also depend on the current status of the existing power plant. If the plant is currently operating, then repowering may reduce effects; if the plant is no longer operating, then repowering with a baseload NGCC facility will create more significant impacts.

Table 8-3. Summary of Environmental Impacts of the NGCC Alternative Located at IP2 and IP3 and an Alternate Site

Impact Category	At IP Site or a Repowered Site		New Site	
	Impact	Comments	Impact	Comments
Land Use	SMALL to MODERATE	Onsite land used; most has been previously disturbed.	MODERATE to LARGE	About 90 ha (220 ac) needed for plant construction; additional land may be needed for pipeline and transmission line ROWs.
Ecology	SMALL	Both terrestrial and aquatic impacts would be SMALL because the plant uses mostly disturbed land and uses relatively little water.	SMALL to MODERATE	Impacts would depend on the nature of the land used for the plant and whether a new gas pipeline and/or transmission lines are needed; cooling water would have SMALL aquatic resource impacts.
Water Use and Quality	SMALL	Minor erosion and sedimentation may occur during construction. The plant would use no groundwater.	SMALL to MODERATE	With closed-cycle cooling, the impact would likely be SMALL. Impact depends on the volume of used and characteristics of the water body; impacts from water use conflicts could be MODERATE.
Air Quality	SMALL to MODERATE	• SO_x: 150 MT/yr (164 tons/yr) • NO_x: 493 MT/yr (543 tons/yr) • PM_{10}: 83 MT/yr (92 tons/yr) • CO: 103 MT/yr (113 tons/yr) • CO_2: 5.5 million MT/yr (6.1 million tons/yr)	SMALL to MODERATE	Operational impacts are the same as onsite plant but more emissions from additional construction activities.

Table 8-3 (continued)

Impact Category	At IP Site or a Repowered Site		At a New Site	
	Impact	Comments	Impact	Comments
Waste	SMALL	Small amounts of construction waste would be generated.	SMALL	Small amounts of construction waste with some recycling options; land-clearing debris could be land filled on site.
Human Health	SMALL	Minor risk to workers associated with construction and industrial accidents. Health effects from operational emissions are likely to be SMALL.	SMALL	Same as onsite plant.
Socioeconomics	SMALL to MODERATE	Impacts on housing and jobs in the area surrounding IP2 and IP3 during onsite construction and operation would be relatively minor based on the large population of the area surrounding IP2 and IP3; similar at a repowered site.	SMALL to MODERATE	Construction impacts would likely be no larger than MODERATE at most sites. The largest impacts occur during construction.
Transportation	SMALL to MODERATE	Increased traffic associated with construction could be noticeable, though the number of construction workers is smaller than the number of workers currently at IP2 and IP3; impacts at repowered site likely similar.	SMALL to MODERATE	Transportation impacts associated with construction and operating personnel to the plant site would depend on the population density and infrastructure in the vicinity of the site.

Table 8-3 (continued)

Impact Category	At IP Site or a Repowered Site		At a New Site	
	Impact	Comments	Impact	Comments
Aesthetics	SMALL	The impact is likely less than the impacts of the current plant; more land would be cleared and new structures built; repowered site impacts likely to be similar to those of existing structures.	SMALL to LARGE	The greatest impacts would be from new transmission lines, gas line ROW, and plant structures. Impacts depend on the nature of the site.
Historical and Archeological Resource	SMALL to MODERATE	Impacts may reach MODERATE on IP site; most repowerings likely to be SMALL.	SMALL to MODERATE	An alternate location would necessitate cultural resource studies; construction would likely avoid highly sensitive areas. Impacts likely would be managed or mitigated.
Environmental Justice	SMALL to LARGE	SMALL at IP site; SMALL to LARGE at repowered site.	SMALL to LARGE	Impacts would vary depending on population distribution and location of the new plant site.

8.3.2 Purchased Electrical Power

Based on currently scheduled unit retirements and demand growth projections, the NYISO predicted in 2006 that up to 1600 MW(e) from new projects not yet under construction would be needed by 2010 and a total of up to 3300 MW(e) by 2015 (National Research Council 2006).

Within the New York Control Area (NYCA), State power regulators require that load-serving entities (LSE), or power buyers, purchase enough generating capacity to meet their projected needs plus a reserve margin (National Research Council 2006). Entergy is not an LSE. In New York, Entergy owns and operates power plants, but not transmission or distribution systems; therefore, Entergy does not purchase power from other power generators. To replace the output from IP2 and IP3, LSEs, like Consolidated Edison, would need to purchase additional electric power from other sources, which could include new fossil-fueled power plants or renewable alternatives, or it could purchase power from existing facilities at other sites outside the NYCA (National Research Council 2006). Given New York State's power market, all alternatives considered here could supply purchased power. The only constraint on the purchase of electrical power then becomes electric transmission capacity.

Power sources within NYCA have an installed capacity of about 38,000 MW(e) and more than 6300 km (3900 mi) of high-voltage transmission lines (National Research Council 2006). The current power transmission infrastructure makes it difficult to purchase power from outside the southern regions of the NYCA (namely the New York City and Long Island load zones) because there are power transmission constraints or "bottlenecks" between the southern load zones and other power generating areas to the east and north, including Canada. These neighboring areas would be needed to supply additional purchased power to replace power generated by IP2 and IP3. Because of the bottlenecks in the transmission lines, new transmission capacity would likely be necessary to efficiently move purchased power into the southern load zones and provide a partial solution to the retirement of IP2 and IP3 (National Research Council 2006). Such new transmission capacity would likely come in the form of either an expansion of the existing high-voltage alternating current transmission system or the addition of new high-voltage direct current transmission facilities (National Research Council 2006).

The National Research Council found that improvements in transmission capability could significantly relieve congestion in the NYCA and increase delivery capacity from existing and potential electric generation resources to the southern load zones. The Council has proposed a 550-MW(e) west-to-east line across the Hudson River and a new north-to-south transmission line (up to 1000 MW(e)) for better access to upstate New York and Canadian electric resources to provide useful capacity in the 2010 and 2015 time period (National Research Council 2006). However, a variety of institutional and financial obstacles often stand in the way of such plans. In 2006, the Council determined that a "concerted, well-managed, and coordinated effort would be required to replace IP2 and IP3 by 2015 (National Research Council 2006).

Several new transmission projects are currently in planning stages. NRC staff will address two of the proposed projects here as illustrative of the potential for new transmission in congested areas of New York State.

As of November 2010, New York Regional Interconnection (NYRI is seeking the approval of the New York Public Service Commission (NYPSC) to build a 306-km (190-mi) transmission line with a rated power flow of 1200 MW(e) from the Town of Marcy in Oneida County to the towns of Hamptonburgh and New Windsor in Orange County, New York (NYRI 2010). In accordance with the NYRI application to the NYPSC, overhead transmission lines will make up approximately 89 percent of the proposed route, and underground cable will constitute the remainder of the route (NYRI 2008). NYRI has placed the proposed route within or parallel to existing or inactive railroads and energy ROWs for approximately 78 percent of its distance. For the remaining 22 percent of its distance, NYRI will construct the transmission lines in undeveloped areas or areas where there are no existing ROWs. The proposed transmission corridor includes 1155 ha (2854 ac). If approved, NYRI will clear 768 ha (1898 ac) of forested habitat during construction. While the proposed route minimizes the amount of land clearing and habitat destruction necessary, the proposed route also crosses sensitive habitats such as streams and wetlands (NYRI 2008).

NYRI has proposed to construct additional transmission capacity that could be used to import power into the southern load zones for the NYCA, with the potential for it to expand its proposed 1200-MW(e) capacity to 2400 MW(e). In addition, other proposed projects, like CHPEI, have the potential to import additional power from Canada. In the case of CHPEI, the total project would include 2000 MW(e) of transmission, though only 1000 MW(e) would be targeted to the New York metropolitan area (CHPEI 2010). CHPEI is currently in the permitting process, and

expects to be operational by 2015. The NRC staff recognizes that purchased power could be an alternative to IP2 and IP3. To the extent that new transmission projects allow other existing facilities to provide additional power to downstate New York, the environmental impacts are likely to be only the incremental impacts of additional operation. Upstate hydropower, wind power, biomass, nuclear and fossil-fueled plants would likely contribute to additional power supply. On CHPEI, project developers indicate that they expect Canadian hydro and wind power to dominate their power supply (Canada relies extensively on hydropower for its current generation).

To the extent that new generation capacity supplies power to these new projects, construction impacts may be similar to those of other alternatives in this SEIS. New hydropower in Canada, for example, may have substantial environmental impacts during construction and operation.

The actual environmental impacts of purchased power are difficult to determine, Each type of power generation alternative has its own set of potential environmental costs and benefits, and each must be evaluated with respect to the specific location and features of the generator. As a result, the specific environmental impacts of purchased power cannot be reasonably evaluated in the absence of more information. Nonetheless, it is highly likely that any generating source of purchased power will have environmental impacts, the type and magnitude of which cannot be assessed for comparative purposes as an alternative to license renewal of IP2 and IP3. It is also highly likely that projects like NYRI and CHPEI will have separate State, and in the case of CHPEI, Federal, processes for determining environmental impacts. In general, any transmission project will serve to make environmental impacts of power generation more distant from load centers in downstate New York. Impacts from the projects themselves are highly variable and may or may not be substantial. For example, visual impacts from aboveground projects like NYRI could be substantial. CHPEI, in contrast, is likely to be partially constructed underwater or underground along existing waterways and transportation right-of-ways, which should help to reduce effects, but its construction may have short-term impacts on aquatic ecology or affect traffic in the transportation corridors along which it will be installed.

Both of these projects are independent of any decision to grant or deny renewal of the IP2 and IP3 operating licenses, and are subject to other environmental review and regulatory processes over which NRC has no control. Transmission system construction and operation have their own environmental impacts, the specific nature and magnitude of which will vary depending on the length and location of the proposed route. For example, construction through wetland areas could entail significant ecological impacts, while construction through residential areas could entail significant aesthetic impacts. In the absence of any specific route information, NRC staff will not independently evaluate impacts of the transmission projects in this SEIS. They do, however, serve as meaningful illustrations of projects that may improve the availability of power from other regions of the State or Canada to reach the same end-use markets currently served by IP2 and IP3.

8.3.3 Conservation

In this section, the NRC staff evaluates conservation[4] as an alternative to license renewal.

[4] The NRC staff notes that conservation typically refers to all programs that reduce energy consumption, while energy efficiency refers to programs that reduce consumption without reducing services. For this section, some conservation measures considered by the NRC staff are also energy efficiency measures.

According to the American Council for an Energy-Efficient Economy (ACEEE) State Energy Efficiency Scorecard for 2006, New York ranks seventh in the country in terms of implementation of energy efficiency programs, suggesting that the State's conservation efforts are significant when compared to other States (ACEEE 2006). New York scored well (2 out of 3) on tax incentives and appliance standards. The State scored low on energy efficiency resource standards (0 out of 5) and utilities' per-capita spending on energy efficiency (5 out of 15), suggesting there is room for improvement in these areas.

The IP2 and IP3 ER (Energy 2007) dismissed conservation as a replacement alternative for IP2 and IP3 because conservation does not meet the criterion of a "single, discrete source." Also, because Entergy is a generator of electricity and not a distributor, it indicated that it does not have the ability to implement regionwide conservation programs (Entergy 2007). However, because of efforts made by the State of New York and comments received during preparation of this SEIS, the NRC staff examines conservation in this SEIS as an alternative to replace at least part of the output of IP2 and IP3.

The New York State Energy Research and Development Authority (NYSERDA) is pursuing initiatives in conservation. Within NYSERDA, the Energy Efficiency Services Program and Residential Efficiency and Affordability Program deploy programs and services to promote energy efficiency and smart energy choices (NYSERDA 2007). According to the NYSERDA, implementation of conservation in the following program areas has resulted in significant energy savings:

- existing buildings and structures
- new buildings and structures
- market/workforce development
- distributed generation and renewables
- industrial process
- transportation

In 2006, the National Research Council's Committee on Alternatives to Indian Point for Meeting Energy Needs developed a report that specifically addressed alternatives to IP2 and IP3 for meeting Statewide power needs (National Research Council 2006). The document reports that in 2005, NYSERDA estimated that its energy efficiency programs had reduced peak energy demands in New York by 860 MW(e). NYSERDA further forecasted that the technical potential of its efficiency programs in New York would result in a cumulative 3800 MW(e)-reduction of peak load by 2012 and 7400 MW(e) by 2022 (National Research Council 2006). "Technical potential" refers to the complete deployment of all applications that are technically feasible.

In addition to the currently anticipated peak load reductions resulting from the NYSERDA energy efficiency initiatives, additional conservation measures and demand-side investments in energy efficiency, demand response, and combined heat and power facilities could significantly offset peak demand Statewide. The National Resource Council estimated that peak demand could be reduced by 1000 MW(e) or more by 2010 and 1500 MW(e) by 2015 (National Research Council 2006).

The National Research Council estimates that economic potential peak demand in the IP2 and

IP3 service area could be expanded by approximately 200 MW(e) by 2010 and 300 MW(e) by 2015 assuming a doubling of the program budgets (National Research Council 2006). "Economic potential" is defined as that portion of the technical potential that the National Research Council judged to be cost effective. This estimate is based partly on the experience with three NYSERDA programs that avoided the need for 715 MW(e) of Statewide peak demand in 2004. Cost-effectiveness is based on a conservation option's ability to lower energy costs (consumers' bills) while energy prices continue to increase using EIA price forecasts. The National Research Council concludes that energy efficiency and demand-side management have great economic potential and could replace at least 800 MW(e) of the energy produced by IP2 and IP3 and possibly much more (National Research Council 2006).

More recently, New York State launched its Energy Efficiency Portfolio Standard program, calling for a 15 percent reduction in energy usage by 2015 compared to forecast levels (sometimes referred to as "15 by 15", and later combined with an augmented renewable portfolio standard in the 45 by 15 plan). Between June 2009 and January 2010, the Public Service Commission approved 45 electric energy efficiency programs and 44 gas efficiency programs (NYSPSC 2010)

Given New York State's aggressive efforts in energy efficiency, as amplified by comments received on the draft SEIS, the NRC staff here considers an energy conservation/energy efficiency alternative, and will also include energy conservation in the combination alternatives.

Analyses in recent NRC license renewal SEISs (See NUREG-1437, Supplements 33 and 37, regarding Shearon Harris and Three Mile Island, Unit 1, respectively), indicate that all impacts from conservation are SMALL. The NRC staff adopts the analyses from those SEISs here, insofar as they identified all SMALL impacts from conservation as an alternative. The NRC staff also notes that loss of tax and PILOT revenue paid to municipalities near IP2 and IP3, as well as lost jobs, may result in SMALL to MODERATE socioeconomic impacts, which will not be offset by conservation.

8.3.4 Alternatives Dismissed from Individual Consideration

Other generation technologies the NRC staff considered but determined to be individually inadequate to serve as alternatives to IP2 and IP3 are discussed in the following paragraphs. The NRC staff has moved the supercritical coal-fired alternative to this section based on comments, a staff review of likely generating alternatives in New York State, and policies like the Regional Greenhouse Gas Initiative that make coal-fired generation unlikely in New York State. The discussion of the supercritical coal-fired alternative in this section has not been updated from the draft SEIS.

8.3.4.1 Wind Power

Studies conducted for the New York State Department of Public Service indicates that the total wind resource potential by 2015 is 8527 MW (NYSDPS 2009). This includes both onshore and offshore resources. offshore wind resources. Wind currently accounts for approximately 1275 MW(e), statewide (NYISO 2010). The NYSIO is managing wind generation projects that are proceeding through the grid interconnection process. These projects have a potential of

generating almost 7000 MW(e) if all are completed (NYISO 2010). NYISO indicates approximately 10% capacity credit, or 124 MW(e) for the 1275 MW(e) of existing wind power based on availability of the resource. Thus, 7000 additional MW(e) of wind capacity would be credited for less than 700 MW(e) of firm capacity(NRC staff further discusses this issue in the combination alternatives later in this chapter).

Generally, wind power, by itself, is not suitable for large baseload capacity. As discussed in Section 8.2.1 of the GEIS, wind has a high degree of intermittency, and average annual capacity factors for wind facilities are relatively low (on the order of 30 to 40 percent). Wind power, in conjunction with energy storage mechanisms or other readily dispatchable power sources like hydropower, might serve as a means of providing baseload power. However, current energy storage technologies are too expensive to allow wind power to serve as a large baseload generator.

Areas of class 3 or higher wind energy potential occur throughout much of the northeastern United States (DOE 1986, 2008). The primary areas of good wind energy resources are the Atlantic coast, the Great Lakes, and exposed hilltops, ridge crests, and mountain summits. Winter is the season of maximum wind power throughout the Northeast when all except the most sheltered areas have class 3 or better wind resource; exposed coastal areas and mountain summits can expect class 6 or 7 wind resource. In summer, the season of minimum wind power, class 3 wind resource can be found only on the outer coastal areas and highest mountain summits (DOE 1986).

Wind power of class 3 and higher is estimated for the high elevations of the Adirondack Mountains of northeastern New York (DOE 1986, 2008). Annual average wind power of class 3 or 4 is found along the coastal areas of both Lake Erie and Lake Ontario, while class 5 winds are estimated to exist in the central part of both lakes (DOE 1986, 2008).

The National Research Council estimated that offshore wind could meet most of the IP2 and IP3 load by 2014 (National Research Council 2006).

Given the difficulties inherent in relying on wind power as a baseload alternative, the NRC staff does not consider wind power to be a suitable stand-alone alternative, though the staff recognizes New York's utility-scale wind resources and active wind resource development. Therefore, the NRC staff includes wind power in the combination alternatives addressed in Section 8.3.5 of this SEIS.

8.3.4.2 Wood and Wood Waste

Wood-burning electric generating facilities can provide baseload power. However, the economic feasibility of a wood-burning facility is highly dependent on the availability of fuel sources and the location of the generating facility. Most wood-fired and other biomass plants are independent power producers and cogenerating stations with capacities on the order of 10 to 25 MW(e), with some plants operating in the 40 to 50 MW(e) range. In the 2007 New York Renewable Electricity Profile (DOE/EIA 2009), New York's power industry reported only 37 MW(e) of generating capacity for wood or wood waste derived power. Power generated by burning wood waste qualifies as renewable under New York's Renewable Portfolio Standard.

Wood-burning energy generation continues to be developed in the northeastern U.S. In 2005, about 16 percent of the nation's energy derived from wood and wood wastes was generated in the New England and Middle Atlantic census divisions (DOE/EIA 2007). Within the region,

about 12 percent of this generating capacity is from wood and wood wastes.

Walsh et al estimated New York's wood resources in a study published in 1999 (Walsh et al 1999). The study presents the amount of resources available in tons per year given a specified price per dry ton delivered. Wood feedstock categories included forest residues, defined as "logging residues; rough, rotten, and salvable dead wood; excess saplings; and small pole trees," and primary mill residues (Walsh 1999). The annual resources available for each of these categories at a delivery cost of less than $50 per dry ton are 1,746,400 and 1,274,000 tons, respectively (Walsh 1999). These volumes, respectively, account for about 4 percent and 1.5 percent of the total resource available in the 48 contiguous States. The neighboring States of New Jersey, Connecticut, Massachusetts, and Vermont have significantly less wood resource. Pennsylvania, however, has comparable resources to New York available. Assumptions in the analysis include transportation distances of less than 50 mi and accessibility of 50 percent of the forest residues from existing roads.

The NRC staff finds that New York has utility-scale wood waste resources, but given uncertainties in supply estimates, as well as the small size and high number of installed facilities necessary to replace IP2 and IP3, the NRC staff does not find wood biomass to be a suitable alternative to IP2 and IP3 operating license renewals. The NRC staff will include wood waste facilities as a contributor to biomass generating capacity in combinations of alternatives addressed in Section 8.3.5 of this SEIS.

8.3.4.3 Hydropower

New York State receives an abundant supply of hydroelectric power from Niagara Falls and other sites. Hydropower accounts for 5990 MW(e)—or about 15 percent—of the State's generating capacity (NYISO 2008).

Studies conducted for the New York State Department of Public Service indicate a potential for 2527 MW of hydroelectric power by 2022 (NYSDPS 2009). NYSDPS estimates that 289 MW of hydropower will come online by 2015, based on Renewable Portfolio Standard supply curves. Though the likely potential by 2015 is too little to replace IP2 or IP3, it is sufficient for inclusion in combination alternatives.

8.3.4.4 Oil-Fired Generation

Oil accounts for about 8 percent of the generating capacity—or 3515 MW(e)—Statewide (NYISO 2008). EIA projects that oil-fired plants will account for very little new generation capacity in the United States during the next 20 years, and higher fuel prices will lead to a decrease in overall oil consumption for electricity generation (DOE/EIA 2007a).

EIA no longer addresses oil as a significant contributor to capacity additions (DOE/EIA 2010), as discussed in Section 8.3. The relatively high cost of oil—even prior to 2008's record high prices—had prompted a steady decline for use in electricity generation. The NRC staff has not evaluated oil-fired generation as an alternative to the renewal of the IP2 and IP3 operating licenses, though the NRC staff notes that oil may temporarily be burned in a gas-fired alternative should gas capacity become constrained during winter heating season.

8.3.4.5 Solar Power

New York has enacted demand-side policies aimed at encouraging the adoption of photovoltaic (PV) technology for residents and businesses. These policies had resulted in the installation of

more than 1.5 MW(e) of demand-side PV energy as of summer 2005 (National Research Council 2006). Through its Clean Energy Initiative, the Long Island Power Authority had issued rebates for PV systems totaling more than 2.63 MW(e) (National Research Council 2006). The National Research Council indicates that PV systems may be in the economic interests of New York customers because of high retail electricity rates and the falling prices of PV-generated electricity (National Research Council 2006).

The National Research Council reported that PV-generated electricity can provide high-value peak-time distributed generation power with minimal environmental emissions, and PV can contribute significantly to grid stability, reliability, and security (National Research Council 2006). Distributed generation refers to the production of electricity at or close to the point of use. Under an aggressive development scenario, the National Research Council estimates that 70 MW(e) of distributed PV could be installed in the NYCA by 2010 and 335 MW(e) by 2015. However, the National Research Council states that there would have to be "reductions in PV costs and a long-term commitment to expand New York's PV programs" in order to reach these goals (National Research Council 2006). Finally, the National Research Council considers most of the projected PV distributed generation as demand-side reductions in peak energy demands. Therefore, the energy-saving impacts of solar power are included in the conservation estimates described in Section 8.3.4 of this SEIS.

More recently, the NRC staff notes that new solar projects are moving forward in the State, including, for example, a proposed 32 MW(e) facility at Brookhaven National Laboratory and a 15 MW(e) facility (with potential to expand to 20 MW(e)) in Coxsackie. Additionally, the New York Power Authority has its own solicitation for 100 MW(e) of photovoltaic power. The New York State Department of Public Service projects that solar photovoltaics will contribute 52.57 MW(e) of capacity for the customer-sited tier of the State's Renewable Portfolio Standard by 2015 (NYSDPS 2009).

The NRC staff does not consider solar power to be a suitable stand-alone alternative to the renewal of the IP2 and IP3 operating licenses, and the capacities being added in New York State are relatively small. The NRC staff does, however, recognize that solar energy is an important component of the NYSERDA demand-side reductions in peak load demands from generating facilities, including IP2 and IP3, as well as a contributor to the Renewable Portfolio Standard. Solar power may contribute to the combination alternatives addressed in Section 8.3.5 of this SEIS as a part of the conservation-derived demand reductions (as described in Section 8.3.4), and may support other generation at peak times.

8.3.4.6 New Nuclear Generation

Given the expressed industry interest in new nuclear construction, the NRC staff has previously evaluated the construction of a new regional nuclear power plant as an alternative to license renewal in SEISs for other nuclear power plant license renewal requests.

Given the current combined license (COL) application schedule, the time needed to review an application, and the anticipated length of construction, the NRC staff does not consider the construction and operation of a new nuclear power plant specifically for the purpose of replacing IP2 and IP3 to be a feasible alternative to license renewal at this time.

