Associated with Decommissioning Activities

Approximately 21 years after initial groundbreaking, the proposed NEF would begin the shutdown of operations and LES would initiate the decommissioning and decontamination process. As the enrichment cascades are stopped and the site decontamination starts, some of the operational jobs would be eliminated. LES estimates that 10 percent of the operations workforce would be transferred to decommissioning and decontamination activities while other operations personnel would be gradually laid off. It is also possible that private contractors could be used to decontaminate and decommission the proposed NEF.

Using current decommissioning and decontamination techniques, it is estimated that the total workforce during most of the decommissioning and decontamination effort would average 21 direct jobs per year with an additional 20 indirect jobs for part of the 9 years required to complete the decommissioning and decontamination activities. The pay scale on the decommissioning and decontamination jobs would be slightly lower than that paid during operation, but it would still be higher than the general average for the region of influence.

Implementation of decommissioning and decontamination activities would have a SMALL socioeconomic impact on the region of influence. LES estimates the total cost of decommissioning to be about $837.5 million. Completion of the decommissioning and decontamination activities would result in a shutdown facility with no employees. The site structures and some supporting equipment would remain and be available for alternative use.

7.4 Summary of Benefits of Proposed NEF

Implementation of the proposed action would have a moderate overall economic impact on the region of influence. Table 7-2 summarizes the expenditures and jobs expected during each phase of the proposed project.

Table 7-2 Summary of Expenditures and Jobs Expected to be Created

Project Phase	Expenditures (in 2003 dollars)	Number of Jobs	
		Direct	Indirect
Construction	Total - $ 1.2 billion Local - $ 390 million	397 (average) 800 (peak)	582 (average)
Operations	$ 23.2 million (annual at peak operations)	150 (average) 210 (peak)	173 (average)
Decommissioning and Decontamination	$ 837.5 million ($106.3 million excluding DUF_6 disposition)	21	20

Decommissioning of the proposed NEF would be phased in over a nine-year period. During this time, the number of jobs would slowly decrease, and the types of positions would switch from operations to decontamination and waste shipment.

Under temporary storage of UBCs during the operational life of the proposed NEF, the DUF_6 would remain onsite until the start of decommissioning. It would then be shipped to a conversion facility for processing and disposal. This would require the maximum number of jobs for surveillance and maintenance of the DUF_6 during the operating phase of the proposed NEF.

Table 7-3 shows a summary of the socioeconomic impacts of the proposed action with the various DUF_6 disposal options.

Table 7-3 Socioeconomic Benefits of the Proposed Action with DUF_6 Disposition Options

Benefit/Cost	No Action	Proposed Action with Proposed DUF_6 Disposition Option		
		Temporary Storage	Options 1a and 1b	Option 2
Need for Facility				
National Energy Security	No Local Impact	Increased Supply Security	Increased Supply Security	Increased Supply Security
Construction				
Employment/ Economic Activity	No Local Impact	Moderate Local Impact	Moderate Local Impact	Moderate Local Impact
Population/Housing	No Local Impact	Small Impact	Small Impact	Small Impact
Public Services/ Financing	No Local Impact	Small Impact	Small Impact	Small Impact
Operations				
Employment/ Economic Activity	No Local Impact	Moderate Local Impact	Moderate Local Impact	Moderate Local Impact
Population/Housing	No Local Impact	Small Impact	Small Impact	Small Impact
Public Services/ Financing	No Local Impact	Small Impact	Small Impact	Small Impact
Decontamination & Decommissioning				
Employment/ Economic Activity	No Local Impact	Small Impact	Small Impact	Small Impact
Population/Housing	No Local Impact	Small Impact	Small Impact	Small Impact
Public Services/ Financing	No Local Impact	Small Impact	Small Impact	Small Impact
Tails disposition				
Disposition Costs	No Local Impact	Requires Maximum Surveillance and Maintenance of Inventory	Surveillance and Maintenance Depends on Timing of Shipments. Option 1b – No Additional Expenditures Required to Monitor and Maintain Inventory	Surveillance and Maintenance Depends on Timing of Shipments
Employment/ Economic Activity	No Local Impact	Small Impact	Option 1a – Small Impact Option 1b– Moderate Impact to Employment with Presence of DUF_6 Conversion Facility	Small Impact

Benefit/Cost	No Action	Proposed Action with Proposed DUF_6 Disposition Option		
		Temporary Storage	Options 1a and 1b	Option 2
Population/Housing	No Local Impact	Small Impact	Option 1a – Small Impact Option 1b – Small Impact	Small Impact
Public Services/ Financing	No Local Impact	Small Impact	Option 1a –Small Impact Option 1b – Small Impact	Small Impact

Disposition options:
Option 1a – Private DUF_6 conversion facility located outside the region of influence.
Option 1b – Private DUF_6 conversion facility located inside the region of influence.
Option 2 – Transport the UBCs from the proposed NEF site to a DOE conversion facility.

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