8.3.4.7 Geothermal Energy

Geothermal plants are most likely to be sited where hydrothermal reservoirs are prevalent, such

as in the western continental United States, Alaska, and Hawaii. There are no feasible eastern locations for geothermal capacity to serve as an alternative to IP2 and IP3 (NRC 1996), and the New York Renewable Electricity Profile did not indicate any geothermal energy production in New York in 2007 (DOE/EIA 2009). As such, the NRC staff concludes that geothermal energy would not be a feasible alternative to renewal of the IP2 and IP3 operating licenses.

8.3.4.8 Municipal Solid Waste

According to the Integrated Waste Services Association (IWSA), fewer than 90 waste-to-energy plants are operating in the United States, generating approximately 2700 MW(e) of electricity or an average of approximately 30 MW(e) per plant (IWSA 2007). The existing net capacity in the region of IP2 and IP3 is 156 MW(e) generated by six plants, while the technical potential within the region is 1096 MW(e) by 2014 (National Research Council 2006). The 2014 estimate includes production from fuels containing municipal solid waste and construction and demolition wood (a portion likely to be at least partially captured in Walsh et al and referenced in the Wood Waste section of 8.3.4).

Estimates in the GEIS suggest that the overall level of construction impact from a waste-fired plant would be approximately the same as that for a coal-fired plant. Additionally, waste-fired plants have the same or greater operational impacts than coal-fired technologies (including impacts on the aquatic environment, air, and waste disposal). The initial capital costs for municipal solid waste plants are greater than for comparable steam turbine technology at coal facilities or at wood waste facilities because of the need for specialized waste separation and handling equipment.

The decision to burn municipal waste to generate energy (waste-to-energy) is usually driven by the need for an alternative to landfills rather than by energy considerations. The use of landfills as a waste disposal option is likely to increase in the near term; with energy prices increasing, however, it is possible that municipal waste combustion facilities may become attractive. Congress has included waste-to-energy in the Production Tax Credit legislation to encourage development of waste-to-energy and other renewable technologies (IWSA 2008).

Given the small average installed size of municipal solid waste plants, it would take about 70 plants to replace IP2 and IP3. Furthermore, NYSERDA estimates that the Statewide economically achievable potential for summer peak load from municipal solid-waste-derived energy by 2022, well into the relicensing period for IP2 and IP3, is only 190 MW(e) (NYSERDA 2003). Therefore, the NRC staff does not consider municipal solid waste combustion to be a feasible alternative to license renewal. Certain types of refuse-derived fuel, however, may qualify for inclusion in New York's Renewable Portfolio Standard (RPS) as biomass to the extent that they make use of renewable waste streams. Staff addresses biomass contributions as part of the combination alternatives.

8.3.4.9 Other Biomass Derived Fuels

In addition to wood and wood waste fuels, there are several other biomass fuels used for generating electricity. These include burning crops, converting crops to a liquid fuel such as ethanol, gasifying crops, and biogas. Additionally, the National Research Council identifies animal and avian "manure" and wastewater methane as biomass derived fuel sources. The National Research Council estimates that the NYCA has a potential capacity of 41 MW(e) from biogas by 2014 (National Research Council 2006). NYSERDA estimates that the Statewide economically achievable annual load from biomass-derived energy by 2022, well into the

relicensing period for IP2 and IP3, is 1.7 million MW(h) (NYSERDA 2003) or about 190 MW(e). In the period between 2005 and 2007, IP2 and IP3 produced more than 16 million MW(h) annually (Blake 2008). Furthermore, the New York Renewable Electricity Profile did not indicate any energy production in New York from biomass fuels other than wood and wood waste in 2007 (DOE/EIA 2009), which is considered above. For these reasons, the NRC staff concludes that power generation from biomass fuels alone does not offer a feasible alternative to the renewal of the IP2 and IP3 operating licenses. It will, however, be considered as a portion of a combination alternative grouped with wood waste. NRC staff notes that, under New York's RPS, certain other waste streams, which may include source-separated portions of municipal solid waste, may qualify as biomass. This is distinguished from municipal solid waste in that certain portions of a municipal solid waste stream that may qualify as biomass are segregated from other portions of the municipal solid waste stream prior to further treatment (e.g., gasification) or direct combustion.

8.3.4.10 Fuel Cells

Fuel cells work by oxidizing fuels without combustion and the accompanying environmental side effects. The only byproducts are heat, water, and, if the fuel is not pure hydrogen, CO_2. Hydrogen fuel can come from a variety of hydrocarbon resources by subjecting them to steam under pressure. Natural gas is typically used as the source of hydrogen.

The only current program that was identified as being initiated by one of the three major power providers in downstate New York is a program being conducted by the New York Power Authority that involves nine fuel cell installations totaling 2.4 MW(e) using waste gas produced from sewage plants (National Research Council 2006).

At the present time, fuel cells are not economically or technologically competitive with other alternatives for baseload electricity generation. NYSERDA estimates that the Statewide technical potential for annual supply from fuel cells by 2022 is more than 37 million MW(h); however, NYSERDA indicated that the economical potential for 2022 is zero (NYSERDA 2003). NYSERDA defines economic potential as "that amount of technical potential available at technology costs below the current projected costs of conventional electric generation that these resources would avoid." Therefore, while it may be possible to use a distributed array of fuel cells to provide an alternative to IP2 and IP3, it currently would be prohibitively costly to do so. Since fuel cells are not currently economically feasible on such a large scale, the NRC staff concludes that fuel cell-derived power is not a feasible alternative to the IP2 and IP3 license renewals.

8.3.4.11 Delayed Retirement

Plants scheduled for retirement are aging and have higher emissions than newer plants. Keeping older plants online may not be technically or economically achievable when emissions controls or necessary environmental mitigation measures are taken into account. Furthermore, given that the demand for electricity is increasing and, in the near term, planned new sources within the NYCA are just keeping pace with retirements, the NRC staff does not consider additional delays in the retirements of existing plants to be a feasible alternative to compensate for the loss of power from IP2 and IP3. In section 8.3.1, however, NRC staff contemplates the repowering of a shutdown or underutilized facility with a natural gas combined-cycle power plant.

8.3.4.12 Combined Heat and Power

In course of preparing this SEIS, the NRC staff has received comments indicating that it should consider combined heat and power (CHP) as an alternative to license renewal. In some cases, these suggestions have also included an indication of the potential that CHP could have, as well as the environmental advantages of CHP applications.

CHP facilities provide electrical power as well as heat (often in the form of steam) for use by nearby industries or buildings. CHP installations are commonly found on large industrial facilities or in urban centers where many buildings are near to one another. Modern CHP tends to be efficient, in that CHP systems make effective use of some heat that would be wasted by conventional electrical generation. CHP systems can be designed to produce relatively larger proportions of electrical power or heat depending on existing demands.

The NRC staff notes that the current IP2 and IP3 are only used to produce electrical power, and do not supply heat to any offsite users. Combined heat and power, then, fulfills a need not currently met by IP2 and IP3 and is not a direct alternative to IP2 and IP3 license renewal.

8.3.4.13 Supercritical Coal-Fired Generation

The NRC staff has moved the supercritical coal-fired alternative to this section based on public draft SEIS comments, a staff review of likely generating alternatives in New York State, and policies like the Regional Greenhouse Gas Initiative that all suggest that new coal-fired generation is unlikely in New York State. The discussion of the supercritical coal-fired alternative in this section has not been updated from the draft SEIS.

Supercritical coal-fired plants are similar to other coal burners except that they operate at higher temperatures and pressures, which allows for greater thermal efficiency. Supercritical coal-fired boilers are commercially proven and represent an increasing proportion of new coal-fired power plants. In evaluating the supercritical coal-fired alternative, the NRC staff assumed that a new plant located at an alternate site would use a closed-cycle cooling system.

Construction of a coal-fired plant at an alternate site may necessitate the acquisition of additional ROWs for new transmission lines and construction of new lines to transmit power. Transmission line and ROW length would vary with distance to suitable existing lines. In addition, construction at an alternate site may necessitate the construction of an appropriate railroad spur (or other transportation infrastructure) for coal and limestone (used in scrubbers to remove sulfur oxides) deliveries.

For purposes of this analysis, the NRC staff will rely on data published by EIA indicating that a new, scrubbed coal plant constructed in 2015 will operate at a heat rate of 8661 BTU per kilowatt hour (BTU/kWh) (DOE/EIA 2007b). (This reduces the level of emissions for this alternative when compared to the coal-fired alternative Entergy analyzed in the ER for IP2 and IP3 ER by approximately 15 percent for some impact areas).

Impacts of a coal-fired alternative evaluated by the NRC staff assume that the new plant would have a gross electrical capacity of 2200 MW(e). The NRC staff's analysis of the 2200-MW(e) coal-fired plant is based on the factors used to calculate the impacts of the plant that would replace the 2158 MW(e) of power produced by the IP2 and IP3 plants (Entergy 2007). Because up to 10 percent of gross generation may be consumed on site by the coal-fired plant (or its pollution control equipment), the NRC staff's evaluation of a 2200-MW(e) plant may actually slightly understate impacts from this alternative. This ensures, however, that impact levels for alternatives are not overstated when compared to the proposed action.

The NRC staff will present most impacts on an annualized basis. While the renewal period for the IP2 and IP3 operating licenses is only 20 years, the operating lifespan for a new coal-fired plant is likely closer to 40 years, and may even be longer given the lifespans of some existing coal-fired plants. Most impacts will be independent of plant lifespan, though total land area used for waste disposal, for example, will be larger after 40 years than after 20 years. Where these differences exist, the NRC staff will identify them.

For replacing IP2 and IP3, the NRC evaluated an alternative that would use four 550-MW(e)-net coal-fired units to replace the power output of IP2 and IP3. Advanced coal and conventional combined-cycle coal plants could operate at even greater efficiencies (about 7477 and 6866 BTU/kWh, respectively, or greater) by 2015 (DOE/EIA 2007b).

The supercritical coal-fired plant, with a gross output of about 2200 MW(e), would consume approximately 4.9 million metric tons (MT) (5.4 million tons) per year of pulverized bituminous coal with an ash content of approximately 7.11 percent and sulfur content of 1.12 percent (based on New York coal consumption) (DOE/EIA 2001). The NRC staff assumed a capacity factor of 0.85 for the supercritical coal-fired alternative.

Based on Table 8-1 of the GEIS, a pulverized coal-fired facility requires approximately 0.7 ha (1.7 ac) of land per MW of generating capacity. Based on this relationship, a 1540-ha (3805-ac) site would be needed to replace the nuclear power output of IP2 and IP3 with an equivalent capacity coal-fired facility. In more recent SEIS documents, however, the NRC staff indicated that smaller quantities of land may be sufficient to construct coal-fired facilities based on land use at existing coal-fired power plants. Because the existing IP2 and IP3 site includes only 239 ac (97 ha), and much of the area is occupied by plant structures, the NRC staff concludes that there is not sufficient land area at the IP2 and IP3 site to support operations of the alternative. Thus, the coal-fired alternative is analyzed only for an unspecified alternate site. It should be noted that several of the newer coal utilization technologies (e.g., coal-fired integrated gasification combined-cycle systems) could be accommodated on smaller sites than would the conventional pulverized coal concept evaluated here, but likely not a site as small as the IP2 and IP3 site.

The overall impacts of the coal-fired generating facility are discussed in the following sections and summarized in Table 8-3, at the end of Section 8.3.1 of this SEIS. The implications of constructing a new coal-fired plant at an alternate site will depend on the actual location and characteristics of that site. For purposes of this section, the NRC staff assumes that a coal-fired plant located at an alternate site would require the construction of a new transmission line to connect that plant to the regional transmission grid.

Land Use

In the GEIS, the NRC staff estimated that about 0.7 ha (1.7 ac) of land are needed per MW(e) for the construction and operation of a coal-fired power plant. Constructing a 2200-MW(e) coal-fired facility would take approximately 1540 ha (3805 ac). In more recent SEIS documents, the NRC staff indicated that smaller quantities of land may be sufficient to construct coal-fired facilities based on land use at existing coal-fired power plants. A 2200-MW(e) facility may be able to fit on a site with several hundred acres of land rather than the 1540 ha (3805ac) indicated in the GEIS.

Committing land resources to a new coal-fired plant could result in the loss of wildlife habitat or

agricultural land. The potential need for new transmission line corridors and ROWs also drive land use effects for the coal-fired facility. As a result of the substantial site area that would be dedicated to and disrupted by coal-fired operations, the NRC staff views this alternative as having potentially MODERATE land use impacts from construction.

Additionally, for the coal-fired alternative, land use changes would occur at an undetermined coal mining area where approximately 75 square miles (sq mi) (19,400 ha) would be affected for mining coal and disposing of mining wastes to support a 2200-MW(e) coal-fired power plant (the GEIS estimates that approximately 34 sq mi (8800 ha) would be disturbed for a 1000-MW(e) coal-fired plant (NRC 1996). Offsite land use for coal mining would partially be offset by the elimination of the need for offsite uranium mining. In the GEIS, the NRC staff estimated that approximately 405 ha (1000 ac) would be affected for mining the uranium and processing it during the operating life of a 1000-MW(e) nuclear power plant (NRC 1996). Therefore the uranium mining offset for a 2200-MW(e) facility would be approximately 890 ha (2,200 ac) of the 19,400 ha required for the coal-fired alternative, resulting in a net requirement of approximately 18,500 ha (45,700 ac). Impacts from the coal fuel cycle would add to the already MODERATE impacts from plant construction.

A coal-fired alternative would likely receive coal and limestone by rail. The coal-fired option would require approximately 10.4 coal unit trains per week (assuming each train has 100 cars with 100 tons of coal per car). For an undeveloped site, a new rail spur would be necessary. For an existing industrial site, a rail spur may exist but could require improvements to handle these deliveries. Impacts from improving an existing rail spur would be small, as the area is already disturbed and used for industrial purposes. Installing a new rail spur could result in relatively minor impacts depending on the length of the rail spur.

Overall, impacts to land use from construction of the coal-fired alternative and its fuel cycle would be MODERATE to LARGE.

Ecology

Siting a coal-fired plant at an alternate site would introduce construction and operating impacts. Converting as much as 1500 ha (3700 ac) of land to industrial use (generating facilities, coal storage, ash and scrubber sludge disposal) could significantly alter terrestrial ecological resources and could affect aquatic ecological resources. Construction and maintenance of a transmission line and rail spur would incrementally add to the terrestrial ecological impacts. Impacts to terrestrial ecology from coal mining also could be substantial, though terrestrial ecology at many coal mining sites has already been disturbed. Therefore, the NRC staff concludes that the impact to terrestrial ecology would be MODERATE to LARGE, depending largely on the ecological sensitivity of the plant and mine sites.

Use of surface water resources to provide makeup water for a closed-cycle cooling system would have some impact on local aquatic resources. Aquatic impacts of a supercritical coal-fired alternative would likely be similar to the impacts of the proposed closed-cycle cooling system proposed for the existing nuclear reactors described in Section 8.1.1 of this SEIS. The supercritical coal-fired power plant's greater thermal efficiency—when compared to the existing IP2 and IP3—would result in smaller impacts, while the coal-fired alternative has greater potential for deposition of pollutants or runoff from coal, ash, or scrubber waste areas. On the whole, the level of impact would be similar. Therefore, the NRC staff concludes that the impact to aquatic ecology would be SMALL.

Due primarily to the potential effects on terrestrial ecology, the NRC staff concludes that the overall impacts of this alternative would be MODERATE to LARGE.

Water Use and Quality

For coal-fired operations at an alternate site, impacts to surface waters would result from withdrawal of water for various operating needs of the facility. These operating needs would include cooling tower makeup and possibly auxiliary cooling for equipment and potable water requirements. Discharges to surface water could result from cooling tower blowdown, coal pile runoff, and runoff from coal ash and scrubber byproduct disposal areas. Both the use of surface waters and discharges to surface waters would be regulated by the State within which the coal-fired facility is located.

The NRC staff expects that any new coal-fired facility would comply with requirements of the discharge permits issued for its operation. Thus, the utility would be obligated to ensure that discharges from the plant conform to applicable water quality standards. Water withdrawals from a small river or cooling pond, however, could lead to potential water use conflicts. Overall, the NRC staff concludes that the potential impacts to surface water resources and water quality would be SMALL to MODERATE for a new coal-fired facility located at an alternate site.

Potential impacts to ground water quality at an alternate site may occur as a result of seepage to ground water from coal storage areas and onsite ash and scrubber sludge disposal areas. However, a coal-fired plant of this size is unlikely to use ground water for cooling tower makeup. In all cases, the NRC staff expects that a coal-fired facility would comply with a ground water use and discharge permit issued by the State having jurisdiction over the plant. Complying with permit requirements should ensure a small impact. Therefore, the NRC staff concludes that the potential impacts to water resources would be SMALL to MODERATE.

Air Quality

A coal-fired power plant emits a variety of airborne emissions, including SO_x, NO_x, particulate matter, carbon monoxide (CO), hazardous air pollutants (HAPs) (e.g., mercury), and naturally occurring radioactive materials.

A coal-fired alternative built in a nonattainment area (such as exists at the current IP2 and IP3 site) would require a nonattainment area permit and a Title V operating permit under the CAA. A new power plant would also be subject to the new source performance standards for such units in Subpart DA, "Standards of Performance for Electric Utility Steam Generating Units for Which Construction Is Commenced after September 18, 1978," of 40 CFR Part 60, "Standards of Performance for New Stationary Sources." These regulations establish emission limits for particulates, opacity, sulfur dioxide (SO_2), and NO_x. EPA has various regulatory requirements for visibility protection in Subpart P, "Protection of Visibility," of 40 CFR Part 51, "Requirements for Preparation, Adoption, and Submittal of Implementation Plans," including a specific requirement for review of any new major stationary source in an area designated attainment or unclassified under the CAA.

NRC discussions of SO_x and NO_x emissions include the most recent relevant regulations, because the Clean Air Interstate Rule (CAIR) was vacated by the D.C. Circuit Court in July of 2008. On September 24, 2008, EPA filed for a rehearing of the D.C. Circuit Court decision. Until EPA, Congress, or the courts act, elements of future SO_x and NO_x regulatory approaches

remain uncertain.

Emissions of specific pollutants from coal-fired alternatives are as follows:

Sulfur oxides emissions. The NRC staff calculates that a new coal-fired power plant would emit 5236 MT/yr (5767 tons/yr) of SO_x after limestone-based scrubbers remove approximately 99 percent of sulfur compounds from plant exhaust. This plant would be subject to the requirements in Title IV of the CAA. Title IV was enacted to reduce emissions of SO_x and NO_x, the two principal precursors of acid rain, by restricting emissions of these pollutants from power plants. Title IV caps aggregate annual power plant SO_x emissions and imposes controls on SO_x emissions through a system of marketable allowances. EPA issues one allowance for each ton of SO_x that a unit is allowed to emit.

New units do not receive allowances but are required to have allowances to cover their SO_x emissions. Owners of new units must, therefore, acquire allowances from owners of other power plants or reduce SO_x emissions at other power plants they own. Allowances can be banked for use in future years. Thus, a new coal-fired power plant would not add to net regional SO_x emissions, although it might contribute to the local SO_x burden.

Nitrogen oxides emissions. Title IV of the CAA directed EPA to establish technology-based emission limitations for NO_x emissions (see Section 407), rather than a market-based allowance system as is used for SO_x emissions. A new coal-fired power plant would be subject to the new source performance standards for such plants in 40 CFR 60.44a(d)(1). That regulation, issued September 16, 1998 (Volume 63, page 49453 of the *Federal Register* (63 FR 49453)), limits the discharge of any gases that contain nitrogen oxides (expressed as nitrogen dioxide (NO_2)) to 200 nanograms per joule of gross energy output (1.6 pound/megawatt-hour (MW(h)), based on a 30-day rolling average.

As previously discussed, IP2 and IP3 are located within the New Jersey-New York-Connecticut Interstate Air Quality Control Region (40 CFR 81.13). All of the States of New Jersey and Connecticut, as well as several counties in Central and Southeastern New York within a 80-km (50-mi) radius of IP2 and IP3, are designated as nonattainment areas for ozone (8-hour standard) (EPA 2008b). Operators or owners of a coal-fired power plant constructed in a nonattainment area would need to purchase offsets for ozone precursor emissions. In this case, NO_x is the major ozone precursor emitted by a coal-fired power plant. In accordance with NYSDEC regulations, "Emission offsets must exceed the net increase in annual actual emissions from the air contamination source project" (NYSDEC, Chapter 3, Parts 231–15). By design, this regulatory requirement should result in a net reduction in ozone emissions in the region.

This new coal-fired plant would likely use a variety of NO_x control technologies, including low-NO_x burners, overfire air, and selective catalytic reduction. EPA notes that when these emissions controls are used in concert, they can reduce NO_x emissions by up to 95 percent (EPA 1998), for total annual emissions of approximately 1230 MT/yr (1355 tons/yr) or 0.14 pounds/MW(h). This is significantly less than the amount allowed by Title IV of the CAA.

Particulate emissions. The NRC staff estimates that the total annual stack emissions would include 175 MT (192 tons) of total suspended particulates and 40 MT (44 tons) of particulate matter having an aerodynamic diameter less than or equal to 10 μm (PM_{10}) (40 CFR 50.6, "National Primary and Secondary Ambient Air Quality Standards for PM_{10}"). Some of this PM_{10} would also be classified as primary $PM_{2.5}$.

As indicated in the IP2 and IP3 ER, fabric filters or electrostatic precipitators would be used for particulate control. EPA notes that filters or precipitators are each capable of removing more than 99 percent of particulate matter, and that SO_2 scrubbers further reduce particulate matter emissions (EPA 1998). In addition to flue emissions, coal-handling equipment would introduce fugitive particulate emissions from coal piles, reclamation equipment, conveyors, and other sources.

Fugitive dust also would be generated during the construction of a coal-fired plant, and construction vehicles and motorized equipment would further contribute to construction-phase air emissions. These emissions would be short lived and intermittent, and construction crews would likely mitigate some impacts through dust control measures.

Carbon monoxide emissions. The NRC staff estimates that the total CO emissions from coal combustion would be approximately 1230 MT/yr (1354 tons/yr) based on EPA-calculated emissions factors for coal-fired power plants.

Hazardous air pollutants including mercury. Following the D.C. Circuit Court's February 8, 2008, ruling that vacated its Clean Air Mercury Rule (CAMR), EPA is working to evaluate how the court's ruling will affect mercury regulation (EPA 2008d). Before CAMR, EPA determined that coal- and oil-fired electric utility steam-generating units are significant emitters of HAPs (EPA 2000a). EPA determined that coal plants emit arsenic, beryllium, cadmium, chromium, dioxins, hydrogen chloride, hydrogen fluoride, lead, manganese, and mercury (EPA 2000a). EPA concluded that mercury is the HAP of greatest concern and that (1) a link exists between coal combustion and mercury emissions, (2) electric utility steam-generating units are the largest domestic source of mercury emissions, and (3) certain segments of the U.S population (e.g., the developing fetus and subsistence fish-eating populations) are believed to be at potential risk of adverse health effects resulting from mercury exposures caused by the consumption of contaminated fish (EPA 2000a). In light of the recent court decision, EPA will revisit mercury regulation, although it is possible that the agency will continue to regulate mercury as a HAP, thus requiring the use of best available control technology to prevent its release to the environment.

Uranium and thorium. Coal contains uranium and thorium, among other naturally occurring elements. According to Alex Gabbard of Oak Ridge National Laboratory, uranium concentrations are generally in the range of 1 to 10 parts per million (ppm), and thorium concentrations are generally about 2.5 times this level (Gabbard 1993). The U.S. Geological Survey (USGS) indicates that Western and Illinois Basin coals contain uranium and thorium at roughly equal concentrations, mostly between 1 and 4 ppm, but also indicates that some coals may contain concentrations of both elements as high as 20 ppm (USGS 1997). Gabbard indicates that a 1000-MW(e) coal-fired plant could release roughly 4.7 MT (5.2 tons) of uranium and 11.6 MT (12.8 tons) of thorium to the atmosphere each year (Gabbard 1993).

Both USGS and Gabbard, however, indicate that almost all of the uranium, thorium, and most decay products remain in solid coal wastes, especially in the fine glass spheres that constitute much of coal's fly ash. Modern emissions controls, such as those included for this coal-fired alternative, allow for recovery of greater than 99 percent of these solid wastes (EPA 1998), thus retaining most of coal's radioactive elements in solid form rather than releasing it to the atmosphere. Even after concentration in coal waste, the level of radioactive elements remains relatively low—typically 10 to 100 ppm—and consistent with levels found in naturally occurring

granite rocks, shales, and phosphate rocks (USGS 1997). The levels of uranium and thorium contained in coal wastes and discharged to the environment exceed the levels of uranium and thorium released to the environment by IP2 and IP3.

Carbon dioxide: A coal-fired plant would have unregulated CO_2 emissions that could contribute to global warming. Under the current regulatory framework, a coal-fired plant would have unregulated CO_2 emissions during operations as well as during coal mining and processing, and coal and lime transportation. Burning bituminous coal in the United States emits roughly 93.3 kg (205.3 pounds) of CO_2 per million BTU (DOE/EIA 2008a). The four-unit 2200-MW(e) supercritical coal-fired plant would emit approximately 13.1 million MT (14.4 million tons) of CO_2 per year assuming a heat rate of 8661 BTU/kWh (DOE/EIA 2007b). Section 6.2 of this SEIS contains a discussion of current and likely future relative greenhouse gas (GHG) emissions from several energy alternatives, including coal, natural gas, nuclear, and renewables. In Section 6.2, the NRC staff found that GHG emissions from coal would likely exceed those from other energy alternatives throughout the period of extended operation.

Visibility Regulations: Section 169A of the CAA (42 USC 7491) establishes a national goal of preventing future and remedying existing impairment of visibility in mandatory Class I Federal areas when impairment results from manmade air pollution. EPA issued a new regional haze rule in 1999 (64 FR 35714). The rule specifies that for each mandatory Class I Federal area located within a State, the State must establish goals that provide for reasonable progress towards achieving natural visibility conditions. The reasonable progress goals must provide for an improvement in visibility for the most-impaired days over the period of the implementation plan and ensure no degradation in visibility for the least-impaired days over the same period (40 CFR 51.308(d)(1)). If a coal-fired alternative were located close to a mandatory Class I area, additional air pollution control requirements would be imposed. New York has no Class I areas; of the neighboring States, New Jersey and Vermont each have one—the Brigantine Wilderness Area and the Lye Brook Wilderness, respectively. Brigantine is located about 225 km (140 mi) south of IP2 and IP3, while Lye Brook is roughly 215 km (134 mi) north-northeast. A coal-fired alternative located near these areas or any other Class I area may need additional pollution controls to keep from impairing visibility.

Summary. The GEIS analysis did not quantify emissions from coal-fired power plants, but implied that air impacts would be substantial. The GEIS also mentioned global warming from unregulated CO_2 emissions and acid rain from SO_x and NO_x emissions as potential impacts (NRC 1996). The NRC staff's analysis shows that emissions of air pollutants, including SO_x, NO_x, and CO, would be significant and would be greater than all other alternatives. Operational emissions of CO_2 are also greater under the coal-fired alternative than under any other alternative.

The NRC analysis for a coal-fired alternative at an alternative site indicates that impacts from the coal-fired alternative would have clearly noticeable effects, but given existing regulatory regimes, permit requirements, and emissions controls, the coal-fired alternative would not destabilize air quality. Thus, the appropriate characterization of air impacts from coal-fired generation would be MODERATE.

Waste

A four-unit, 2220-MW(e) coal-fired plant with a heat rate of 8661 BTU/kWh (DOE/EIA 2007b) would annually consume approximately 5.4 million tons of coal having an ash content of

7.11 percent (Entergy 2007). After combustion, 99.9 percent of this ash, approximately 348,600 MT (384,000 tons) per year, would be collected and disposed of at either an onsite or offsite landfill, or recycled. Based on industry-average recycling rates, approximately 155,610 MT (171,000 tons), or 45 percent, of the ash content would be recycled, leaving a total of approximately 192,290 MT (209,000 tons) for disposal (ACAA 2007). In addition, approximately 300,300 MT (330,000 tons) of scrubber waste would be disposed of or recycled each year. Based on industry-average recycling rates, approximately 237,000 MT (261,000), or 79 percent, of gypsum scrubber waste would be recycled (ACAA 2007). As mentioned in the Air Quality section, this waste also would contain levels of uranium and thorium in concentrations similar to those found in naturally occurring granites, shales, and phosphate rocks (USGS 1997). In addition to coal combustion wastes, a supercritical coal-fired alternative also would produce small amounts of domestic and hazardous wastes.

Disposal of the waste could noticeably affect land use and ground water quality, but with appropriate management and monitoring, it would not destabilize any resources. After closure of the waste site and revegetation, the land could be available for other uses.

In May 2000, EPA issued a "Notice of Regulatory Determination on Wastes from the Combustion of Fossil Fuels" (EPA 2000b). EPA concluded that some form of national regulation is warranted to address coal combustion waste products because (1) the composition of these wastes could present danger to human health and the environment under certain conditions, (2) EPA has identified 11 documented cases of proven damages to human health and the environment by improper management of these wastes in landfills and surface impoundments, (3) disposal practices are such that, in 1995, these wastes were being managed in 40 to 70 percent of landfills and surface impoundments without reasonable controls in place, particularly in the area of ground water monitoring, and (4) EPA identified gaps in State oversight of coal combustion wastes. Accordingly, EPA announced its intention to issue regulations for disposal of coal combustion waste under Subtitle D of the Resource Conservation and Recovery Act (RCRA). EPA has not yet issued these regulations.

In addition to the waste streams generated during plant operations, considerable debris would be generated during construction of a coal-fired facility. Crews would likely dispose of land-clearing debris on site.

For all of the preceding reasons, the NRC staff considers the impacts of managing waste generated by a coal facility (construction and operating phases) to be MODERATE—the impacts would be clearly noticeable, but would likely not destabilize any important resource.

Human Health

Coal-fired power generation introduces risks to workers at many points in the fuel cycle. These risks include risks from mining coal and limestone, transportation of raw materials, plant construction and operation, and waste management. There also may be public health risks from a coal-fired plant's operation (routine emissions and coal-pile fires) and fuel cycle (mining and transportation).

During construction activities there would be risk to workers from typical industrial incidents and accidents. Accidental injuries are not uncommon in the construction industry and accidents resulting in fatalities do occur. However, the occurrence of such events is mitigated by the use of proper industrial hygiene practices, complying with worker safety requirements, and training.

Occupational and public health impacts during construction are expected to be controlled by continued application of accepted industrial hygiene protocols, occupational health and safety controls, and radiation protection practices.

In the GEIS, the NRC staff stated that human health impacts (cancer and emphysema) could arise from chronic exposures to coal-fired plant emissions. Emissions contain pollutants such as toxins, particulates, and low levels of naturally occurring radioactive elements. However, Federal and/or State agencies regulate these emissions and enforce emissions standards that are designed to be protective of human health. As a result, power plants install appropriate emission controls to meet regulatory standards.

Coal-fired generation would introduce mechanical sources of noise that would be audible off site. Sources contributing to total noise produced by plant operations are both continuous and intermittent. Continuous sources include the mechanical equipment associated with normal plant operations. Intermittent sources include the coal-handling equipment, solid-waste disposal systems, outside loudspeakers, and commuting activities of plant employees. Noise impacts associated with rail delivery of coal and lime to the generating station site would be most significant for residents living along the new rail spur leading to the plant. Although passing trains significantly raise noise levels near rail corridors, the short duration of the noise tends to minimize impacts.

Based on the cumulative potential impacts of construction activities, emissions, and noise on human health, the NRC staff considers the impact of constructing and operating a new coal-fired facility to be MODERATE.

Socioeconomics

Construction of a coal-fired facility at an alternate site would take approximately 4 years (DOE/EIA 2007b). Based on estimates given in Table 8.1 of the GEIS, the peak workforce is estimated to range from 1.2 to 2.5 additional workers per MW(e) during the construction period. For the 2200-MW(e) plant utilized in this analysis, the peak workforce would range from approximately 2640 to as many as 5500 workers during the 4-year construction period (NRC 1996). During construction, the surrounding communities would experience demands on housing and public services unless some of the workforce is composed of local residents. In the GEIS, the NRC staff stated that socioeconomic impacts would depend on the location of the new plant. For example, at a rural site more of the peak construction workforce would need to relocate (temporarily or permanently) to the area to work. Therefore, socioeconomic impacts could range from SMALL to LARGE depending on whether workers would relocate to be near the site, as well as depending on the size and makeup of the existing community.

At the end of construction, the local population would be affected by the loss of as many as 5000 construction jobs. However, this loss would be partially offset by a postconstruction permanent employment rate of 0.25 workers per MW(e) based on Table 8.2 of the GEIS, or a total of 550 total workers. An additional construction workforce would be needed for the decommissioning of IP2 and IP3 which could temporarily offset the impacts of the lost construction and IP2 and IP3 jobs at the site.

The coal-fired plant would provide new tax revenue to its community. Because this plant would be located in another community, it would have a positive impact on its community while the shutdown of IP2 and IP3 will have a negative impact on the tax base of the IP2 and IP3

community.

The NRC staff concludes that the overall socioeconomic impacts of changes in the local population from the influx of the construction workforce and changes to community tax revenues could be SMALL to LARGE during construction and SMALL to MODERATE during operation, depending on the size and economic structure of the affected communities.

Transportation

During the 4-year construction period of the coal-fired unit, as many as 2640 to 5500 construction workers may be working at the site. During this same time period, trucks and trains would likely be delivering construction materials to the site. The addition of these workers would increase traffic on highways and local roads that lead to the construction site. The impact of this additional traffic could have a MODERATE to LARGE impact on nearby roadways, particularly if the alternate site is in a rural area. Impacts associated with plant operating personnel commuting to work are likely to be SMALL.

For rail transportation of coal and limestone to the alternate site, impacts are likely to range from SMALL to LARGE, depending on local rail characteristics. On average, more than ten 100-car trains per week would deliver coal to the new generating station, and two 10-car trains per week would deliver limestone to the facility. Transportation impacts associated with coal and limestone delivery could range from SMALL to LARGE

Overall, transportation impacts could range from MODERATE to LARGE during construction, and SMALL to LARGE during operation.

Aesthetics

At an alternate site, plant buildings, exhaust stacks, cooling towers, and cooling tower plumes would create aesthetic impacts. The coal-fired alternative's four power plant units would be up to 200 ft (61 m) tall and may be visible off site in daylight hours. The three exhaust stacks could be up to 600 ft (183 m) high (at least 500 ft (152 m) for good engineering practice). If the coal-fired alternative makes use of natural-draft cooling towers, then additional visual impacts will occur from the towers, which may be several hundred feet tall and topped with condensate plumes. Mechanical-draft towers would also generate condensate plumes, but would be markedly shorter than natural-draft towers (or they may use hybrid towers like the alternative described in Section 8.1 of this SEIS). Other buildings on site may also affect aesthetics, as could construction of new transmission lines. Noise and light from plant operations, as well as lighting on plant structures, may be detectable off site.

Aesthetic impacts at the plant site would be minimized if the plant were located in an industrial area adjacent to other power plants or industrial facilities. Development of a new coal-fired facility at an undeveloped alternate site, however, would entail construction of a new transmission line and a new rail spur to bring coal and lime to the plant. The rail spur and transmission line could extend many miles from the site to tie-in points with existing rail and transmission systems. The visual intrusion of these two linear elements, particularly the transmission line, could be significant.

Overall the aesthetic impacts associated with locating at an alternate site would be categorized as MODERATE to LARGE for an undeveloped site, and may be SMALL to MODERATE at a site previously developed for industrial uses.

Historic and Archeological Resources

A cultural resource inventory would be needed for any property that has not been previously surveyed. The survey would include an inventory of field cultural resources, identification and recording of existing historic and archeological resources, and possible mitigation of adverse effects from subsequent ground-disturbing actions related to physical expansion of the plant site. The studies would likely be needed for all areas of potential disturbance at the proposed plant site and along associated corridors where new construction would occur (e.g., roads, transmission corridors, rail lines, or other ROWs).

Historic and archeological resource impacts can generally be effectively managed and, as such, would be considered SMALL to MODERATE at a new undeveloped site, depending on the sensitivity of the site. For a previously developed site, most of which have already been intensively developed, impact on cultural and historic resources would also be SMALL. Previous development would likely have either removed items of archeological interest or may have included a survey for sensitive resources. Any significant resources identified would have to be handled in accordance with the NHPA.

Environmental Justice

As described in Section 8.2 of this SEIS, no environmental impacts were identified that would result in disproportionately high and adverse environmental impacts on minority and low-income populations if IP2 and IP3 were shut down.

Impacts at the location of the new four-unit coal-fired plant would depend upon the site chosen and the nearby population distribution, but would likely be SMALL to MODERATE for most alternate sites, but could reach LARGE. For previously developed industrial sites, impacts could be larger or smaller, depending on the relative proximity of low-income populations.

8.3.5 Combinations of Alternatives

Even though many individual alternatives to license renewal might not be sufficient on their own to replace the 2158-MW(e) total capacity of the IP2 and IP3 units because of the lack of resource availability, technical maturity, or regulatory barriers, it is conceivable that a combination of alternatives might be sufficient. Such alternatives may also include the continued operation of either IP2 or IP3 combined with other alternatives.

There are many possible combinations of alternatives that could be considered to replace the power generated by IP2 and IP3. In the GEIS, NRC staff indicated that consideration of alternatives would be limited to single, discrete generating options, given the virtually unlimited number of combinations available. In this section, the NRC staff examines two possible combinations of alternatives, considering, among others, the work of Levitan and Associates (2005) and the National Research Council (2006) have all addressed combinations of alternatives. The National Research Council (2006) noted, for example, that ". . . the additional 2 gigawatts (GWs) required if IP2 and IP3 were to be closed could be met by some suitable combination of new generation in the New York City area, efficiency improvements and demand-side management, and new transmission capability from upstate." Information available since the publication of the draft SEIS provides additional insight into renewal energy capability and potential transmission options.

The NRC staff presents two possible combinations based partly on analysis by the National Research Council and in part on comments received on the draft SEIS. In one of these combinations, the NRC has included the continued operation of either IP2 or IP3. The second combination considers several alternatives as a complete replacement of IP2 and IP3. The second combination is based entirely on new generation, efficiency improvements or demand-side management (jointly addressed as conservation), and assumes the availability of transmission capacity to carry power from upstate. These combinations include several alternatives that the NRC staff found to be unsuitable for replacing the entirety of IP2 and IP3 electrical capacity. The NRC staff notes that an infinite number of potential combination alternatives exists, based on varying the amounts or types of power generation employed or varying the extent to which alternatives rely on energy conservation. It is not possible to consider all such combinations. Rather, the NRC staff selected the following alternatives based on available research and input from the draft SEIS comment process. They represent, in the staff's judgment, reasonable examples of combinations based upon comments received, ongoing State-level programs, and resource availability in New York State. The staff notes that none of these combinations are intended to place a limit on available resource capacities, nor are they intended to supplant State or utility level policy decisions about how to generate electricity, reduce or add to loads, set prices, or promote different approaches to generating electricity or managing loads.

Combination Alternative 1

- continued operation of either IP2 or IP3
- obtaining 600 MW(e) from renewable energy sources (primarily wind with smaller amounts of hydropower, biomass, and possibly landfill gas; assumes that sufficient hydropower, biomass, and landfill gas capacity exists to compensate for wind power intermittency)
- implementing 600 MW(e) of conservation programs based on the State's "15x15" energy conservation program and other efforts to improve energy efficiency or increase conservation

Combination Alternative 2

- repowering an existing fossil-powered plant in downstate New York with a new 400-MW(e) to 600 MW(e) combined-cycle power plant (the plant could also be located at the Indian Point site)
- obtaining 600 MW(e) from renewable energy sources (primarily wind, biomass, new hydropower, and landfill gas)
- implementing 1000 to 1200 MW(e) of conservation programs

The following sections analyze the impacts of the two combination alternatives outlined above. In some cases, detailed impact analyses for similar actions are described in previous sections of this Chapter. When this occurs, the impacts of the combined alternatives are discussed in a general manner with reference to other sections of this SEIS. A summary of the impacts from

the two combined alternative options is presented in Table 8-5.

8.3.5.1 Impacts of Combination Alternative 1

Each component of the first combination alternative produces different environmental impacts, though several of the options would have impacts similar to—but smaller than—alternatives already addressed in this SEIS. If NYSDEC requires cooling towers, then constructing closed-cycle cooling for one of the existing Indian Point generating units (either IP2 or IP3) would create impacts roughly equal to half of the impacts addressed in 8.1.1 (slightly larger impacts in land use and historical and archaeological resources if IP3 continues to operate as the Algonquin pipeline only needs to be rerouted for the IP3 proposed tower, and Entergy's Phase 1b study identified historic and archaeological resources near the IP3 tower site; potentially larger waste disposal or human health impacts for the IP2 tower as the potential for contaminated blasting spoils and groundwater is greater in that area). Continued operations of either IP2 or IP3 would incur roughly half the impacts of continued operations described in Chapters 3, 4, and 6. (Decommissioning impacts, as described in Chapter 7 of this SEIS, as well as NUREG-0586, would still occur but may occur later than they would if both units retired at the end of their current Operating Licenses.)

The NRC staff has not yet addressed in any depth in this SEIS the impacts of wind power or biomass generation. The New York State Department of Public Service, in late 2009, indicated that renewable generation resources developed under its Renewable Portfolio Standard by 2015 would likely be wind powered (NYSDPS 2009). In the years 2011 through 2015, NYSDPS expects 1076 MW of wind power to come online. Over the same period, it expects 303 MW of biomass (NYSDPS 2009) (including, among other fuel resources, source-separated waste and wood fuel; NYSPSC 2004), 289 MW of hydropower (from upstate New York and Canada), and 95 MW of landfill gas capacity (NYSDPS 2009). These potentials do not indicate an upper bound of the possible resources in the state, but are indicative of the resources most likely to be added based on NYSDPS supply curve projections. By 2015, then, new renewable resource additions could readily supply the 600 MW of renewable capacity considered here with sufficient biomass, hydropower, and landfill gas additions to back up wind power generation.

The wind power portion of this alternative could include onshore or offshore installations, and may include more than one location. Installations have been proposed for many locations around the state, both on- and offshore, and could include wind turbines off Long Island on the Atlantic coast (with easy access to downstate electricity demand), in upstate New York, or on Lake Erie or Lake Ontario. Multiple locations would also allow operators to hedge for poor wind conditions in any one location. A study conducted for NYSERDA (NYSERDA 2005) indicates that unforced capacity – the percentage of installed capacity available at any given time – at New York State wind installations is approximately 10% for onshore installations and 36% at offshore installations (the offshore estimate is based on one location near Long Island). Because wind power installations do not provide full power all the time, the total installed capacity would either need to exceed the capacity stated here or have sufficient backup generation. In this case, NRC staff assumes that other renewables (hydropower, biomass, and landfill gas) could function as a backup.

As noted in Section 8.3.4, under Wood Waste, the biomass alternative would have impacts similar to a coal-fired plant of similar capacity. Unlike a coal-fired plant, however, the biomass plant does not release heavy metals (including mercury, uranium, and thorium) in fly ash.

Biomass plants also tend to be slightly less efficient with slightly lower capacity factors than coal-fired facilities. The types of pollutants would be similar to that shown for the NGCC alternative, but in larger quantities for a given output. New York's RPS does not contemplate direct combustion of municipal solid waste as a qualifying resource (NYSPSC 2004), and thus the more-severe air effects of MSW combustion are not addressed here.

Impacts from conservation measures are likely to be negligible, as the NRC staff indicated in the GEIS (1996) and earlier in this chapter. The primary concerns NRC staff identified in the GEIS related to indoor air quality and waste disposal. In the GEIS, NRC staff indicated that air quality appeared to become an issue when weatherization initiatives exacerbated existing problems, and were expected not to present significant effects. The NRC staff also indicated that waste disposal concerns related to energy-saving measures like fluorescent lighting could be addressed by recycling programs. The NRC staff considers the overall impact from conservation to be SMALL in all resource areas, though measures that provide weatherization assistance to low-income populations may have positive effects on environmental justice.

- **Land Use**

Impacts from this alternative would include the types of impacts discussed for land use in Section 8.1.1.2 and Section 8.3.2.1 of this SEIS. Construction of two hybrid cooling towers would have a SMALL to LARGE impact on land use, depending on where Entergy disposes of excavated material, and construction of one tower would be expected to have approximately half of the impact. If the plant operator constructed only one new cooling tower for the remaining IP unit the land use impacts will also be SMALL to MODERATE, depending on where Entergy disposes of excavated material from the one cooling tower. If no cooling tower was constructed for the remaining unit, the land use impact would be SMALL.

The GEIS notes that gathering fuel for wood-fired plants (a type of biomass plant) can have significant environmental impacts. However, the NRC staff believes that the operation of the 303 MW(e) of biomass-fired generation projected by NYSDPS (NYSDPS 2009) would have minor impacts, especially if the plants were widely distributed and feedstocks were primarily preexisting waste streams. Construction impacts of the biomass plants on land use would be SMALL to MODERATE depending on plant cooling configurations and plant locations. These impacts would be minimized by locating plants on previously disturbed land near other industrial applications, including paper/pulp mills or other forest-product operations where fuels may be readily available. Landfill gas facilities would likely have few new land use impacts as they are typically constructed within or adjacent to existing landfills. New transmission capacity, as discussed in Section 8.3.2 of this SEIS, may be necessary to convey renewables to downstate loads, and could result in additional land use impacts, but staff assumes that adequate transmission will be available.

Impacts from the wind power portion of this alternative would depend largely on whether the wind facility is located onshore or offshore. Onshore wind facilities will incur greater land use impacts than offshore, simply because all towers and supporting infrastructure will be located on land. NRC observations indicate that onshore installations could require several thousand acres, though turbines and infrastructure would actually occupy only a small percentage of that land area. Total land disturbance (temporary and permanent) would be approximately 1 ha (2.5 ac) per MW (NREL 2009). Most of this area (70 percent) is disturbed temporarily during construction. The majority of both temporary and permanent disturbance is a result of roads to

support the project (NREL 2009). Land around wind installations could remain in use for activities like agriculture (a practice consistent with wind farm siting throughout the U.S.). For 600 MW of wind capacity, NRC staff estimates a total land disturbance of 600 ha (1482 ac), of which 180 ha (445 ac) would be disturbed for the duration of the project if the entire project were constructed on land. Offshore turbines would have much smaller land use impacts.

Impacts from hydropower contributions to this combination alternative would depend on the location and type of hydropower installation. Hydropower installations that rely on new impoundments may have substantial land use impacts. Hydropower projects that rely on run-of-river or in-stream generator approaches will have markedly lower impacts.

Overall, the NRC staff considers that the land use impacts from the first combination alternative would be SMALL to MODERATE.

- **Ecology**

As described in Section 8.1.1.2 of the SEIS, the construction of two hybrid cooling towers would have a SMALL impact on aquatic ecology and a SMALL impact on terrestrial ecology (Entergy noted in its comments – included in Appendix A of this SEIS – that constructing cooling towers may have an effect on the Indiana Bat; consultation with the U.S. Fish and Wildlife Service may be necessary in the event that one unit continued to operate and NYSDEC required closed-cycle cooling). Because the combined alternative would involve construction and operation of only one cooling tower, the NRC staff considered the resulting impacts from the construction and operation of a single cooling to be SMALL on both the aquatic and terrestrial ecology. (If the remaining IP unit were to continue operating with once-through cooling, the volume of water used would be cut in half, resulting in lower impingement and entrainment impacts, as well as smaller thermal effects. Such effects would not be eliminated, however, and it is reasonable to expect that they would likely be at least MODERATE for some species, though the NRC staff have not analyzed the specific level of impact for this option. Not constructing a cooling tower would mean a smaller terrestrial impact.)

Offsite construction and operation of biomass plants may have a SMALL to MODERATE impact on both aquatic and terrestrial ecology, depending heavily on the location of the plants.

The principal ecological impacts of an offshore wind farm would be to aquatic ecological resources. An onshore wind farm located in upstate New York would primarily affect terrestrial ecology, with up to 180 ha (445 ac) disturbed for the life of the project, though in many cases this land is already in use for agricultural purposes. Neither type of wind farm would be likely to destabilize ecological resources. Accordingly, a wind farm would have SMALL ecological impacts.

NRC staff expects little or no impact to ecology from landfill gas combustion apart from impacts that may be caused by construction on areas outside the landfill confines. Hydropower, however, may trigger additional ecological effects if substantial construction or the creation of new reservoirs are necessary. Some riparian habitats may be inundated along with some upland areas, depending on depth and area of a reservoir. Impoundments could also disrupt migration of fish species, reduce oxygen content, and disrupt water level patters. Run-of-river and in-stream hydropower generation would have relatively minor impacts.

The NRC staff concludes that substantial ecological impacts could occur during the construction phase but could be managed by choice of construction methods (e.g., avoiding particularly

sensitive habitats) and by avoiding hydropower options that require reservoirs.

Overall, the NRC staff considers that the ecological impacts, both aquatic and terrestrial, from this combination alternative could range from SMALL to LARGE. Selecting low-impact hydropower approaches and less-sensitive windpower locations would minimize impacts.

- **Water Use and Quality**

The primary water use and quality issues from this alternative would occur from the hydropower portion of this alternative. Impacts, however, depend on the location and type of hydropower facility, with in-stream or run-of-river facilities having lower impacts than facilities that block watercourses. For some installations, impacts would be SMALL, while for others, impacts may be greater.

While construction impacts could occur from a wind farm, particularly if located offshore, these impacts are likely to short lived. An offshore windfarm is unlikely to located immediately adjacent to any water users, though construction may increase turbidity. An onshore wind farm could create additional erosion during construction, as would biomass plants. Landfill gas facilities are likely to trigger little to no additional impacts as they are located on sites that are already developed and typically have controls on water runoff and groundwater infiltration (even if such measures were not working properly at a given landfill, the incremental effect of a landfill gas facility would likely be undetectable compared to the effects of a landfill In general, site management practices keep effects from these components to a small level.

During operations, only the biomass and landfill gas plants would require water for cooling. All of these installations would likely use closed-cycle cooling, however, and this would limit the effects on water resources. As the NRC staff indicated for the NGCC alternative, the landfill gas and wood-fired portions of this alternative are likely to rely on surface water for cooling (or, as is the case in some locations, treated sewage effluent).

Effects from the continued operation of one IP unit with closed-cycle cooling would be SMALL, as would continued operation of one unit with the existing cooling system.

The NRC staff considers impacts on water use and quality to be SMALL to LARGE for this combination alternative. Impacts would be SMALL if low-impact hydropower facilities are selected, and IP2 or IP3 operate with closed-cycle cooling.

- **Air Quality**

The first combined alternative will have some impact on air quality as a result of emissions from the biomass plants and the landfill gas facilities. The impacts are likely to be similar to the NGCC alternative considered in this chapter in terms of the type of emissions, though relatively higher on a per-unit-output basis. Based on DPS projections for renewable generation through 2015, NRC staff projects that roughly 60 percent of backup for the windpower portion of this alternative would come from biomass and landfill gas, and these portions would not operate at all times (combustion units provide support to the windpower power portion of this alternative). Hydropower would supply the remainder of the backup to the wind portion. Hydropower itself produces no direct emissions.

Given the relatively small size of backup combustion generation –less than 400 MW from biomass and landfill gas – the emissions levels are likely to be a fraction of those from the NGCC alternative considered in this chapter. Landfill gas units may require pre-treatment of

gas streams in order to avoid emitting toxic gases, though these units also convert methane – a potent greenhouse gas and frequent byproduct of anaerobic decomposition – into carbon dioxide, a less-potent greenhouse gas. Also, these combustion installations are likely to be spread out over several locations in multiple areas. These new facilities would require air permits similar to those discussed for the NGCC alternative, though it is possible that the combustion portions of this alternative may be located outside of non-attainment areas, and thus be subject to less-stringent regulations. Given that a number of areas of New York State are non-attainment areas for ozone, however, it is likely that combustion portions of this alternative would have to offset emissions of NO_x. Overall impacts of these portions of the combination alternative would be SMALL, given the reduced size of this generating source as compared to the NGCC alternative.

Section 8.1.1.2 of this SEIS describes the impacts on air quality from the construction and operation of two hybrid cooling towers to be SMALL to LARGE, depending on CAA compliance. For the construction and operation of a single tower, the impacts would likely be SMALL to MODERATE. The continued operation of one of the nuclear power units without a cooling tower would have SMALL impacts.

Overall, the NRC staff considers that the air quality impacts from the first combination alternative would be SMALL to MODERATE, depending on whether a cooling tower is required at the IP site.

- **Waste**

Constructing a wind farm, biomass generation, and landfill gas generation has the potential to create substantial amounts of waste, as could constructing one cooling tower on the IP site.). Construction impacts could range from SMALL to LARGE during construction depending on site characteristics and the extent to which wastes can be reused, recycled, or readily disposed of.

Operational wastes would come primarily from the biomass power plant. Most of the ash from burned wood waste could be recycled or reused. The waste contribution from the remaining IP2 or IP3 unit would be roughly half of the waste generated by the current plant. Operation of the landfill gas and biomass plants, in addition to generating relatively little waste, would likely reduce or reuse waste streams.

During operations, waste volumes would have only SMALL impacts, while construction stage impacts could range from SMALL to LARGE.

- **Human Health**

The primary health concerns under this option would be occupational health and safety risks during the construction of the new facilities, and excavation for the cooling tower, if necessary. As described in previous sections (NGCC alternative), if the risks are appropriately managed, the human health impacts from these or similar alternatives are SMALL. Impacts from emissions are uncertain, but considered SMALL as the plants would comply with the CAA health-informed standards and other relevant emissions regulations. Continued operation of one IP unit with the existing once-through cooling system would not change this assessment.

Therefore, the NRC staff concludes that the overall human health impact from the first combination alternative would be SMALL.

- **Socioeconomics**

This combination alternative involves the shutdown of either IP2 or IP3. As detailed in Section 8.2 of this SEIS, the socioeconomic impacts of shutting down the plants would be SMALL to MODERATE because of the loss of PILOT payments to local municipalities. Under this option, those payments would be expected to decrease but would not be completely eliminated. Some IP2 or IP3 jobs would be lost with closure of one unit. At the same time, this alternative would create jobs in other locations and also generate new revenues for other municipalities. Overall, the NRC staff concludes that the socioeconomic impacts from the first combined alternative would be SMALL.

- **Socioeconomics (Transportation)**

As described in Section 8.1.1.2 of this SEIS, the construction of two hybrid cooling towers could have up to a LARGE impact on transportation in the area around IP2 and IP3 during construction because of the large volume of rock and debris that would need to be transported off site. Approximately half as much excavated material will need to leave the IP2 and IP3 site under this combination alternative (if the IP unit continued to operate with once-through cooling, no excavated material would need to leave the site and transportation impacts would be eliminated). The other aspects of this alternative will create modest, but noticeable, transportation effects during construction. Given that the biomass facility, hydropower facility, landfill gas installations, and wind farm are likely not be located in the same place, construction-stage impacts are less intense than if they were part of one collocated facility. Construction for the wind-power portion of this alternative may have noticeable impacts while trucks, trains, or ships carry large components to the project sites, but the impacts are limited in duration. The hydropower portion of this alternative is not likely to create transportation impacts unless an impoundment blocked a waterway used for shipping. NRC staff considers this unlikely.

During operation, only the biomass facility is likely to create noticeable impacts on transportation (in gathering materials), and these may not affect any important aspects of local transportation. No other transportation impacts for this alternative are considered to be as severe. Overall, the impact from this combined alternative would likely be MODERATE.

- **Aesthetics**

As described in Section 8.1.1.2 of this SEIS, the construction of two hybrid cooling towers would have a MODERATE impact on aesthetics. Aesthetic impacts from one cooling tower may be slightly smaller, though it would likely still affect the scenic value of the Hudson Valley.

Aesthetic impacts would occur during construction and operation of an offshore wind installation and would depend on its distance from the shore and on its orientation in regard to shoreline communities. The NRC staff estimates that the construction and operational impacts of the facility could be managed, though some may consider the impact to be LARGE, depending on the location of the turbines. An onshore wind facility would also have the potential to create LARGE effects. The aesthetic impacts from new biomass generating plants would likely not have a major effect on visual resources, because the plants are small. Impacts would depend on the plants' locations. Landfill gas facilities would also be unlikely to negative affect aesthetics. Hydropower power facilities would only be likely to have significant effects if they require a large impoundment.

The NRC staff concludes that the overall aesthetic impacts from the first combination alternative could range from SMALL to LARGE, depending primarily on the aesthetic effects of the wind

power portion and whether a cooling tower is required for remaining IP unit.

- **Historic and Archeological Resources**

Onsite impacts to historical and cultural resources from the construction of a hybrid cooling tower may range from SMALL to MODERATE. The offsite impacts from the construction of biomass units, wind installations, landfill gas facilities, and hydropower are also expected to be small given the opportunity to evaluate and select the sites in accordance with applicable regulations and the ability to minimize impacts before construction. The impacts from construction of an onshore wind installation or hydropower facility could range from SMALL to MODERATE, depending on whether historical and archaeological resources are present. In that event, proper management of the resources, in conjunction with State historical preservation authorities, would assure that the impacts are not LARGE. Therefore, the NRC staff concludes that the overall impacts on historic and archeological resources from the first combination alternative would be SMALL to MODERATE.

- **Environmental Justice**

No impacts are anticipated in the IP2 and IP3 area that could disproportionately affect minority or low-income communities. Impacts from offsite activities would depend on the location of the activity. Many conservation measures, especially those involving weatherization or efficiency improvements to low-income households, can have disproportionately positive effects for low-income families. Overall, though, impacts to minority and low-income populations from the first combination alternative would depend substantially on the location of the installations and the characteristics of the surrounding communities. Impacts could range from SMALL to LARGE, depending on the location of the facilities relative to minority and low-income communities.

8.3.5.2 Impacts of Combination Alternative 2

The second combination alternative differs from the first in that it completely replaces IP2 and IP3 capacity. In contrast to the first combination alternative, a 400-MW(e) to 600 MW(e) NGCC plant is included as a repowering of an existing facility. NRC staff notes that it could also be located on the IP site. Either modifications to the existing onsite pipeline would be necessary to provide firm year-round service to the site without removing the service rights of other customers in New York and Connecticut served by the pipeline (Levitan and Associates, Inc. 2005) or new gas supplies would have be available from proposed LNG projects or other sources. A repowered NGCC plant at another site may have similar supply restrictions.

Like the first combination alternative, the second combination alternative employs 600 MW(e) from renewable energy sources (wind backed by other renewables). The impacts of these sources are described in the discussion of Combination Alternative 1 in Section 8.3.5.1 of this SEIS, and are not repeated in this section of the SEIS.

Finally, this option requires more aggressive energy conservation programs that would result in an energy savings of 1000 to 1200 MW(e). As described in Section 8.3.4 of this SEIS, these conservation efforts would have overall SMALL impacts, and are not repeated in this section of the SEIS.

- **Land Use**

Siting 400 to 600 MW(e) of NGCC capacity with a closed-cycle cooling system at a repowered facility would require about 18 ha (45 ac) and would likely have SMALL impacts on land use as the existing site as the unit or units could likely be constructed on previously-disturbed land and may be able to reuse substantial portions of onsite infrastructure. These effects would be similar if the NGCC capacity were located at the IP site

Land use impacts from the renewable portion of this alternative are identical to those in Combination Alternative 1.

Overall, the NRC staff considers that the land use impacts from this combination alternative would be SMALL to MODERATE.

- **Ecology**

As described in Section 8.3.1 of this SEIS, the impacts from the construction of five NGCC units at a repowered site or at IP2 and IP3 would have a SMALL impact on aquatic and terrestrial ecology.

Impacts from the renewable portion are SMALL to LARGE, as was the case in Combination Alternative 1.

Overall, the NRC staff considers that the ecological impacts from the second combination alternative would be SMALL to LARGE, depending on locations selected for each alternative.

- **Water Use and Quality**

Impacts from the renewable portions of this alternative are SMALL to LARGE, as were those considered in Combination Alternative 1.

The NGCC repowering portion of this alternative would create water demands, but would minimize them by relying on closed-cycle cooling. Impacts would be significantly smaller than those considered for the stand-alone NGCC alternative, which were SMALL at the IP site or a repowered site .

The overall effects on water use and quality of the second combination alternative would range from SMALL to LARGE, depending on locations of the alternatives and the type of hydroelectric facility constructed.

- **Air Quality**

The second combination alternative will have some impact on air quality as a result of emissions from the combustion alternatives. The impact from renewable portions would be the same as those described in Combination Alternative 1, which was SMALL to MODERATE. The NGCC, repowered facility would have emissions that range from 20 to 30 percent of those of the stand-alone NGCC alternative (which also had SMALL to MODERATE impacts). Nonetheless, the NRC staff concludes that the overall impacts from all of the new plants would range from SMALL to MODERATE.

- **Waste**

Impacts from renewable portions of this alternative would be the same as those in Combination Alternative 1, which were SMALL to LARGE. Wastes from the NGCC portion of this alternative would be similar in type to those in the stand-alone NGCC alternative, which had SMALL impacts. Overall, the NRC staff concludes that the impacts will be SMALL to LARGE.

- **Human Health**

The primary health concerns under this option would be occupational health and safety risks during construction As described in previous sections (for combination alternative 1 and the NGCC alternatives), if the risks are appropriately managed, the human health impacts from these or similar alternatives are SMALL.

The NRC staff concludes that the overall human health impact from the second combination alternative would be SMALL.

- **Socioeconomics**

The second combination alternative involves the complete shutdown of IP2 and IP3. As detailed in Section 8.2 of this SEIS, the socioeconomic impacts of shutting down the plant would be SMALL to MODERATE because of the loss of PILOT payments. (Constructing the NGCC portion of this alternative at the IP site could replace some of the PILOT payments. Levitan and Associates (2005) indicated that a smaller gas-fired plant may replace a significant portion of the PILOT payments currently provided by IP2 and IP3.) Some IP2 and IP3 jobs would be lost but replaced with decommissioning jobs and jobs associated with the construction and operation of the gas turbine plant. Other jobs would be generated by the construction of the offsite alternatives. While many of these jobs would cease at the end of construction, a fraction would remain during operation. Overall, the NRC staff concludes that the socioeconomic impacts from the second combination alternative would likely be SMALL to MODERATE, primarily because of the significant loss in revenues from the PILOT payments and the loss of IP2 and IP3 jobs.

- **Socioeconomics (Transportation)**

The aspects of this alternative will create modest transportation effects during construction. The renewable portions of this alternative will have the same impacts as in combination alternative 1, which were MODERATE. Also, construction of this NGCC facility will require fewer workers than the NGCC alternative considered in Section 8.3.1 of this SEIS because it is much smaller.

The NGCC unit may create noticeable impacts on gas transmission, but improvements to gas transmission or new LNG capacity may offset these impacts. Because winter heating customers take priority over utility generation customer, the plant is unlikely to have noticeable effects for other gas users, though it may need to burn fuel oil during peak demand periods.

Transportation impacts for this alternative would be moderated because the construction and operation workforce would be spread over multiple locations. No single project would have a significant long-term impact. Overall, the NRC staff concludes that the impact would likely be MODERATE.

- **Aesthetics**

Aesthetic impacts would occur primarily as a result of the wind power portion of this alternative, and may range from SMALL to LARGE from wind power alone. Other aspects of this alternative are unlikely to have noticeable effects. Particularly, NGCC repowering will have little, if any effect on the repowered site.

As a result, the NRC staff concludes that the overall aesthetic impacts from the second combination alternative would be SMALL to LARGE, depending on the degree to which wind

power installations affect areas where aesthetics are an important value.

- **Historic and Archeological Resources**

Onsite impacts to historical and cultural resources from the construction of a single gas turbine plant are expected to be SMALL. The offsite impacts from the construction of renewable installations are expected to be SMALL to MODERATE, as in Combination Alternative 1, given the opportunity to evaluate and select the sites in accordance with applicable regulations and the ability to minimize impacts before construction. The NGCC portion of this alternative will be constructed on an existing site, using existing infrastructure to the extent possible. Even if constructed on the IP2 and IP3 site, it is likely that the NGCC portion of this alternative could avoid sensitive areas. Therefore, the NRC staff concludes that the overall impacts on historic and archeological resources from the second combination alternative would be SMALL to MODERATE.

- **Environmental Justice**

Impacts from construction and operations would depend on the locations of the activities. Many conservation measures, especially those involving weatherization or efficiency improvements to low-income households, can have disproportionately positive effects for low-income families. Overall, though, impacts to minority and low-income populations from the second combination alternative would depend substantially on the location of the installations and the characteristics of the surrounding communities. Impacts could range from SMALL to LARGE, depending on the location of the facilities relative to minority and low-income communities .

Table 8-4. Summary of Environmental Impacts of Combination Alternatives

Impact Category	Combination 1		Combination 2	
	Impact	Comments	Impact	Comments
Land Use	SMALL to MODERATE	Impacts would depend on location of wind farm, type of hydro facilities, the site selection for the biomass plants, as well as land-disposal of wastes	SMALL to MODERATE	Impacts would depend on location of wind farm, type of hydro facilities, the site selection for the biomass plants.
Ecology	SMALL to LARGE	Impacts substantially depend on the type and location of facilities.	SMALL to LARGE	Impacts substantially depend on the type and location of facilities.
Water Use and Quality	SMALL to LARGE	Impacts depend largely on type and location of hydropower facilities.	SMALL to LARGE	Impacts depend largely on the type and location of hydropower facilities.
Air Quality	SMALL to MODERATE	Air emissions from biomass and landfill gas facilities would be minor given their size and possible multiple locations. One cooling tower could have an effect on air quality.	SMALL to MODERATE	Air emissions of the small biomass and landfill gas facilities would be minor considering their size and possible multiple locations; NGCC facility 20-30 percent of output of alternative in 8.3.1.
Waste	SMALL to LARGE	Construction waste impacts could range from SMALL to LARGE. Operational wastes are SMALL.	SMALL to LARGE	Construction waste impacts could range from SMALL to LARGE. Operational wastes are SMALL.

Table 8-4 (continued)

Impact Category	Combination 1		Combination 2	
	Impact	Comments	Impact	Comments
Human Health	SMALL	Emissions and occupational risks would be managed in accordance with applicable regulations.	SMALL	Emissions and occupational risks would be managed in accordance with applicable regulations.
Socioeconomics	SMALL	Some PILOT payments and jobs may be lost.	SMALL to MODERATE	IP2 and IP3 jobs and PILOT payments lost; some new jobs and taxes; minimum impacts from other power alternatives.
Socioeconomics (Transportation)	MODERATE	Construction impacts may be significant but short-lived.	MODERATE	Transportation effects may be noticeable during construction..
Aesthetics	SMALL to LARGE	Visual impacts from new wind turbines, depend on locations selected. Impacts also from cooling tower, if constructed.	SMALL to LARGE	Visual impacts from new wind turbines depend on the location chosen. Limited impact from combustion facilities.
Historic and Archeological Resources	SMALL to MODERATE	Cultural resources inventories would be needed to identify, evaluate, and mitigate potential impacts from construction.	SMALL to MODERATE	Cultural resources inventories would be needed to identify, evaluate, and mitigate potential impacts from construction.
Environmental Justice	SMALL to LARGE	Impacts would depend on plant locations.	SMALL to LARGE	Impacts would depend on plant locations.

8.4 Summary of Alternatives Considered

In this SEIS, the NRC staff has considered alternative actions to license renewal of IP2 and IP3 including the no-action alternative (discussed in Section 8.2), new generation or energy conservation alternatives (natural gas and conservation alternatives discussed in Sections 8.3.1 through 8.3.2), purchased electrical power (discussed in Section 8.3.3), alternative power-generating technologies that staff dismissed from detailed consideration (including supercritical coal-fired power; discussed in Section 8.3.4), and two combinations of alternatives (discussed in Section 8.3.5).

As established in the GEIS, the need for power from IP2 and IP3 is assumed by the NRC in the

license renewal process. Should the NRC not renew the IP2 and/or IP3 operating licenses, their generating capacity or load reduction (e.g., by conservation) would have to come from an alternative to license renewal (which may include some of the alternatives considered here).

Furthermore, even if the NRC renews the operating licenses, Entergy could elect not to operate either IP2 or IP3 for the full terms of the renewed licenses. Decisions about which alternative to implement, regardless of whether or not the NRC renews the IP2 and IP3 operating licenses, are outside the NRC's authority and are subject to consideration by Entergy, other power producers, and State-level decision makers (or non-NRC Federal-level decision makers where applicable).

Impacts from the conservation alternative are generally lower than those from other alternatives, including the proposed action. Impacts from the NGCC alternative at a repowered site or the IP site has the potential for larger air quality impacts, but smaller aquatic ecology impacts. Impacts from combination alternatives (with or without continued operation of one IP unit) that do not rely on conventional hydropower are likely to have smaller aquatic impacts than continued operation of IP2 and IP3, while they have potentially larger impacts in other areas, including air quality, aesthetics, and land use. Continued operation of one IP unit with closed-cycle cooling as part of a combination alternative would increase impacts to aesthetics, land use, waste, and air quality while reducing aquatic impacts. A NGCC alternative at a new site is likely to have a variety of more-significant impacts than continued operations of IP2 and IP3.

For most impact areas – land use, air quality, waste, transportation, aesthetics, historic and archaeological resources, for example – the closed-cycle cooling alternative has larger impacts that continued operation of IP2 and IP3 with its current cooling system. Its impact to aquatic ecology, however, is smaller than continued operation with the existing once-through cooling system. The NRC staff notes that this evaluation is not intended to preempt or prejudice NYSDEC SPDES proceedings in any way, and resolution of cooling system requirements for IP2 and IP3 remains and issue for resolution in these proceedings.

8.5 References

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9.0 SUMMARY AND CONCLUSIONS

Entergy Nuclear Operations, Inc. (Entergy), Entergy Nuclear Indian Point 2 (IP2), LLC, and Entergy Nuclear Indian Point 3 (IP3), LLC, are joint applicants for the renewal of the IP2 and IP3 operating licenses (joint applicants will be referred to as Entergy). On April 23, 2007, Entergy submitted an application to the U.S. Nuclear Regulatory Commission (NRC) to renew the IP2 and IP3 operating licenses for an additional 20 years each under Title 10, Part 54, "Requirements for Renewal of Operating Licenses for Nuclear Power Plants," of the *Code of Federal Regulations* (10 CFR Part 54) (Entergy 2007a). If the operating licenses are renewed, State and Federal (other than NRC) regulatory agencies and Entergy would ultimately decide whether the plant will continue to operate based on factors such as the need for power, power availability from other sources, regulatory mandates, or other matters within the agencies' jurisdictions or the purview of the owners. If the NRC decides not to renew the operating licenses, then the units must be shut down upon the expiration of the current operating licenses, subject to the conclusion of the license renewal process. If the license renewal review is ongoing at the time of license expiration, the units will be allowed to continue operating until the NRC makes a determination. The IP2 operating license will expire on September 28, 2013; the IP3 operating license will expire on December 12, 2015.

Section 102 of the National Environmental Policy Act of 1969, as amended (NEPA), requires an environmental impact statement (EIS) for major Federal actions that significantly affect the quality of the human environment. The NRC has implemented Section 102 of NEPA in 10 CFR Part 51, "Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions." As identified in 10 CFR Part 51, certain licensing and regulatory actions require an EIS. In 10 CFR 51.20(b)(2), the NRC requires preparation of an EIS or a supplement to an EIS for renewal of a reactor operating license. Furthermore, 10 CFR 51.95(c) states that the EIS prepared at the operating license renewal stage will be a supplement to NUREG-1437, Volumes 1 and 2, "Generic Environmental Impact Statement for License Renewal of Nuclear Plants" (hereafter referred to as the GEIS) (NRC 1996, 1999).[1]

Upon acceptance of the license renewal application for docketing, the NRC began the environmental review process described in 10 CFR Part 51 by publishing, on August 10, 2007, a Notice of Intent to prepare an EIS and conduct scoping (Volume 72, page 45075, of the *Federal Register* (72 FR 45075)). The NRC staff held two public scoping meetings on September 19, 2007, and visited the IP2 and IP3 site to conduct site audits on September 10–14, 2007, and September 24–27, 2007. The NRC staff reviewed the Entergy environmental report (ER) (Entergy 2007b) and compared it to the GEIS, consulted with other agencies, and conducted an independent review of the issues following the guidance set forth in NUREG-1555, Supplement 1, "Standard Review Plans for Environmental Reviews for Nuclear Power Plants, Supplement 1: Operating License Renewal" (NRC 2000). The NRC staff also considered the public comments received during the scoping process for preparation of the draft supplemental environmental impact statement (SEIS) for IP2 and IP3. Public comments and NRC staff responses are available in the Scoping Summary Report prepared by the NRC staff (ADAMS Accession Number ML083360115).

The NRC staff issued a draft SEIS in December 2008. Thereafter, the staff held public meetings

[1] The GEIS was originally issued in 1996. Addendum 1 to the GEIS was issued in 1999. Hereafter, all references to the GEIS include the GEIS and its Addendum 1.

in Cortlandt Manor, New York, on February 12, 2009 and presented the preliminary results of the NRC environmental review, answered questions from the public, and received comments on the draft SEIS. The NRC staff considered and addressed all of the comments received. The comments are reflected in this SEIS and/or addressed in Part 2 of Appendix A to this final SEIS.

This SEIS includes the NRC staff's analysis that considers and weighs the environmental effects of the proposed action (including cumulative impacts), the environmental impacts of alternatives to the proposed action, and mitigation measures available for reducing or avoiding adverse effects. This SEIS also includes the NRC staff's recommendation regarding the proposed action.

The NRC has adopted the following statement of purpose and need for license renewal from the GEIS:

> The purpose and need for the proposed action (renewal of an operating license) is to provide an option that allows for power generation capability beyond the term of a current nuclear power plant operating license to meet future system generating needs, as such needs may be determined by State, utility, and, where authorized, Federal (other than NRC) decision makers.

The evaluation criterion for the NRC staff's environmental review, as defined in 10 CFR 51.95(c)(4) and the GEIS, is to determine the following:

> … whether or not the adverse environmental impacts of license renewal are so great that preserving the option of license renewal for energy planning decisionmakers would be unreasonable.

Both the statement of purpose and need and the evaluation criterion implicitly acknowledge that there are factors, in addition to license renewal, that will ultimately determine whether an existing nuclear power plant continues to operate beyond the period of the current operating licenses.

NRC regulations (10 CFR 51.95(c) (2)) contain the following statement regarding the content of SEISs prepared at the license renewal stage:

> The supplemental environmental impact statement for license renewal is not required to include discussion of need for power or the economic costs and economic benefits of the proposed action or of alternatives to the proposed action except insofar as such benefits and costs are either essential for a determination regarding the inclusion of an alternative in the range of alternatives considered or relevant to mitigation. In addition, the supplemental environmental impact statement prepared at the license renewal stage need not discuss other issues not related to the environmental effects of the proposed action and the alternatives, or any aspect of the storage of spent fuel for the facility within thescope of the generic determination in 10 CFR 51.23(a) and in accordance with 10 CFR 51.23(b).[(2)]

[(2)] The title of 10 CFR 51.23 is "Temporary storage of spent fuel after cessation of reactor operation—generic determination of no significant environmental impact."

The GEIS contains the results of a systematic evaluation of the consequences of renewing an operating license and operating a nuclear power plant for an additional 20 years. It evaluates 92 environmental issues using the NRC's three-level standard of significance—SMALL, MODERATE, or LARGE—developed using the Council on Environmental Quality (CEQ) guidelines. The following definitions of the three significance levels are set forth in the footnotes to Table B-1 of Appendix B to Subpart A, "Environmental Effect of Renewing the Operating License of a Nuclear Power Plant," of 10 CFR Part 51:

SMALL—Environmental effects are not detectable or are so minor that they will neither destabilize nor noticeably alter any important attribute of the resource.

MODERATE—Environmental effects are sufficient to alter noticeably, but not to destabilize, important attributes of the resource.

LARGE—Environmental effects are clearly noticeable and are sufficient to destabilize important attributes of the resource.

For 69 of the 92 environmental issues considered in the GEIS, the analysis in the GEIS reached the following conclusions:

(1) The environmental impacts associated with the issue have been determined to apply either to all plants or, for some issues, to plants having a specific type of cooling system or other specified plant or site characteristics.

(2) A single significance level (i.e., SMALL, MODERATE, or LARGE) has been assigned to the impacts (except for collective offsite radiological impacts from the fuel cycle and from high-level waste and spent fuel disposal).

(3) Mitigation of adverse impacts associated with the issue has been considered in the analysis, and it has been determined that additional plant-specific mitigation measures are likely not to be sufficiently beneficial to warrant implementation.

These 69 issues were identified in the GEIS as Category 1 issues. In the absence of new and significant information, the NRC staff relied on conclusions as amplified by supporting information in the GEIS for issues designated as Category 1 in 10 CFR Part 51, Subpart A, Appendix B, Table B-1.

Of the 23 issues that do not meet the criteria set forth above, 21 are classified as Category 2 issues requiring analysis in a plant-specific SEIS. The remaining two issues, environmental justice and chronic effects of electromagnetic fields, were not categorized.

This SEIS documents the NRC staff's consideration of all 92 environmental issues identified in the GEIS. The NRC staff considered the environmental impacts associated with alternatives to license renewal and compared the environmental impacts of license renewal and the alternatives. The alternatives to license renewal that were considered include the no-action alternative (not renewing the operating licenses for IP2 and IP3), continued operation of either IP2 or IP3, alternative methods of power generation, and conservation. The NRC staff also considered an alternative that included continued operation of IP2 and IP3 with a closed-cycle cooling system.

9.1 Environmental Impacts of the Proposed Action—License Renewal

The NRC staff has established an independent process for identifying and evaluating the significance of any new information on the environmental impacts of license renewal. The NRC staff has not identified any information that is both new and significant related to Category 1 issues that would call into question the conclusions in the GEIS. In the IP2 and IP3 ER, Entergy identified leakage from onsite spent fuel pools as potentially new and significant information (Entergy 2007b). The NRC staff has reviewed Entergy's analysis of the leakage and has conducted an extensive onsite inspection of leakage to ground water, as identified in Section 2.2.7 of this SEIS. Based on the NRC staff's review of Entergy's analysis, the NRC staff's adoption of the NRC inspection report findings in this SEIS, and Entergy's subsequent statements (all discussed in Section 2.2.7), the NRC staff concludes that the abnormal liquid releases discussed by Entergy in its ER, while new information, are within the NRC's radiation safety standards contained in 10 CFR Part 20 and are not considered to have a significant impact on plant workers, the public, or the environment (i.e., while the information related to spent fuel pool leakage is new, it is not significant). Therefore, the NRC staff relied upon the conclusions of the GEIS for all Category 1 issues that are applicable to IP2 and IP3.

Entergy's license renewal application contains an analysis of the Category 2 issues that are applicable to IP2 and IP3, plus environmental justice and chronic effects from electromagnetic fields for a total of 23 issues. The NRC staff has reviewed the Entergy analysis and has conducted an independent review of each issue. Six of the Category 2 issues are not applicable because they are related to cooling systems, water use conflicts, and ground water use not found at IP2 and IP3.

As discussed in Chapter 3, scoping comments revealed—and Entergy indicated—that Entergy may replace reactor vessel heads and control rod drive mechanisms (CRDMs) in both units. As a result, the NRC staff addressed the impacts of these replacement activities in Chapter 3. This includes three Category 2 issues that apply only to refurbishment, six Category 2 issues that apply to refurbishment and continued operation, and one uncategorized issue, environmental justice, that applies to both refurbishment and continued operations. The NRC staff determined that all effects from refurbishment activities are of SMALL significance.

The NRC staff addresses twelve Category 2 issues related to impacts from continued operations and postulated accidents during the renewal term, as well as environmental justice and chronic effects of electromagnetic fields. Research is continuing in the area of chronic effects on electromagnetic fields, and a scientific consensus has not been reached. Therefore, no further evaluation of this issue is required. The NRC staff concludes that the potential environmental effects for 9 of the 12 categorized issues are of SMALL significance in the context of the standards set forth in the GEIS. The NRC staff concludes that the combined impacts from impingement and entrainment (each a separate issue) are MODERATE. Impacts from heat shock could range from SMALL to LARGE, based on the large uncertainties discussed in Chapter 4. Based on corrected data received since the completion of the draft SEIS, the NRC staff concludes that impacts to the endangered shortnose sturgeon which ranged from SMALL to LARGE in the draft SEIS are likely to be SMALL.

For severe accident mitigation alternatives (SAMAs), the NRC staff concludes that a

reasonable, comprehensive effort was made by Entergy to identify and evaluate SAMAs. Based on its review of the SAMAs for IP2 and IP3, and the plant improvements already made, the NRC staff concludes that several candidate SAMAs may be cost-beneficial. However, these SAMAs do not relate to adequately managing the effects of aging during the period of extended operation. Therefore, they need not be implemented as part of license renewal pursuant to 10 CFR Part 54.

For all issues of SMALL significance, current measures to mitigate the environmental impacts of plant operation were found to be adequate. For issues of MODERATE or LARGE significance (i.e., issues related to aquatic ecology), mitigation measures are addressed both in Chapter 4 and in Chapter 8 as alternatives based on determinations in the draft New York State Department of Environmental Conservation (NYSDEC) State Pollutant Discharge Elimination System (SPDES) permit proceeding, Clean Water Act Section 401 proceeding, and in draft policy statements published by the State. In Chapter 8, the NRC staff considers the impacts that may result if the plant converts from once-through cooling to a closed-cycle cooling system (Section 8.1.1).

Cumulative impacts of past, present, and reasonably foreseeable future actions were considered, regardless of what agency (Federal or non-Federal) or person undertakes such other actions. The NRC staff concludes that the cumulative impacts to the environment around IP2 and IP3 license renewal would be LARGE for some affected resources, given historical environmental impacts, current actions, and likely future actions. With the exception of aquatic resources, the contribution of IP2 and IP3 to cumulative impacts is SMALL.

The following sections discuss unavoidable adverse impacts, irreversible or irretrievable commitments of resources, and the relationship between local short-term use of the environment and long-term productivity.

9.1.1 Unavoidable Adverse Impacts

An environmental review conducted at the license renewal stage differs from the review conducted in support of a construction permit or operating license because the plant is in existence at the license renewal stage and has operated for a number of years. As a result, adverse impacts associated with the initial construction and operation have already occurred, have been mitigated, or have been avoided. The environmental impacts to be evaluated for license renewal are those associated with refurbishment and continued operation during the renewal term.

Adverse impacts of continued operation from (a) heat shock and (b) the combined effects of entrainment and impingement of fish and shellfish are considered to be potentially SMALL to LARGE, and MODERATE, respectively. Other adverse impacts are considered to be of SMALL significance.

Adverse impacts of likely alternatives to the operation of IP2 and IP3 vary greatly. Many have smaller impacts to aquatic resources than the proposed renewal of IP2 and IP3, though all have larger impacts than the proposed renewal of IP2 and IP3 in at least one other resource area.

9.1.2 Irreversible or Irretrievable Resource Commitments

The commitment of resources related to construction and operation of IP2 and IP3 during the current license period was made when the plant was built. The resource commitments to be considered in this SEIS are associated with continued operation of the plant for an additional 20 years. These resources include materials and equipment required for plant maintenance, operation, and refurbishment; the nuclear fuel used by the reactors; and ultimately, permanent offsite storage space for the spent fuel assemblies.

Entergy may be required to commit additional resources should the final NYSDEC SPDES permit require closed-cycle cooling (as required in the draft revised SPDES permit) and Entergy decides to (1) build and operate a closed-cycle cooling system to meet the permit's required reductions in impacts to aquatic ecology, or (2) make other modifications that meet the terms of the SPDES permit without retrofitting to closed-cycle cooling. However, regardless of the future status of the SPDES permit, significant resource commitments will be required during the renewal term for additional fuel and the permanent spent fuel storage space. IP2 and IP3 replace a portion of their fuel assemblies during every refueling outage, which typically occurs on a 24-month cycle (Entergy 2007a). Additional resources would also be committed to constructing and installing new reactor vessel heads and CRDMs.

The likely energy alternatives would also require a commitment of resources for construction of the replacement facilities, implementation of conservation measures, and in some cases, fuel to run plants. Significant resource commitments would also be required for development of transmission capacity. These resource commitments, however, would not necessarily come from Entergy as Entergy currently has no obligation to support power production in the New York area should IP2 and IP3 permanently shut down.

9.1.3 Short-Term Use Versus Long-Term Productivity

An initial balance between local short-term uses of the environment and maintenance and enhancement of long-term productivity at IP2 and IP3 was set when the plant was approved and construction began. Renewal of the operating licenses for IP2 and IP3 and continued operation of the plant would not alter the existing balance, but may postpone the availability of the site for other uses. Denial of the application to renew the operating licenses would lead to a shutdown of the plant that will alter the balance in a manner that depends on subsequent uses of the site. Furthermore, new replacement energy sources or conservation options will establish new balances at their respective locations.

9.2 Relative Significance of the Environmental Impacts of License Renewal and Alternatives

The proposed action is renewal of the operating licenses for IP2 and IP3. Chapter 2 describes the site, power plant, and interactions of the plant with the environment. Chapters 3 through 7 discuss environmental issues associated with renewal of the operating licenses. Environmental issues associated with the no-action alternative and alternatives such as new power generation, purchased power, conservation, and cooling system modifications are discussed in Chapter 8.

The significance of the environmental impacts from the proposed action (approval of the application for renewal of the operating licenses), the no-action alternative (denial of the application), an alternative involving altering plant operations to comply with the NYSDEC draft SPDES discharge permit, construction of gas-fired generating capacity at alternate sites, gas-fired generation of power at IP2 and IP3, and two combinations of alternatives are compared in Table 9-1. All new fossil-fueled alternatives presented in Table 9-1 are assumed to use closed-cycle cooling systems given current New York State regulations for new power plants.

Table 9-1 shows the significance of the plant-specific environmental effects of the proposed action (renewal of IP2 and IP3 operating licenses) as well as the environmental effects of alternatives to the proposed action. Impacts from license renewal would be SMALL for all impact categories except aquatic ecology, which includes the impacts of heat shock, entrainment, and impingement. Chapter 4 of this SEIS describes the MODERATE impacts of plant operation on aquatic ecology through impingement and entrainment (impact levels vary by species), and the potentially SMALL to LARGE impacts from thermal shock. Overall, impacts to aquatic ecology from continued operation of IP2 and IP3 without cooling system modifications or restoration actions are SMALL to LARGE. A single significance level was not assigned for the collective offsite radiological impacts from the fuel cycle and from high-level radioactive waste spent fuel disposal (see Chapter 6) or for the impacts of greenhouse gases (GHG).

The NRC staff is analysis indicates that the no-action alternative has the smallest effect, but it would necessitate additional actions to replace generation capacity (whether with newly-constructed power plants or purchased power) and/or to institute conservation programs. Impacts of the likely consequences of the no-action alternative would be similar to those of the energy alternatives that the NRC staff considered. All other alternative actions have impacts in at least four resource areas that reach SMALL to MODERATE or higher significance. Often, these impacts are the result of constructing new facilities or infrastructure.

9.3 Conclusions and Recommendations

Based on (1) the analysis and findings in the GEIS, (2) the ER and other information submitted by Entergy, (3) consultation with Federal, State, Tribal, and local agencies, (4) the NRC staff's consideration of public scoping comments received, and comments on the draft SEIS, and (5) the NRC staff's independent review, the recommendation of the NRC staff is that the Commission determine that the adverse environmental impacts of license renewal for IP2 and IP3 are not so great that preserving the option of license renewal for energy planning decision makers would be unreasonable.

Table 9-1. Summary of Environmental Significance of License Renewal and Alternatives

Impact Category	Proposed Action License Renewal	No-Action Alternative[b] Plant Shutdown	License Renewal with New Closed-Cycle Cooling	NGCC At the IP Site or a Repowered Site	NGCC At a New Site
Land Use	SMALL	SMALL	SMALL to LARGE	SMALL to MODERATE	MODERATE to LARGE
Ecology—Aquatic	MODERATE and SMALL to LARGE[a]	SMALL	SMALL	SMALL	SMALL
Ecology—Terrestrial	SMALL	SMALL	SMALL to MODERATE	SMALL	SMALL to MODERATE
Water Use and Quality	SMALL	SMALL	SMALL	SMALL	SMALL to MODERATE
Air Quality	SMALL	SMALL	SMALL to LARGE	SMALL to MODERATE	SMALL to MODERATE
Waste	SMALL	SMALL	SMALL to LARGE	SMALL	SMALL
Human Health	SMALL [c]	SMALL	SMALL	SMALL	SMALL
Socioeconomics	SMALL	SMALL to MODERATE	SMALL	SMALL to MODERATE	SMALL to MODERATE
Transportation	SMALL	SMALL	SMALL to LARGE	SMALL to MODERATE	SMALL to MODERATE
Aesthetics	SMALL	SMALL	MODERATE to LARGE	SMALL	SMALL to LARGE
Historical and Archeological Resources	SMALL	SMALL	SMALL to MODERATE	SMALL to MODERATE	SMALL to MODERATE
Environmental Justice	SMALL	SMALL	SMALL	SMALL to LARGE	SMALL to LARGE

Table 9-1 (continued)

Impact Category	Conservation/Energy Efficiency	Combination of Alternatives	
		Option 1: One IP unit, onsite gas, offsite renewables, and conservation	**Option 2: Gas, offsite renewables, additional imported power, and conservation**
Land Use	SMALL	SMALL to MODERATE	SMALL to MODERATE
Ecology – Aquatic	SMALL	SMALL to LARGE	SMALL to LARGE
Ecology – Terrestrial	SMALL	SMALL to LARGE	SMALL to LARGE
Water Use and Quality	SMALL	SMALL to LARGE	SMALL to LARGE
Air Quality	SMALL	SMALL to MODERATE	SMALL to MODERATE
Waste	SMALL	SMALL to LARGE	SMALL to LARGE
Human Health	SMALL	SMALL	SMALL
Socioeconomics	SMALL to MODERATE	SMALL	SMALL to MODERATE
Transportation	SMALL	MODERATE	MODERATE
Aesthetics	SMALL	SMALL to LARGE	SMALL to LARGE
Historical and Archeological Resources	SMALL	SMALL to MODERATE	SMALL to MODERATE
Environmental Justice	SMALL	SMALL to LARGE	SMALL to LARGE

(a) NRC staff analysis indicates that impingement and entrainment impacts are MODERATE, but that thermal shock effects could potentially range from SMALL to LARGE.
(b) The no-action alternative does not, on its own, meet the purpose and need of the GEIS. No action would necessitate other generation or conservation actions which may include—but are not limited to—the alternatives addressed in this table.
(c) For the collective offsite radiological impacts from the fuel cycle and from high-level waste and spent fuel disposal, a specific significance level was not assigned. See Chapter 6 for details.
(d) Analysis was based on use of a closed-cycle cooling system.

9.4 References

10 CFR Part 20. Code of Federal Regulations, Title 10, *Energy*, Part 20, "Standards for Protection Against Radiation."

10 CFR Part 51. Code of Federal Regulations, Title 10, *Energy,* Part 51, "Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions."

10 CFR Part 54. Code of Federal Regulations, Title 10, *Energy,* Part 54, "Requirements for Renewal of Operating Licenses for Nuclear Power Plants."

72 FR 45705. "Entergy Nuclear Operations, Inc., Indian Point Nuclear Generating Unit Nos. 2 and 3; Notice of Intent To Prepare an Environmental Impact Statement and Conduct Scoping Process." August 10, 2007

Entergy Nuclear Operations, Inc. (Entergy). 2007a. "Indian Point, Units 2 & 3, License Renewal Application." April 23, 2007. Agencywide Documents Access and Management System (ADAMS) Accession No. ML071210512.

Entergy Nuclear Operations, Inc. (Entergy). 2007b. "Applicant's Environment Report, Operating License Renewal Stage." (Appendix E to Indian Point, Units 2 and 3, License Renewal Application). April 23, 2007. ADAMS Accession No. ML071210530.

National Environmental Policy Act of 1969, as amended (NEPA). 42 USC 4321, et seq.

Nuclear Regulatory Commission (NRC). 1996. NUREG-1437, Volumes 1 and 2, "Generic Environmental Impact Statement for License Renewal of Nuclear Power Plants (GEIS)." Washington, DC. May 1996.

Nuclear Regulatory Commission (NRC). 1999. NUREG-1437, Volume 1, Addendum 1, "Generic Environmental Impact Statement for License Renewal of Nuclear Plants, Main Report," Section 6.3, "Transportation," Table 9.1, "Summary of Findings on NEPA Issues for License Renewal of Nuclear Power Plants, Final Report." Washington, DC.

Nuclear Regulatory Commission (NRC). 2000. NUREG-1555, Supplement 1, "Standard Review Plans for Environmental Reviews for Nuclear Power Plants, Supplement 1: Operating License Renewal." Washington, DC.

in Cortlandt Manor, New York, on February 12, 2009 and presented the preliminary results of the NRC environmental review, answered questions from the public, and received comments on the draft SEIS. The NRC staff considered and addressed all of the comments received. The comments are reflected in this SEIS and/or addressed in Part 2 of Appendix A to this final SEIS.

This SEIS includes the NRC staff's analysis that considers and weighs the environmental effects of the proposed action (including cumulative impacts), the environmental impacts of alternatives to the proposed action, and mitigation measures available for reducing or avoiding adverse effects. This SEIS also includes the NRC staff's recommendation regarding the proposed action.

The NRC has adopted the following statement of purpose and need for license renewal from the GEIS:

> The purpose and need for the proposed action (renewal of an operating license) is to provide an option that allows for power generation capability beyond the term of a current nuclear power plant operating license to meet future system generating needs, as such needs may be determined by State, utility, and, where authorized, Federal (other than NRC) decision makers.

The evaluation criterion for the NRC staff's environmental review, as defined in 10 CFR 51.95(c)(4) and the GEIS, is to determine the following:

> … whether or not the adverse environmental impacts of license renewal are so great that preserving the option of license renewal for energy planning decisionmakers would be unreasonable.

Both the statement of purpose and need and the evaluation criterion implicitly acknowledge that there are factors, in addition to license renewal, that will ultimately determine whether an existing nuclear power plant continues to operate beyond the period of the current operating licenses.

NRC regulations (10 CFR 51.95(c) (2)) contain the following statement regarding the content of SEISs prepared at the license renewal stage:

> The supplemental environmental impact statement for license renewal is not required to include discussion of need for power or the economic costs and economic benefits of the proposed action or of alternatives to the proposed action except insofar as such benefits and costs are either essential for a determination regarding the inclusion of an alternative in the range of alternatives considered or relevant to mitigation. In addition, the supplemental environmental impact statement prepared at the license renewal stage need not discuss other issues not related to the environmental effects of the proposed action and the alternatives, or any aspect of the storage of spent fuel for the facility within thescope of the generic determination in 10 CFR 51.23(a) and in accordance with 10 CFR 51.23(b).[(2)]

[(2)] The title of 10 CFR 51.23 is "Temporary storage of spent fuel after cessation of reactor operation—generic determination of no significant environmental impact."

The GEIS contains the results of a systematic evaluation of the consequences of renewing an operating license and operating a nuclear power plant for an additional 20 years. It evaluates 92 environmental issues using the NRC's three-level standard of significance—SMALL, MODERATE, or LARGE—developed using the Council on Environmental Quality (CEQ) guidelines. The following definitions of the three significance levels are set forth in the footnotes to Table B-1 of Appendix B to Subpart A, "Environmental Effect of Renewing the Operating License of a Nuclear Power Plant," of 10 CFR Part 51:

SMALL—Environmental effects are not detectable or are so minor that they will neither destabilize nor noticeably alter any important attribute of the resource.

MODERATE—Environmental effects are sufficient to alter noticeably, but not to destabilize, important attributes of the resource.

LARGE—Environmental effects are clearly noticeable and are sufficient to destabilize important attributes of the resource.

For 69 of the 92 environmental issues considered in the GEIS, the analysis in the GEIS reached the following conclusions:

(1) The environmental impacts associated with the issue have been determined to apply either to all plants or, for some issues, to plants having a specific type of cooling system or other specified plant or site characteristics.

(2) A single significance level (i.e., SMALL, MODERATE, or LARGE) has been assigned to the impacts (except for collective offsite radiological impacts from the fuel cycle and from high-level waste and spent fuel disposal).

(3) Mitigation of adverse impacts associated with the issue has been considered in the analysis, and it has been determined that additional plant-specific mitigation measures are likely not to be sufficiently beneficial to warrant implementation.

These 69 issues were identified in the GEIS as Category 1 issues. In the absence of new and significant information, the NRC staff relied on conclusions as amplified by supporting information in the GEIS for issues designated as Category 1 in 10 CFR Part 51, Subpart A, Appendix B, Table B-1.

Of the 23 issues that do not meet the criteria set forth above, 21 are classified as Category 2 issues requiring analysis in a plant-specific SEIS. The remaining two issues, environmental justice and chronic effects of electromagnetic fields, were not categorized.

This SEIS documents the NRC staff's consideration of all 92 environmental issues identified in the GEIS. The NRC staff considered the environmental impacts associated with alternatives to license renewal and compared the environmental impacts of license renewal and the alternatives. The alternatives to license renewal that were considered include the no-action alternative (not renewing the operating licenses for IP2 and IP3), continued operation of either IP2 or IP3, alternative methods of power generation, and conservation. The NRC staff also considered an alternative that included continued operation of IP2 and IP3 with a closed-cycle cooling system.

9.1 Environmental Impacts of the Proposed Action—License Renewal

The NRC staff has established an independent process for identifying and evaluating the significance of any new information on the environmental impacts of license renewal. The NRC staff has not identified any information that is both new and significant related to Category 1 issues that would call into question the conclusions in the GEIS. In the IP2 and IP3 ER, Entergy identified leakage from onsite spent fuel pools as potentially new and significant information (Entergy 2007b). The NRC staff has reviewed Entergy's analysis of the leakage and has conducted an extensive onsite inspection of leakage to ground water, as identified in Section 2.2.7 of this SEIS. Based on the NRC staff's review of Entergy's analysis, the NRC staff's adoption of the NRC inspection report findings in this SEIS, and Entergy's subsequent statements (all discussed in Section 2.2.7), the NRC staff concludes that the abnormal liquid releases discussed by Entergy in its ER, while new information, are within the NRC's radiation safety standards contained in 10 CFR Part 20 and are not considered to have a significant impact on plant workers, the public, or the environment (i.e., while the information related to spent fuel pool leakage is new, it is not significant). Therefore, the NRC staff relied upon the conclusions of the GEIS for all Category 1 issues that are applicable to IP2 and IP3.

Entergy's license renewal application contains an analysis of the Category 2 issues that are applicable to IP2 and IP3, plus environmental justice and chronic effects from electromagnetic fields for a total of 23 issues. The NRC staff has reviewed the Entergy analysis and has conducted an independent review of each issue. Six of the Category 2 issues are not applicable because they are related to cooling systems, water use conflicts, and ground water use not found at IP2 and IP3.

As discussed in Chapter 3, scoping comments revealed—and Entergy indicated—that Entergy may replace reactor vessel heads and control rod drive mechanisms (CRDMs) in both units. As a result, the NRC staff addressed the impacts of these replacement activities in Chapter 3. This includes three Category 2 issues that apply only to refurbishment, six Category 2 issues that apply to refurbishment and continued operation, and one uncategorized issue, environmental justice, that applies to both refurbishment and continued operations. The NRC staff determined that all effects from refurbishment activities are of SMALL significance.

The NRC staff addresses twelve Category 2 issues related to impacts from continued operations and postulated accidents during the renewal term, as well as environmental justice and chronic effects of electromagnetic fields. Research is continuing in the area of chronic effects on electromagnetic fields, and a scientific consensus has not been reached. Therefore, no further evaluation of this issue is required. The NRC staff concludes that the potential environmental effects for 9 of the 12 categorized issues are of SMALL significance in the context of the standards set forth in the GEIS. The NRC staff concludes that the combined impacts from impingement and entrainment (each a separate issue) are MODERATE. Impacts from heat shock could range from SMALL to LARGE, based on the large uncertainties discussed in Chapter 4. Based on corrected data received since the completion of the draft SEIS, the NRC staff concludes that impacts to the endangered shortnose sturgeon which ranged from SMALL to LARGE in the draft SEIS are likely to be SMALL.

For severe accident mitigation alternatives (SAMAs), the NRC staff concludes that a

reasonable, comprehensive effort was made by Entergy to identify and evaluate SAMAs. Based on its review of the SAMAs for IP2 and IP3, and the plant improvements already made, the NRC staff concludes that several candidate SAMAs may be cost-beneficial. However, these SAMAs do not relate to adequately managing the effects of aging during the period of extended operation. Therefore, they need not be implemented as part of license renewal pursuant to 10 CFR Part 54.

For all issues of SMALL significance, current measures to mitigate the environmental impacts of plant operation were found to be adequate. For issues of MODERATE or LARGE significance (i.e., issues related to aquatic ecology), mitigation measures are addressed both in Chapter 4 and in Chapter 8 as alternatives based on determinations in the draft New York State Department of Environmental Conservation (NYSDEC) State Pollutant Discharge Elimination System (SPDES) permit proceeding, Clean Water Act Section 401 proceeding, and in draft policy statements published by the State. In Chapter 8, the NRC staff considers the impacts that may result if the plant converts from once-through cooling to a closed-cycle cooling system (Section 8.1.1).

Cumulative impacts of past, present, and reasonably foreseeable future actions were considered, regardless of what agency (Federal or non-Federal) or person undertakes such other actions. The NRC staff concludes that the cumulative impacts to the environment around IP2 and IP3 license renewal would be LARGE for some affected resources, given historical environmental impacts, current actions, and likely future actions. With the exception of aquatic resources, the contribution of IP2 and IP3 to cumulative impacts is SMALL.

The following sections discuss unavoidable adverse impacts, irreversible or irretrievable commitments of resources, and the relationship between local short-term use of the environment and long-term productivity.

9.1.1 Unavoidable Adverse Impacts

An environmental review conducted at the license renewal stage differs from the review conducted in support of a construction permit or operating license because the plant is in existence at the license renewal stage and has operated for a number of years. As a result, adverse impacts associated with the initial construction and operation have already occurred, have been mitigated, or have been avoided. The environmental impacts to be evaluated for license renewal are those associated with refurbishment and continued operation during the renewal term.

Adverse impacts of continued operation from (a) heat shock and (b) the combined effects of entrainment and impingement of fish and shellfish are considered to be potentially SMALL to LARGE, and MODERATE, respectively. Other adverse impacts are considered to be of SMALL significance.

Adverse impacts of likely alternatives to the operation of IP2 and IP3 vary greatly. Many have smaller impacts to aquatic resources than the proposed renewal of IP2 and IP3, though all have larger impacts than the proposed renewal of IP2 and IP3 in at least one other resource area.

9.1.2 Irreversible or Irretrievable Resource Commitments

The commitment of resources related to construction and operation of IP2 and IP3 during the current license period was made when the plant was built. The resource commitments to be considered in this SEIS are associated with continued operation of the plant for an additional 20 years. These resources include materials and equipment required for plant maintenance, operation, and refurbishment; the nuclear fuel used by the reactors; and ultimately, permanent offsite storage space for the spent fuel assemblies.

Entergy may be required to commit additional resources should the final NYSDEC SPDES permit require closed-cycle cooling (as required in the draft revised SPDES permit) and Entergy decides to (1) build and operate a closed-cycle cooling system to meet the permit's required reductions in impacts to aquatic ecology, or (2) make other modifications that meet the terms of the SPDES permit without retrofitting to closed-cycle cooling. However, regardless of the future status of the SPDES permit, significant resource commitments will be required during the renewal term for additional fuel and the permanent spent fuel storage space. IP2 and IP3 replace a portion of their fuel assemblies during every refueling outage, which typically occurs on a 24-month cycle (Entergy 2007a). Additional resources would also be committed to constructing and installing new reactor vessel heads and CRDMs.

The likely energy alternatives would also require a commitment of resources for construction of the replacement facilities, implementation of conservation measures, and in some cases, fuel to run plants. Significant resource commitments would also be required for development of transmission capacity. These resource commitments, however, would not necessarily come from Entergy as Entergy currently has no obligation to support power production in the New York area should IP2 and IP3 permanently shut down.

9.1.3 Short-Term Use Versus Long-Term Productivity

An initial balance between local short-term uses of the environment and maintenance and enhancement of long-term productivity at IP2 and IP3 was set when the plant was approved and construction began. Renewal of the operating licenses for IP2 and IP3 and continued operation of the plant would not alter the existing balance, but may postpone the availability of the site for other uses. Denial of the application to renew the operating licenses would lead to a shutdown of the plant that will alter the balance in a manner that depends on subsequent uses of the site. Furthermore, new replacement energy sources or conservation options will establish new balances at their respective locations.

9.2 Relative Significance of the Environmental Impacts of License Renewal and Alternatives

The proposed action is renewal of the operating licenses for IP2 and IP3. Chapter 2 describes the site, power plant, and interactions of the plant with the environment. Chapters 3 through 7 discuss environmental issues associated with renewal of the operating licenses. Environmental issues associated with the no-action alternative and alternatives such as new power generation, purchased power, conservation, and cooling system modifications are discussed in Chapter 8.

The significance of the environmental impacts from the proposed action (approval of the application for renewal of the operating licenses), the no-action alternative (denial of the application), an alternative involving altering plant operations to comply with the NYSDEC draft SPDES discharge permit, construction of gas-fired generating capacity at alternate sites, gas-fired generation of power at IP2 and IP3, and two combinations of alternatives are compared in Table 9-1. All new fossil-fueled alternatives presented in Table 9-1 are assumed to use closed-cycle cooling systems given current New York State regulations for new power plants.

Table 9-1 shows the significance of the plant-specific environmental effects of the proposed action (renewal of IP2 and IP3 operating licenses) as well as the environmental effects of alternatives to the proposed action. Impacts from license renewal would be SMALL for all impact categories except aquatic ecology, which includes the impacts of heat shock, entrainment, and impingement. Chapter 4 of this SEIS describes the MODERATE impacts of plant operation on aquatic ecology through impingement and entrainment (impact levels vary by species), and the potentially SMALL to LARGE impacts from thermal shock. Overall, impacts to aquatic ecology from continued operation of IP2 and IP3 without cooling system modifications or restoration actions are SMALL to LARGE. A single significance level was not assigned for the collective offsite radiological impacts from the fuel cycle and from high-level radioactive waste spent fuel disposal (see Chapter 6) or for the impacts of greenhouse gases (GHG).

The NRC staff is analysis indicates that the no-action alternative has the smallest effect, but it would necessitate additional actions to replace generation capacity (whether with newly-constructed power plants or purchased power) and/or to institute conservation programs. Impacts of the likely consequences of the no-action alternative would be similar to those of the energy alternatives that the NRC staff considered. All other alternative actions have impacts in at least four resource areas that reach SMALL to MODERATE or higher significance. Often, these impacts are the result of constructing new facilities or infrastructure.

9.3 Conclusions and Recommendations

Based on (1) the analysis and findings in the GEIS, (2) the ER and other information submitted by Entergy, (3) consultation with Federal, State, Tribal, and local agencies, (4) the NRC staff's consideration of public scoping comments received, and comments on the draft SEIS, and (5) the NRC staff's independent review, the recommendation of the NRC staff is that the Commission determine that the adverse environmental impacts of license renewal for IP2 and IP3 are not so great that preserving the option of license renewal for energy planning decision makers would be unreasonable.

Table 9-1. Summary of Environmental Significance of License Renewal and Alternatives

Impact Category	Proposed Action: License Renewal	No-Action Alternative[b]: Plant Shutdown	License Renewal with: New Closed-Cycle Cooling	NGCC: At the IP Site or a Repowered Site	NGCC: At a New Site
Land Use	SMALL	SMALL	SMALL to LARGE	SMALL to MODERATE	MODERATE to LARGE
Ecology—Aquatic	MODERATE and SMALL to LARGE[a]	SMALL	SMALL	SMALL	SMALL
Ecology—Terrestrial	SMALL	SMALL	SMALL to MODERATE	SMALL	SMALL to MODERATE
Water Use and Quality	SMALL	SMALL	SMALL	SMALL	SMALL to MODERATE
Air Quality	SMALL	SMALL	SMALL to LARGE	SMALL to MODERATE	SMALL to MODERATE
Waste	SMALL	SMALL	SMALL to LARGE	SMALL	SMALL
Human Health	SMALL [c]	SMALL	SMALL	SMALL	SMALL
Socioeconomics	SMALL	SMALL to MODERATE	SMALL	SMALL to MODERATE	SMALL to MODERATE
Transportation	SMALL	SMALL	SMALL to LARGE	SMALL to MODERATE	SMALL to MODERATE
Aesthetics	SMALL	SMALL	MODERATE to LARGE	SMALL	SMALL to LARGE
Historical and Archeological Resources	SMALL	SMALL	SMALL to MODERATE	SMALL to MODERATE	SMALL to MODERATE
Environmental Justice	SMALL	SMALL	SMALL	SMALL to LARGE	SMALL to LARGE

Table 9-1 (continued)

Impact Category	Conservation/Energy Efficiency	Combination of Alternatives	
		Option 1: One IP unit, onsite gas, offsite renewables, and conservation	**Option 2: Gas, offsite renewables, additional imported power, and conservation**
Land Use	SMALL	SMALL to MODERATE	SMALL to MODERATE
Ecology – Aquatic	SMALL	SMALL to LARGE	SMALL to LARGE
Ecology – Terrestrial	SMALL	SMALL to LARGE	SMALL to LARGE
Water Use and Quality	SMALL	SMALL to LARGE	SMALL to LARGE
Air Quality	SMALL	SMALL to MODERATE	SMALL to MODERATE
Waste	SMALL	SMALL to LARGE	SMALL to LARGE
Human Health	SMALL	SMALL	SMALL
Socioeconomics	SMALL to MODERATE	SMALL	SMALL to MODERATE
Transportation	SMALL	MODERATE	MODERATE
Aesthetics	SMALL	SMALL to LARGE	SMALL to LARGE
Historical and Archeological Resources	SMALL	SMALL to MODERATE	SMALL to MODERATE
Environmental Justice	SMALL	SMALL to LARGE	SMALL to LARGE

(a) NRC staff analysis indicates that impingement and entrainment impacts are MODERATE, but that thermal shock effects could potentially range from SMALL to LARGE.
(b) The no-action alternative does not, on its own, meet the purpose and need of the GEIS. No action would necessitate other generation or conservation actions which may include—but are not limited to—the alternatives addressed in this table.
(c) For the collective offsite radiological impacts from the fuel cycle and from high-level waste and spent fuel disposal, a specific significance level was not assigned. See Chapter 6 for details.
(d) Analysis was based on use of a closed-cycle cooling system.

9.4 References

10 CFR Part 20. Code of Federal Regulations, Title 10, *Energy*, Part 20, "Standards for Protection Against Radiation."

10 CFR Part 51. Code of Federal Regulations, Title 10, *Energy,* Part 51, "Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions."

10 CFR Part 54. Code of Federal Regulations, Title 10, *Energy,* Part 54, "Requirements for Renewal of Operating Licenses for Nuclear Power Plants."

72 FR 45705. "Entergy Nuclear Operations, Inc., Indian Point Nuclear Generating Unit Nos. 2 and 3; Notice of Intent To Prepare an Environmental Impact Statement and Conduct Scoping Process." August 10, 2007

Entergy Nuclear Operations, Inc. (Entergy). 2007a. "Indian Point, Units 2 & 3, License Renewal Application." April 23, 2007. Agencywide Documents Access and Management System (ADAMS) Accession No. ML071210512.

Entergy Nuclear Operations, Inc. (Entergy). 2007b. "Applicant's Environment Report, Operating License Renewal Stage." (Appendix E to Indian Point, Units 2 and 3, License Renewal Application). April 23, 2007. ADAMS Accession No. ML071210530.

National Environmental Policy Act of 1969, as amended (NEPA). 42 USC 4321, et seq.

Nuclear Regulatory Commission (NRC). 1996. NUREG-1437, Volumes 1 and 2, "Generic Environmental Impact Statement for License Renewal of Nuclear Power Plants (GEIS)." Washington, DC. May 1996.

Nuclear Regulatory Commission (NRC). 1999. NUREG-1437, Volume 1, Addendum 1, "Generic Environmental Impact Statement for License Renewal of Nuclear Plants, Main Report," Section 6.3, "Transportation," Table 9.1, "Summary of Findings on NEPA Issues for License Renewal of Nuclear Power Plants, Final Report." Washington, DC.

Nuclear Regulatory Commission (NRC). 2000. NUREG-1555, Supplement 1, "Standard Review Plans for Environmental Reviews for Nuclear Power Plants, Supplement 1: Operating License Renewal." Washington, DC.

Appendix A

Comments Received on the Environmental Review

Appendix A

Comments Received on the Environmental Review

Comments Received During Scoping and Scoping Summary Adoption

In this appendix, the NRC staff adopts the Scoping Summary Report for Indian Point Nuclear Generating Unit Nos. 2 and 3 as prepared by the NRC staff in response to comments received on the scope of the environmental review. The NRC staff issued the scoping summary report on December 19, 2008. The Scoping Summary Report is available for public inspection in the NRC Public Document Room (PDR), located at One White Flint North, 11555 Rockville Pike, Rockville, Maryland, 20852, or from the NRC's Agencywide Documents Access and Management System (ADAMS).

The ADAMS Public Electronic Reading Room is accessible at http://www.nrc.gov/reading-rm/adams/web-based.html. The scoping summary report is listed under Accession No. ML083360115.

Persons who do not have access to ADAMS or who encounter problems in accessing the documents located in ADAMS should contact the NRC's PDR reference staff by telephone at 1-800-397-4209, or 301-415-4737, or by e-mail at pdr@nrc.gov.

On August 10, 2007, the NRC published a Notice of Intent in the Federal Register (72 FR 45075) to notify the public of the Staff's intent to prepare a plant-specific supplement to the GEIS (SEIS) regarding the renewal application for the IP2 and IP3 operating license. As outlined by NEPA, the NRC initiated the scoping process with the issuance of the Federal Register Notice. The NRC invited the applicant, federal, state, local, and tribal government agencies, local organizations, and individuals to participate in the scoping process by providing oral comments at scheduled public meetings and/or submitting written suggestions and comments no later than October 12, 2007.

The scoping process included two public scoping meetings, which were both held on September 19, 2007, at Colonial Terrace, 119 Oregon Road, Cortlandt Manor, New York. The NRC issued press releases and distributed flyers locally. Both sessions began with NRC staff members providing a brief overview of the license renewal process and the NEPA process. Following the NRC's prepared statements, the meetings were open for public comments. Approximately 50 attendees provided oral comments that were recorded and transcribed by a certified court reporter.

The meeting summary, which was issued on October 24, 2007, and the associated transcripts can be found in the NRC PDR or in ADAMS at Accession No. ML072851079. The transcripts of the meetings can be found in ADAMS at Accession Numbers ML072830682 and ML072890209.

The scoping summary contains all comments received on the review, as well as the NRC staff's responses to those comments. Comments received on the draft SEIS will be included in this Appendix of the final SEIS.

A.1 Comments Received on the Draft SEIS

Pursuant to 10 CFR Part 51, the staff transmitted the *Generic Environmental Impact Statement for License Renewal of Nuclear Plants, Regarding Indian Point Nuclear Generating Units 2 and 3, Draft Report for Comment* (NUREG-1437, Supplement 38, referred to as the draft SEIS) to Federal, State, Native American Tribal, and local government agencies as well as interested members of the public. As part of the process to solicit public comments on the DSEIS, the staff:

• placed a copy of the DSEIS in the NRC's electronic Public Document Room, its license renewal website, White Plains Public Library(White Plains, NY), Hendrick Hudson Free Library (Montrose, NY) and the Field Library(Peekskill, NY),

• sent copies of the DSEIS to the applicant, members of the public who requested copies, and certain Federal, State, Native American Tribal, and local agencies,

• published a notice of availability of the DSEIS in the *Federal Register* on December 31, 2008, (71 FR 75280),

• issued press releases and public announcements such as advertisements in local newspapers and postings in public places announcing the issuance of the DSEIS, the public meetings, and instructions on how to comment on the DSEIS,

• held public meetings in Cortlandt Manor, New York, on February 12, 2009, to describe the results of the environmental review and answer related questions,

• established an e-mail address to receive comments on the DSEIS through the Internet.

During the DSEIS comment period, the staff received comments from 183 individuals or groups. Eighty-eight commenters spoke during the public meetings. The staff reviewed the public meeting transcripts and the comment letters that are part of the docket file for the application, all of which are available in the NRC's Agencywide Documents Access Management System (ADAMS). ADAMS is accessible at http://www.nrc.gov/reading-rm/adams.html. Appendix A, Part II, Section A.2, contains a summary of the comments and the staff's responses. Appendix A, Part II, Section A.3, contains the comment letters and commenters excerpts from the transcripts. The comment period closed on March 18, 2009.

No individuals or groups requested an extension of the comment period. Several groups, however, submitted comments months after the close of the comment period, most recently on November 5, 2010. The NRC staff found it impracticable to address these comments, and those late-filed comments are not included in this appendix.

Each comment identified by the staff was assigned a specific commenter identifier (marker). That identifier is typed in the letter's margin at the beginning of the comment discussion.

Table A-1. Individuals and/or Groups Providing Comments on the DSEIS.
Commenters appear in alphabetical order, and each commenter has been given a unique commenter identification number.

Commenter	Affiliation (if stated)	Commenter ID Number
Adams, Kenneth	Business Council of New York State	1

Commenter	Affiliation (if stated)	Commenter ID Number
Allen, Judy	Resident, Putnam Valley	2
American Citizen	American Citizens	3
Anders, Fred	NYS Office of Coastal, Local Government and Community Sustainability	4
Anthony, Rev. Dr. Cheryl	Jude International Christian Center	5
Argintar, Herbert		6
Ball, Gregory	New York State Assembly	7
Banfield, William	Empire State Regional Council of Carpenters	8
Bard Center for Environmental Policy	Auropriya A. Reddy, Emily B. Fischer, Katherine C. Galbraith, Kristine E. Pierce, Shaylah C. Reagan, Michel N. Wahome, Matthew A. Guenther, Kaleena S. Miller, Taryn L. Morris, Joshua Z. Jacobson, Jaclyn Harrison, Lindsay Chapman, Anne E. Kline, Than H. Phoo, Daniel Smith	9
Barthelme, Margaret	Student, Ramapo College	10
Bartholomew, Alice		11
Bassi, Laura		12
Berasi, Pete		13
Bigby, Derry	African American Environmentalist Association	14
Bittermann, Sister Rosemarie	St. Patrick Villa	15
Blades, Adam	Student, Ramapo College	16
Blumenthal, Richard	Connecticut, Attorney General	17
Boorman, Lindsay		18
Bowman, Reginald	NYC Housing Authority's Resident Council	19
Brancato, Deborah	Riverkeeper	20
Brennan, Chris		21
Bron, Gary		22
Burruss, Melvin	African American Men of Westchester	23
Burton, Nancy	Mothers Milk Project	24
Butler, Elizabeth		25
Byrd, Ricardo	National Association of Neighborhoods	26
Calvani, Dorothy		27
Campbell, Joanne	Albany Houses Tenants Association of Brooklyn	28
Capurso, Tom	Local 3	29
Carmody, Greg	Student, Ramapo College	30
Castro, Maria	Hispanic Energy Coalition	31

Commenter	Affiliation (if stated)	Commenter ID Number
Chernoff, Patricia		32
Clark, Pamela	Hudson River Club	33
Clegg, Thomas		34
Cohen, Lisa		35
Connolly, Jerry	Coalition of Labor for Energy and Jobs	36
Cooper, Loraine		37
Cypser, Betty	Raging Grannies	38
Cypser, Rudy		39
Dacimo, Fred	Entergy	40
Daly, Mary Ann		41
Davis, Darwin	Greater Harlem Chamber of Commerce	42
Davis, Jill	Hendrick Hudson Free Library	43
DeAngelo, Carol		44
Degraff, Rev. Jacques	100 Black Men	45
Digby, Derry	African American Environmental Association	46
DiRocco, Steve		47
Donahue, Mayor Al	Mayor, Town of Buchanan	48
Durett, Dan	African American Environmentalists Association	49
Edelstein, Michael	Ramapo College	50
Evans, Laurie	Westchester SAFE	51
Falciano, Patrick		52
Federspiel, John	Hudson Valley Hospital System	53
Feinberg, Janie		54
Filippelli, John	United States Environmental Protection Agency	55
Fitzpatrick, Brian		56
Forehand, Ron	Hudson Valley Gateway Chamber of Commerce	57
Form Letter		58
Foster, Mary	Mayor, Peekskill	59
Fraiser, Andrew	NextGen Network	60
Friedman, Carolyn	Resident, Nyack	61
Frye, Glen	Brooklyn Anti-Violence Coalition	62
Funck, John		63
Furgatch, Lisa		64
Garcia, Frank	Bronx Hispanic Chamber of Commerce	65

Commenter	Affiliation (if stated)	Commenter ID Number
Garisto, Mary Ann		66
Gordon, Marsha	Business Council of Westchester	67
Grady, Peter		68
Raging Grannies		69
Gould, Ross	Attorney (Working with HRSC)	70
Gray, Jennifer		71
Green, George		72
Greene, Manna	Hudson River Sloop Clearwater	73
Hassman, Howard		74
Hawkins, Gerard	Resident, Croton on Hudson	75
Helman, Lucille		76
Hirsh, Seth		77
Hohlfeld, Bill	Local 46 Labor Management Cooperative Trust	78
Hudson River Sloop Clearwater, Inc.	Manna Jo Greene, Ross Gould, Esq.	79
Imoberdorf, Olivia		80
Indusi, Joan		81
Jacobs, Mark		82
Johnson, Tom	Buchanan Firefighter	83
Karamaty, Valery	Raging Grannies	84
Karas, Joe	Carpenters Union Local 11	85
Kardos, Terry	Resident, Cortlandt Manor	86
Kardos, Theresa	Resident, Cortlandt Manor	87
Kearney, Gail		88
Keenan, Jennifer	Student, Ramapo College	89
Kelly, John	Entergy (retired Director of Licensing)	90
Ketchum, Arleen		91
Klein, Tom	Boilermakers Local 5	92
Knolmayer, Liz	Student, Ramapo College	93
Knubel, James	New York AREA	94
Koldewyn, Kennis		95
Kopec, Eileen	Student, Ramapo College	96
Kopshaw, Kaitlin	Student, Ramapo College	97
Kourie, Kathleen	Resident, Garrison	98
Kremer, Arthur	NY AREA (Affordable Reliable Energy Alliance)	99

Commenter	Affiliation (if stated)	Commenter ID Number
Lapido, Helen	Resident, Cortlandt Manor	100
Ledwith, Robert	Metallic Lathers Union and Reinforcing Ironworkers Local 46	101
Lee, Michel	Council on Intelligent Energy and Conservation Policy	102
Leifer, Susan	Sierra Club	103
Likes, Philip		104
Ludwigson, Steve	Boilermakers Local 5	105
Mallon, Sister Florence		106
Mangano, Joe	Radiation and Public Health Project	107
Marzullo, Dominic	Indian Point	108
Mattis, John	Resident, Cortlandt	109
Maturo, Michael	Orangetown Councilman	110
McCann, Dr. Daniel	Superintendent, Hendrick Hudson School District	111
McCormick, John	(enter for Environment Commerce and Energy)	112
McDonald, Norris	(enter for Environment Commerce and Energy)	113
McGrath, John	Easter Seals, New York	114
Miranda, George	New York Teamsters Joint Council 16	115
Miranda, Rick	Brooklyn Hispanic Chamber of Commerce	116
Mitchell, Grace	Resident, Lower Hudson Valley	117
Montague, Virginia	NY Coalition of 100 Black Women	118
Mooney, William	Westchester County Association	119
Moore, Dr. Patrick	Greenspirit Strategies, LLC	120
Murdock, Chad		121
Murphy, Regina		122
Musegaas, Phillip	Riverkeeper	123
Myslinski, Melissa		124
Nemeczek, Jessica	Student, Ramapo College	125
Newman, Janet	West Branch Conservation Association	126
Nicklas, Donald	Local 7	127
NYSDEC	Joan Leary Matthews, John L. Parker	128
NYSO of the Attorney General	Janice A. Dean, John Sipos, Lisa Feiner	129
Oros, George	Westchester County Board of Legislators	130
Otis, Mike	Professor, University	131
Parker, John	NYSDEC Attorney, Region 3	132
Perry, Sharonee	Former Brooklyn Community Board	133

Commenter	Affiliation (if stated)	Commenter ID Number
Perry, Donzella	Resident, Brooklyn	134
Pilder, Leslie		135
Pockriss, Peter	Director of Development for Historic Hudson Valley	136
Puglisi, Linda	Supervisor, Town of Cortlandt	137
Race, Kira	Student, Ramapo College	138
Raddant, Andrew	U.S. Department of the Interior, Regional Environment Officer	139
Riverkeeper, Inc.	Phillip Musegaas, Victor Tafur, Deborah Brancato	140
ROAR		141
Rogers, Sister Mary Christine		142
Rosenfeld, Alice	Resident, Westchester County	143
Ryan, Thomas	Boilermakers Local 5	144
Ryan, Martyn	Resident, Rockland County	145
Safian, Keith	Phelps Memorial Hospital	146
Sambrook, Andrea	Resident, Mamaroneck	147
Samuels, Al	Rockland Business Association	148
Scarola, Julianne	Student, Ramapo College	149
Seeger, Bob	Millwright and Machinery Erectors Local Union No. 740	150
Seeman, Laurie		151
Shapiro, Susan	Sierra Club	152
Shaw, Gary		153
Shepard, Margo	Westchester Citizens Awareness Network	154
Sherman, Andrea	Resident, White Plains	155
Skanes, Brian	Westchester Community Association	156
Slevin, James	Utility Workers Local 1-2	157
Smith, Rev. George Robeson	Mother AME Mount Zion Church in Harlem	158
Smith, Carol	Orange County Chamber of Commerce	159
Sorbello, Dino		160
Starke, Alexis	Resident, Hudson Valley	161
Sullivan, John		162
Swertfager, Diane	Hendrick Hudson H.S.	163
Taormino, Michelle	Student, Ramapo College	164
Tompkins, Dana	Green Infrastructure LLC	165
Tracey, Michael	International Association of Heat & Frost Insulators &	166

Commenter	Affiliation (if stated)	Commenter ID Number
	Allied Workers Local Union 91	
Unknown (Sister Anne ?)		167
Various Authors		168
Vitale, Paul	Business Council of Westchester	169
Walsh, Marion		170
Waltzer, Rosemary		171
Wanshel, Jeff		172
Warren, Roxanne		173
Weininger, Ellen	Resident, White Plains	174
Weininger, Annette		175
Weinstein, Dava		176
Wilson, Craig	SHARE	177
Withrow, Leigh		178
Wolf, Peter		179
Wood, Patti	Grassroots Environmental Education	180
Yanofsky, John	Paramount Center for the Arts	181
Yarme, Judith		182
Yaroscak-Lanzotti, Helen	Resident, Yorktown Heights	183

1
2

Table A-2. Technical Issue Categories. Comments were divided into one of the 28 categories below, each of which has a unique abbreviation code.

Abbreviation Code	Technical Issue	Abbreviation Code	Technical Issue
AE	Aquatic Ecology	OM	Operational Maintenance
AL	Alternatives	ON	Opposition to Nuclear
AM	Aging Management	OP	Operational Safety
AS	Aesthetics	OR	Opposition to Relicensing
AQ	Air Quality	OS	Out of Scope
CI	Cumulative Impacts	PA	Postulated Accidents
CR	Cultural Resources	PS	Psycho-Social Effects
DC	Decommissioning/Deregulation	RE	Remediation
DE	Demographics	RG	Regulatory
EC	Energy Costs/Energy Needs	RI	Radiological Impacts
ED	Editorial	RF	Refurbishment
EJ	Environmental Justice	RW	Radiological Waste Management
EP	Emergency Preparedness	SA	Safety
GE	GEIS	SE	Support for Entergy
GI	General Environmental Impacts	SF	Spent Fuel Pool
GL	Global Warming	SM	SAMA
GW	Ground Water	SO	Socioeconomics
HH	Human Health Issues	SR	Support for Relicense
LE	Leaks	ST	Security & Terrorism
LR	License Renewal and its Process	TE	Terrestrial Ecology
LU	Land Use	TL	Transmission Lines
MP	Monitoring Programs	TS	Threatened and Endangered Species
NE	NEPA	UF	Uranium Fuel Cycle
		WA	Water Use and Quality

Table A-3. Comments Received during Scoping Period. Comments are listed alphabetically by commenter, and each comment has a unique comment identification code.

Comment ID	Commenter	Comment Source[(a)]	Comment Page No(s).	ADAMS Accession Number
1-a-EC/SO/SR	Adams, K.	transcript	176	ML091410355
1-b-EC/SE	Adams, K.	transcript	176	ML091410355
1-c-EC/SO	Adams, K.	transcript	178	ML091410355
1-d-AQ/EC	Adams, K.	transcript	178	ML091410355
1-e-SR	Adams, K.	transcript	180	ML091410355
2-a-AL/RI	Allen, J.	transcript	181	ML091410354
2-b-HH/RI	Allen, J.	transcript	181	ML091410354
2-c-HH	Allen, J.	e-mail	184	ML090640367
3-a-AE/LE/LR	American Citizen	e-mail	186	ML090650458
4-a-AE/LR	Anders, F.	e-mail	187	ML090771329
4-b-AL/LR	Anders, F.	e-mail	188	ML090771329
4-c-LR/SF	Anders, F.	e-mail	189	ML090771329
4-d-CI/LR/SO	Anders, F.	e-mail	189	ML090771329
4-e-LR	Anders, F.	e-mail	190	ML090771329
5-a-AQ/SR	Anthony, Rev. Dr. C.	transcript	191	ML091410354
5-b-AQ/SR	Anthony, Rev. Dr. C.	transcript	192	ML091410354
5-c-AQ/SR	Anthony, Rev. Dr. C.	transcript	192	ML091410354
6-a-EP/OR	Argintar, H.	e-mail	193	ML090700173
7-a-SE/SL	Ball, G.	e-mail	194	ML090640373
7-b-AL	Ball, G.	e-mail	194	ML090640373
7-c-SO	Ball, G.	e-mail	194	ML090640373
7-d-AQ/EC/SR	Ball, G.	e-mail	194	ML090640373
7-e-SR	Ball, G.	e-mail	194	ML090640373
8-a-SR	Banfield, W.	e-mail	196	ML090700180
8-b-SO	Banfield, W.	e-mail	196	ML090700180
8-c-AQ/HH/SO	Banfield, W.	e-mail	196	ML090700180
8-d-SE/SR	Banfield, W.	e-mail	196	ML090700180
9-a-GI	Bard Center for Environmental Policy	e-mail	197	ML090771343
9-b-OR/SA	Bard Center for Environmental Policy	e-mail	198	ML090771343
9-c-LE/PA/RW	Bard Center for Environmental Policy	e-mail	198	ML090771343
9-d-EP	Bard Center for Environmental Policy	e-mail	198	ML090771343
9-e-AE/AL	Bard Center for Environmental Policy	e-mail	198	ML090771343
9-f-AL	Bard Center for Environmental Policy	e-mail	198	ML090771343
9-g-AL/SO	Bard Center for Environmental Policy	e-mail	199	ML090771343
9-h-AE/AL/AQ	Bard Center for	e-mail	199	ML090771343

Comment ID	Commenter	Comment Source[(a)]	Comment Page No(s).	ADAMS Accession Number
	Environmental Policy			
9-i-AL/ED	Bard Center for Environmental Policy	e-mail	200	ML090771343
9-j-AL/ED	Bard Center for Environmental Policy	e-mail	202	ML090771343
10-a-PA	Barthelme, M.	transcript	204	ML091410355
10-b-AL	Barthelme, M.	transcript	204	ML091410355
10-c-GL	Barthelme, M.	transcript	204	ML091410355
10-d-PA	Barthelme, M.	e-mail	205	ML090720661
11-a-OR	Bartholomew, A.	e-mail	207	ML090650248
11-b-AE	Bartholomew, A.	e-mail	207	ML090650248
11-c-AE	Bartholomew, A.	e-mail	207	ML090650248
11-d-LE	Bartholomew, A.	e-mail	207	ML090650248
11-e-RW/ST	Bartholomew, A.	e-mail	207	ML090650248
11-f-AL/OR	Bartholomew, A.	e-mail	207	ML090650248
12-a-OR	Bassi, L.	e-mail	208	ML090700181
12-b-AE	Bassi, L.	e-mail	208	ML090700181
12-c-AE	Bassi, L.	e-mail	208	ML090700181
12-d-LE	Bassi, L.	e-mail	208	ML090700181
12-e-RW/ST	Bassi, L.	e-mail	208	ML090700181
12-f-AL	Bassi, L.	e-mail	208	ML090700181
13-a-OR	Berasi, P.	e-mail	209	ML090720667
13-b-AE	Berasi, P.	e-mail	209	ML090720667
13-c-PA/SF/ST	Berasi, P.	e-mail	209	ML090720667
13-d-PA/SF	Berasi, P.	e-mail	209	ML090720667
13-e-RW/UF	Berasi, P.	e-mail	209	ML090720667
13-f-AM/GE/OM	Berasi, P.	e-mail	209	ML090720667
13-g-DE/EP	Berasi, P.	e-mail	209	ML090720667
13-h-OR	Berasi, P.	e-mail	210	ML090720667
13-i-OR	Berasi, P.	e-mail	210	ML090720667
14-a-AQ/EJ/SR	Bigby, D.	hand-in	212	ML091740490
14-b-AQ/EJ/SR	Bigby, D.	hand-in	213	ML091740490
14-c-AL/AQ	Bigby, D.	hand-in	214	ML091740490
14-d-AL/EJ/GL	Bigby, D.	hand-in	214	ML091740490
14-e-SR	Bigby, D.	hand-in	216	ML091740490
15-a-OR	Bittermann, Sister R.	letter	217	ML090860661
16-a-DE/PA	Blades, A.	e-mail	218	ML090720679
16-b-PS/ST	Blades, A.	e-mail	218	ML090720679
16-c-EP/PA/PS	Blades, A.	e-mail	218	ML090720679
16-d-LR	Blades, A.	e-mail	219	ML090720679
17-a-NE/SF	Blumenthal, R.	e-mail	221	ML090720677

Comment ID	Commenter	Comment Source[(a)]	Comment Page No(s).	ADAMS Accession Number
				ML090820081
17-b-EP/ST	Blumenthal, R.	e-mail	221	ML090720677
				ML090820081
17-c-NE	Blumenthal, R.	e-mail	222	ML090720677
				ML090820081
17-d-DE	Blumenthal, R.	e-mail	224	ML090720677
				ML090820081
17-e-NE/PA	Blumenthal, R.	e-mail	225	ML090720677
				ML090820081
17-f-PA	Blumenthal, R.	e-mail	225	ML090720677
				ML090820081
17-g-ST	Blumenthal, R.	e-mail	226	ML090720677
				ML090820081
17-h-SF	Blumenthal, R.	e-mail	227	ML090720677
				ML090820081
17-i-SF/ST	Blumenthal, R.	e-mail	227	ML090720677
				ML090820081
17-j-SF	Blumenthal, R.	e-mail	227	ML090720677
				ML090820081
17-k-SF/ST	Blumenthal, R.	e-mail	228	ML090720677
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17-l-SF/ST	Blumenthal, R.	e-mail	229	ML090720677
				ML090820081
17-m-EP	Blumenthal, R.	e-mail	230	ML090720677
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17-n-EP/PA/ST	Blumenthal, R.	e-mail	230	ML090720677
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17-o-AE/NE	Blumenthal, R.	e-mail	231	ML090720677
				ML090820081
17-p-EP/PA/RI	Blumenthal, R.	e-mail	232	ML090720677
				ML090820081
17-q-AE/NE	Blumenthal, R.	e-mail	233	ML090720677
				ML090820081
17-r-EP/GI/RI	Blumenthal, R.	e-mail	234	ML090720677
				ML090820081
18-a-LE/OR	Boorman, L.	e-mail	235	ML090720666
18-b-DE/ST	Boorman, L.	e-mail	235	ML090720666
18-c-AE	Boorman, L.	e-mail	235	ML090720666
18-d-OR	Boorman, L.	e-mail	235	ML090720666
19-a-EC/SR	Bowman, R.	transcript	236	ML091410354
19-b-EC/SO/SR	Bowman, R.	transcript	237	ML091410354
19-c-EC/SO/SR	Bowman, R.	transcript	238	ML091410354

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20-a-PA/SF/ST	Brancato, D.	transcript	239	ML091410354
20-b-HH	Brancato, D.	transcript	239	ML091410354
20-c-AE/OR	Brancato, D.	transcript	240	ML091410354
21-a-AE/OR/SF	Brennan, C.	e-mail	242	ML090640369
21-b-GI/OR	Brennan, C.	e-mail	242	ML090640369
22-a-HH/OR/PA	Bron, G.	e-mail	243	ML090700171
23-a-SE/SR	Burruss, M.	transcript	244	ML091410355
23-b-SO	Burruss, M.	transcript	244	ML091410355
23-c-AL/AQ	Burruss, M.	transcript	244	ML091410355
23-d-EC	Burruss, M.	transcript	244	ML091410355
23-e-AQ	Burruss, M.	transcript	245	ML091410355
23-f-EC/SO	Burruss, M.	transcript	245	ML091410355
23-g-SR	Burruss, M.	transcript	246	ML091410355
23-h-AL/AQ	Burruss, M.	hand-in	247	ML091740490
23-i-EC/SO/SR	Burruss, M.	hand-in	247	ML091740490
24-a-HH/OR/RI	Burton, N.	transcript	248	ML091410354
24-b-HH/OR/RI	Burton, N.	hand-in	251	ML091740490
25-a-OR	Butler, E.	e-mail	255	ML090720676
26-a-EC/LR	Byrd, R.	transcript	256	ML091410354
26-b-OP	Byrd, R.	transcript	257	ML091410354
26-c-EC/SO/SR	Byrd, R.	transcript	258	ML091410354
27-a-OR	Calvani, D.	e-mail	259	ML090700183
27-b-AE	Calvani, D.	e-mail	259	ML090700183
27-c-AE	Calvani, D.	e-mail	259	ML090700183
27-d-LE	Calvani, D.	e-mail	259	ML090700183
27-e-SF/ST	Calvani, D.	e-mail	259	ML090700183
27-f-OR	Calvani, D.	e-mail	259	ML090700183
28-a-EC/SR	Campbell, J.	transcript	260	ML091410354
28-b-EC/SO	Campbell, J.	transcript	260	ML091410354
29-a-SO/SR	Capurso, T.	transcript	262	ML091410355
29-b-OP	Capurso, T.	transcript	262	ML091410355
29-c-EC/SA	Capurso, T.	transcript	262	ML091410355
30-a-AL/AQ/AS/ EJ/GE	Carmody, G.	e-mail	265	ML090700187
31-a-EJ/SR	Castro, M.	transcript	266	ML091410355
31-b-EC/EJ/HH	Castro, M.	transcript	266	ML091410355
31-c-AQ/SR	Castro, M.	transcript	266	ML091410355
32-a-AM/OP/PA	Chernoff, P.	e-mail	268	ML090640374
33-a-AE/GL/LE	Clark, P.	e-mail	269	ML090640400
34-a-AL/EC	Clegg, T.	transcript	270	ML091410355
34-b-AL/EC	Clegg, T.	transcript	270	ML091410355
35-a-LE/OM	Cohen, L.	e-mail	272	ML909640370

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35-b-EP	Cohen, L.	e-mail	272	ML909640370
35-c-AM/RW	Cohen, L.	e-mail	272	ML909640370
35-d-OR	Cohen, L.	e-mail	272	ML909640370
35-e-OR/RE	Cohen, L.	e-mail	272	ML909640370
36-a-SR	Connolly, J.	transcript	273	ML091410355
36-b-OP	Connolly, J.	transcript	273	ML091410355
36-c-AL/AQ/EC	Connolly, J.	transcript	274	ML091410355
36-d-OP/SO	Connolly, J.	transcript	274	ML091410355
36-e-OP/SO	Connolly, J.	transcript	275	ML091410355
37-a-AE/OR	Cooper, L.	letter	276	ML091100401
37-b-LE/SF/ST	Cooper, L.	letter	276	ML091100401
38-a-ON	Cypser, B.	transcript	277	ML091410354
38-b-PA/RW/ST	Cypser, B.	e-mail	278	ML090640364
38-c-RW/SF/ST	Cypser, B.	e-mail	278	ML090640364
38-d-AL	Cypser, B.	e-mail	278	ML090640364
38-e-RW/SF	Cypser, B.	e-mail	278	ML090640364
38-f-RW/SF	Cypser, B.	hand-in	279	ML091740490
38-g-RW	Cypser, B.	hand-in	279	ML091740490
38-h-ST	Cypser, B.	hand-in	279	ML091740490
38-i-RW	Cypser, B.	hand-in	279	ML091740490
39-a-RW/SF	Cypser, R.	transcript	280	ML091410355
39-b-LE	Cypser, R.	transcript	280	ML091410355
39-c-PA/ST	Cypser, R.	transcript	280	ML091410355
39-d-PA/ST	Cypser, R.	transcript	281	ML091410355
40-a-SR	Dacimo, F.	transcript	282	ML091410355
40-b-AE	Dacimo, F.	transcript	282	ML091410355
40-c-AE	Dacimo, F.	transcript	283	ML091410355
40-d-AE	Dacimo, F.	transcript	284	ML091410355
40-e-AE	Dacimo, F.	transcript	284	ML091410355
40-f-AE	Dacimo, F.	transcript	284	ML091410355
40-g-EC	Dacimo, F.	transcript	285	ML091410355
40-h-SR	Dacimo, F.	email	286	ML091040133
40-i-OS	Dacimo, F.	email	287	ML091040133
40-j-AE/AL	Dacimo, F.	email	287	ML091040133
40-k-AE	Dacimo, F.	email	292	ML091040133
40-l-ED	Dacimo, F.	email	292	ML091040133
40-m-ED	Dacimo, F.	email	292	ML091040133
40-n-AE/ED	Dacimo, F.	email	292	ML091040133
40-o-ED/RG	Dacimo, F.	email	292	ML091040133
40-p-AE	Dacimo, F.	email	293	ML091040133
40-q-AE	Dacimo, F.	email	293	ML091040133
40-r-AE	Dacimo, F.	email	294	ML091040133

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40-s-AE	Dacimo, F.	email	294	ML091040133
40-t-AE/ED	Dacimo, F.	email	295	ML091040133
40-u-ED/TS	Dacimo, F.	email	295	ML091040133
40-v-AL/TS	Dacimo, F.	email	295	ML091040133
40-x-ED	Dacimo, F.	email	296	ML091040133
40-y-AE	Dacimo, F.	email	296	ML091040133
40-z-AE	Dacimo, F.	email	296	ML091040133
40-aa-ED	Dacimo, F.	email	296	ML091040133
40-bb-AE/ED	Dacimo, F.	email	296	ML091040133
40-cc-AE/ED	Dacimo, F.	email	298	ML091040133
40-dd-AE/AL	Dacimo, F.	email	298	ML091040133
40-ee-AE	Dacimo, F.	email	299	ML091040133
40-ff-AE/ED	Dacimo, F.	email	299	ML091040133
40-gg-AE	Dacimo, F.	email	299	ML091040133
40-hh-AE	Dacimo, F.	email	300	ML091040133
40-ii-AE/AL/TS	Dacimo, F.	email	300	ML091040133
40-jj-AE	Dacimo, F.	email	301	ML091040133
40-kk-AE/ED	Dacimo, F.	email	301	ML091040133
40-ll-AE	Dacimo, F.	email	301	ML091040133
40-mm-AE/ED	Dacimo, F.	email	302	ML091040133
40-nn-AE	Dacimo, F.	email	302	ML091040133
40-oo-AE	Dacimo, F.	email	303	ML091040133
40-pp-AL	Dacimo, F.	email	303	ML091040133
40-qq-AE/ED	Dacimo, F.	email	303	ML091040133
40-rr-AE/ED/TL	Dacimo, F.	email	303	ML091040133
40-ss-ED	Dacimo, F.	email	304	ML091040133
40-tt-AE	Dacimo, F.	email	304	ML091040133
40-uu-AE	Dacimo, F.	email	305	ML091040133
40-vv-ED	Dacimo, F.	email	305	ML091040133
40-ww-ED/SM	Dacimo, F.	email	305	ML091040133
40-xx-AL/AQ	Dacimo, F.	email	306	ML091040133
40-yy-ED	Dacimo, F.	email	306	ML091040133
40-zz-AL	Dacimo, F.	email	307	ML091040133
40-aaa-AE/AL	Dacimo, F.	email	309	ML091040133
40-bbb-AL	Dacimo, F.	email	310	ML091040133
40-ccc-AL/TE	Dacimo, F.	email	311	ML091040133
40-ddd-AL/TS	Dacimo, F.	email	312	ML091040133
40-eee-AL/AQ	Dacimo, F.	email	312	ML091040133
40-fff-AL/AQ	Dacimo, F.	email	313	ML091040133
40-ggg-AL	Dacimo, F.	email	313	ML091040133
40-hhh-AL/ED	Dacimo, F.	email	315	ML091040133
40-iii-ED	Dacimo, F.	email	316	ML091040133
40-jjj- AE	Dacimo, F.	email	318	ML091040133

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40-kkk-AL	Dacimo, F.	email	318	ML091040133
40-lll-ED/SM	Dacimo, F.	email	318	ML091040133
40-mmm-AE	Dacimo, F.	email	320	ML091040133
40-nnn-AE	Dacimo, F.	email	324	ML091040133
40-ooo-AE/ED	Dacimo, F.	email	324	ML091040133
40-ppp-AE/CE	Dacimo, F.	email	325	ML091040133
40-qqq-AE	Dacimo, F.	email	328	ML091040133
40-rrr-AL	Dacimo, F.	email	341	ML091040133
40-sss-AL	Dacimo, F.	email	344	ML091040133
40-ttt-AE	Dacimo, F.	email	347	ML091040133
40-uuu-AE	Dacimo, F.	email	348	ML091040133
40-vvv-AE	Dacimo, F.	email	348	ML091040133
40-www-AL	Dacimo, F.	email	348	ML091040133
40-xxx-AE/ED	Dacimo, F.	email	349	ML091040133
40-yyy-AE	Dacimo, F.	email	349	ML091040133
40-zzz-AE	Dacimo, F.	email	350	ML091040133
40-aaaa-TS	Dacimo, F.	email	350	ML091040133
40-bbbb-TS	Dacimo, F.	email	351	ML091040133
40-cccc-TS	Dacimo, F.	email	352	ML091040133
40-dddd-TS	Dacimo, F.	email	352	ML091040133
40-eeee-AE	Dacimo, F.	email	353	ML091040133
40-ffff-AE	Dacimo, F.	email	353	ML091040133
40-gggg-AL	Dacimo, F.	email	367	ML091040133
40-hhhh-AL	Dacimo, F.	email	370	ML091040133
40-iiii-AL	Dacimo, F.	email	374	ML091040133
40-jjjj-AL	Dacimo, F.	email	377	ML091040133
40-kkkk-AL	Dacimo, F.	email	382	ML091040133
40-llll-AL	Dacimo, F.	email	384	ML091040133
40-mmmm-AL	Dacimo, F.	email	387	ML091040133
40-nnnn-AL	Dacimo, F.	email	390	ML091040133
40-oooo-AL	Dacimo, F.	email	428	ML091040133
40-pppp-AL	Dacimo, F.	email	435	ML091040133
40-qqqq-AE	Dacimo, F.	email	442	ML091040133
40-rrrr-AE	Dacimo, F.	email	457	ML091040133
40-ssss-AE	Dacimo, F.	email	459	ML091040133
40-tttt-AE	Dacimo, F.	email	461	ML091040133
40-uuuu-AE	Dacimo, F.	email	463	ML091040133
40-vvvv-AE	Dacimo, F.	email	471	ML091040133
40-wwww-AE	Dacimo, F.	email	472	ML091040133
40-xxxx-AE	Dacimo, F.	email	475	ML091040133
40-yyyy-AE	Dacimo, F.	email	476	ML091040133
40-zzzz-AE	Dacimo, F.	email	479	ML091040133
40-aaaaa-AE	Dacimo, F.	email	480	ML091040133

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40-bbbbb-AE	Dacimo, F.	email	480	ML091040133
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40-ddddd-AE	Dacimo, F.	email	482	ML091040133
40-eeeee-AE	Dacimo, F.	email	482	ML091040133
40-fffff-AE	Dacimo, F.	email	483	ML091040133
40-ggggg-AE	Dacimo, F.	email	483	ML091040133
40-hhhhh-AE	Dacimo, F.	email	483	ML091040133
40-iiiii-AE	Dacimo, F.	email	485	ML091040133
40-jjjjj-AE	Dacimo, F.	email	487	ML091040133
40-kkkkk-AE	Dacimo, F.	email	489	ML091040133
40-lllll-AE	Dacimo, F.	email	495	ML091040133
40-mmmmm-AE	Dacimo, F.	email	513	ML091040133
40-nnnnn-TS	Dacimo, F.	email	513	ML091040133
40-ooooo-TS	Dacimo, F.	email	515	ML091040133
40-ppppp-AE	Dacimo, F.	email	523	ML091040133
40-qqqqq-AE	Dacimo, F.	email	525	ML091040133
40-rrrrr-AE	Dacimo, F.	email	533	ML091040133
40-sssss-AE	Dacimo, F.	email	538	ML091040133
40-ttttt-AE	Dacimo, F.	email	553	ML091040133
40-uuuuu-AE	Dacimo, F.	email	574	ML091040133
40-vvvvv-AE	Dacimo, F.	email	577	ML091040133
40-wwwww-GE/LR	Dacimo, F.	hand-in	595	ML091740490
40-xxxxx-SE	Dacimo, F.	hand-in	596	ML091740490
40-yyyyy-AE	Dacimo, F.	hand-in	596	ML091740490
40-zzzzz-AE	Dacimo, F.	hand-in	596	ML091740490
40-aaaaaa-AE	Dacimo, F.	hand-in	597	ML091740490
40-bbbbbb-AE	Dacimo, F.	hand-in	600	ML091740490
40-cccccc-AL/RG	Dacimo, F.	hand-in	601	ML091740490
41-a-OR	Daly, Mary A.	letter	604	ML090860664
41-b-AM/SF	Daly, Mary A.	letter	604	ML090860664
41-c-AE/LE	Daly, Mary A.	letter	604	ML090860664
41-d-AL	Daly, Mary A.	letter	604	ML090860664
42-a-EC/SR	Davis, D.	transcript	605	ML091410354
42-b-EC/SO	Davis, D.	transcript	605	ML091410354
42-c-HH	Davis, D.	transcript	605	ML091410354
42-d-SE/SR	Davis, D.	transcript	605	ML091410354
42-e-SR	Davis, D.	hand-in	607	ML091740490
42-f-EC/SO	Davis, D.	hand-in	607	ML091740490
42-g-AL/AQ	Davis, D.	hand-in	607	ML091740490
42-h-SE/SL	Davis, D.	hand-in	607	ML091740490
43-a-SE/SO	Davis, J.	hand-in	608	ML091740490
44-a-OR	DeAngelo, C.	e-mail	610	ML090771348

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				ML090860663
44-b-AM/DE/SF	DeAngelo, C.	e-mail	610	ML090771348
				ML090860663
44-c-AE/LE	DeAngelo, C.	e-mail	610	ML090771348
				ML090860663
44-d-OR	DeAngelo, C.	e-mail	610	ML090771348
				ML090860663
45-a-AQ/EJ	Degraff, Rev. Jacques	transcript	611	ML091410354
45-b-AL/EC/EJ	Degraff, Rev. Jacques	transcript	612	ML091410354
45-c-LR	Degraff, Rev. Jacques	transcript	612	ML091410354
46-a-EC/SR	Digby, D.	transcript	614	ML091410355
46-b-AQ/EJ	Digby, D.	transcript	614	ML091410355
46-c-AL/EJ/SR	Digby, D.	transcript	615	ML091410355
47-a-SF	DiRocco, S.	e-mail	616	ML090771334
47-b- LE/EP/SF	DiRocco, S.	e-mail	616	ML090771334
47-c-RW	DiRocco, S.	e-mail	616	ML090771334
48-a-OP	Donahue, Mayor A.	transcript	617	ML091410354
48-b-EC/SO	Donahue, Mayor A.	transcript	617	ML091410354
48-c-SE/SO	Donahue, Mayor A.	transcript	618	ML091410354
48-d-AQ/SO	Donahue, Mayor A.	transcript	618	ML091410354
48-e-OP/SR	Donahue, Mayor A.	transcript	619	ML091410354
48-f-SE	Donahue, Mayor A.	transcript	619	ML091410354
48-g-AQ/SO	Donahue, Mayor A.	transcript	620	ML091410354
49-a-SR	Durett, D.	transcript	621	ML091410354
49-b-AQ/EJ	Durett, D.	transcript	622	ML091410354
49-c-LR/SR	Durett, D.	transcript	622	ML091410354
49-d-AQ/EJ/SR	Durett, D.	hand-in	625	ML091740490
49-e-AL/EJ	Durett, D.	hand-in	626	ML091740490
49-f-AQ/EJ	Durett, D.	hand-in	628	ML091740490
49-g-AL/AQ/EJ	Durett, D.	hand-in	630	ML091740490
49-h-AQ/EC	Durett, D.	hand-in	632	ML091740490
49-i-SR	Durett, D.	hand-in	633	ML091740490
50-a-LR	Edelstein, M.	transcript	634	ML091410355
50-b-DE/PA	Edelstein, M.	transcript	635	ML091410355

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50-c-PA	Edelstein, M.	transcript	636	ML091410355
50-d-EP/HH	Edelstein, M.	transcript	636	ML091410355
50-e-NE	Edelstein, M.	transcript	637	ML091410355
50-f-NE	Edelstein, M.	e-mail	639	ML090700188
50-g-GE/SF	Edelstein, M.	e-mail	639	ML090700188
50-h-DE/PA	Edelstein, M.	e-mail	639	ML090700188
50-i-EJ/LE	Edelstein, M.	e-mail	640	ML090700188
50-j-EJ/PA	Edelstein, M.	e-mail	640	ML090700188
50-k-PA	Edelstein, M.	e-mail	640	ML090700188
50-l-HH/PA	Edelstein, M.	e-mail	641	ML090700188
50-m-PA/ST	Edelstein, M.	e-mail	641	ML090700188
50-n-RW/SF	Edelstein, M.	e-mail	641	ML090700188
50-o-HH/LE/PA	Edelstein, M.	e-mail	641	ML090700188
50-p-DE/EP/NE	Edelstein, M.	e-mail	642	ML090700188
50-q-DE/EP	Edelstein, M.	e-mail	642	ML090700188
50-r-EP/PS	Edelstein, M.	e-mail	643	ML090700188
50-s-SO	Edelstein, M.	e-mail	643	ML090700188
50-t-EJ	Edelstein, M.	e-mail	643	ML090700188
50-u-GL/UF	Edelstein, M.	e-mail	644	ML090700188
51-a-HH/PA/UF	Evans, L.	transcript	645	ML091410355
51-b-AL	Evans, L.	transcript	645	ML091410355
51-c-AL	Evans, L.	transcript	645	ML091410355
52-a-SA	Falciano, P.	transcript	647	ML091410355
52-b-ST	Falciano, P.	transcript	647	ML091410355
52-c-AL/AQ/EC	Falciano, P.	transcript	648	ML091410355
52-d-AL	Falciano, P.	transcript	648	ML091410355
52-e-SR	Falciano, P.	transcript	649	ML091410355
53-a-SE/SR	Federspiel, J.	transcript	650	ML091410354
54-a-LE/OR/RW/SF	Feinberg, J.	e-mail	652	ML090720670
54-b-DE/ST	Feinberg, J.	e-mail	652	ML090720670
54-c-AE	Feinberg, J.	e-mail	652	ML090720670
54-d-OR	Feinberg, J.	e-mail	652	ML090720670
55-a-OS	Filippelli, J.	letter	653	ML090860878
55-b-AE/RG	Filippelli, J.	letter	654	ML090860878
55-c-RW	Filippelli, J.	letter	654	ML090860878
55-d-SM	Filippelli, J.	letter	654	ML090860878
55-e-PA	Filippelli, J.	letter	654	ML090860878
55-f-AE/PA/RW	Filippelli, J.	letter	655	ML090860878
56-a-AL/AQ/EC	Fitzpatrick, B.	e-mail	656	ML090700182
56-b-SO	Fitzpatrick, B.	e-mail	656	ML090700182
56-c-HH	Fitzpatrick, B.	e-mail	657	ML090700182
56-d-EP	Fitzpatrick, B.	e-mail	657	ML090700182

Comment ID	Commenter	Comment Source[(a)]	Comment Page No(s).	ADAMS Accession Number
56-e-SE	Fitzpatrick, B.	e-mail	657	ML090700182
56-f-AL/SA	Fitzpatrick, B.	e-mail	657	ML090700182
57-a-SA	Forehand, R.	transcript	658	ML091410355
57-b-AQ/EC/SO	Forehand, R.	transcript	658	ML091410355
57-c-SA/SE/SO	Forehand, R.	transcript	659	ML091410355
57-d-SL	Forehand, R.	letter	660	ML090700172
57-e-EC/OP/SO	Forehand, R.	letter	660	ML091680295
57-f-AL/AQ	Forehand, R.	letter	660	ML091680295
57-g-SR	Forehand, R.	letter	660	ML091680295
57-h-SE/SR	Forehand, R.	letter	660	ML091680295
58-a-SR	Form Letter	letter	661	ML091100591
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Comment ID	Commenter	Comment Source[(a)]	Comment Page No(s).	ADAMS Accession Number
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58-b-AL/AQ/EJ	Form Letter	letter	661	ML091100591
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Comment ID	Commenter	Comment Source[(a)]	Comment Page No(s).	ADAMS Accession Number
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58-c-AQ/EC/SO	Form Letter	letter	661	ML091100591
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Comment ID	Commenter	Comment Source[(a)]	Comment Page No(s).	ADAMS Accession Number
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58-d-SR	Form Letter	letter	661	ML091100591
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59-a-LR	Foster, Mary	transcript	662	ML091410355
60-a-SE	Fraiser, A.	transcript	665	ML091410354
60-b-AQ/SE	Fraiser, A.	transcript	666	ML091410354
61-a-AE/AL/OR	Friedman, C.	e-mail	668	ML090640398
61-b-LE/RW/ST	Friedman, C.	e-mail	668	ML090640398
62-a-EJ/SR	Frye, G.	transcript	669	ML091410355
62-b-EJ/SR	Frye, G.	transcript	669	ML091410355
63-a-OR	Funck, J.	e-mail, letter	671	ML090640355
				ML090711021
63-b-RW	Funck, J.	e-mail, letter	671	ML090640355
				ML090711021
63-c-AE	Funck, J.	e-mail, letter	671	ML090640355
				ML090711021
63-d-LE	Funck, J.	e-mail, letter	671	ML090640355
				ML090711021
63-e-AM	Funck, J.	e-mail, letter	671	ML090640355
				ML090711021
63-f-RW/ST	Funck, J.	e-mail, letter	671	ML090640355
				ML090711021
63-g-OR	Funck, J.	e-mail, letter	672	ML090640355
				ML090711021
64-a-LE/OM/OR/RW	Furgatch, L.	e-mail	673	ML090640376
65-a-SO/SR	Garcia, F.	transcript	674	ML091410354
65-b-EC/SR	Garcia, F.	transcript	674	ML091410354
65-c-EC/SO/SR	Garcia, F.	transcript	674	ML091410354
66-a-GI/OR	Garisto, M.	e-mail	676	ML090720675
66-b-OE	Garisto, M.	e-mail	676	ML090720675
66-c-RG	Garisto, M.	e-mail	676	ML090720675
67-a-SR	Gordon, M.	e-mail, letter	677	ML090700176
				ML091680298

Comment ID	Commenter	Comment Source[(a)]	Comment Page No(s).	ADAMS Accession Number
67-b-EC/SO	Gordon, M.	e-mail, letter	677	ML090700176 ML091680298
67-c-EC	Gordon, M.	e-mail, letter	677	ML090700176 ML091680298
67-d-AL	Gordon, M.	e-mail, letter	677	ML090700176 ML091680298
67-e-SE/SO	Gordon, M.	e-mail, letter	677	ML090700176 ML091680298
67-f-SR	Gordon, M.	e-mail, letter	677	ML090700176 ML091680298
68-a-AL/NE	Gould, R.	hand-in	678	ML091740490
68-b-DE/EF/NE	Gould, R.	hand-in	678	ML091740490
68-c-DE/EJ/NE	Gould, R.	hand-in	679	ML091740490
68-d-AL	Gould, R.	hand-in	680	ML091740490
69-a-HH/LE/OR/PA	Grady, P.	e-mail	682	ML090700185
70-a-ON	Raging Grannies	transcript, hand-in	683	ML091410355 ML091740490
70-b-UF	Raging Grannies	transcript, hand-in	685	ML091410355 ML091740490
70-c-OR	Raging Grannies	transcript, hand-in	685	ML091410355 ML091740490
70-d-OR	Raging Grannies	transcript, hand-in	687	ML091410355 ML091740490
71-a-OE	Gray, J.	e-mail	691	ML090720680
71-b-PA	Gray, J.	e-mail	691	ML090720680
71-c-LE/RW	Gray, J.	e-mail	691	ML090720680
71-d-RW	Gray, J.	e-mail	691	ML090720680
72-a-EP/LE/OR/RW	Green, G.	e-mail	693	ML090640378
73-a-HH	Greene, M.	transcript	694	ML091410354
73-b-EJ/LE	Greene, M.	transcript	694	ML091410354
73-c-EJ/HH/LE	Greene, M.	transcript	695	ML091410354
73-d-EP	Greene, M.	transcript	695	ML091410354
73-e-EJ/HH	Greene, M.	hand-in	697	ML091740490
73-f-AL/AQ/WA	Greene, M.	hand-in	698	ML091740490
73-g-AE	Greene, M.	hand-in	698	ML091740490
73-h-AM/LR/ST	Greene, M.	hand-in	698	ML091740490
74-a-LE	Hassman, H.	e-mail	699	ML090640394
74-b-SA	Hassman, H.	e-mail	699	ML090640394
75-a-OR	Hawkins, G.	e-mail	700	ML090640393
75-b-EP/LE/OP/ST	Hawkins, G.	e-mail	700	ML090640393

Comment ID	Commenter	Comment Source[(a)]	Comment Page No(s).	ADAMS Accession Number
75-c-EC/SA	Hawkins, G.	e-mail	700	ML090640393
76-a-AE/LE/OR	Helman, L.	e-mail	701	ML090640363
76-b-OR/PA	Helman, L.	e-mail	701	ML090640363
77-a-AE/OR	Hirsh, S.	e-mail	702	ML090640395
78-a-SR	Hohlfeld, B.	transcript	703	ML091410354
78-b-EC/GI/ST	Hohlfeld, B.	transcript	703	ML091410354
78-c-SO/SR	Hohlfeld, B.	transcript	703	ML091410354
79-a-HH	Hudson River Sloop Clearwater, Inc.	hand-in	705	ML091740490
79-b-EJ/HH	Hudson River Sloop Clearwater, Inc.	hand-in	706	ML091740490
79-c-AL	Hudson River Sloop Clearwater, Inc.	hand-in	706	ML091740490
79-d-LR/NE	Hudson River Sloop Clearwater, Inc.	hand-in	706	ML091740490
79-e-HH/SO	Hudson River Sloop Clearwater, Inc.	hand-in	709	ML091740490
79-f-HH	Hudson River Sloop Clearwater, Inc.	hand-in	711	ML091740490
79-g-SO	Hudson River Sloop Clearwater, Inc.	hand-in	711	ML091740490
79-h-EJ	Hudson River Sloop Clearwater, Inc.	hand-in	711	ML091740490
79-i-HH/SO	Hudson River Sloop Clearwater, Inc.	hand-in	711	ML090780770
79-j-HH	Hudson River Sloop Clearwater, Inc.	hand-in	711	ML090780770
79-k-SF	Hudson River Sloop Clearwater, Inc.	hand-in	712	ML090780770
79-l-AE	Hudson River Sloop Clearwater, Inc.	hand-in	712	ML090780770
79-m-AL	Hudson River Sloop Clearwater, Inc.	hand-in	713	ML090780770
79-n-EJ	Hudson River Sloop Clearwater, Inc.	hand-in	714	ML090780770
79-o-EJ	Hudson River Sloop Clearwater, Inc.	hand-in	716	ML090780770
79-p-EJ	Hudson River Sloop Clearwater, Inc.	hand-in	716	ML090780770
79-q-EJ	Hudson River Sloop Clearwater, Inc.	hand-in	718	ML090780770
79-r-EJ	Hudson River Sloop Clearwater, Inc.	hand-in	720	ML090780770
79-s-EJ/HH	Hudson River Sloop Clearwater, Inc.	hand-in	720	ML090780770
79-t-EJ	Hudson River Sloop Clearwater, Inc.	hand-in	721	ML090780770
79-u-EJ/SM	Hudson River Sloop Clearwater, Inc.	hand-in	724	ML090780770
79-v-EJ/EP/SM	Hudson River Sloop Clearwater, Inc.	hand-in	724	ML090780770
79-w-EJ	Hudson River Sloop	hand-in	727	ML090780770

Comment ID	Commenter	Comment Source[(a)]	Comment Page No(s).	ADAMS Accession Number
79-x-AL/EJ	Clearwater, Inc. Hudson River Sloop Clearwater, Inc.	hand-in	728	ML090780770
79-y-EJ/UF	Hudson River Sloop Clearwater, Inc.	hand-in	730	ML090780770
79-z-AL	Hudson River Sloop Clearwater, Inc.	hand-in	731	ML090780770
79-aa-LR	Hudson River Sloop Clearwater, Inc.	hand-in	734	ML090780770
80-a-EP/OR/RW/ST	Imoberdorf, O.	e-mail	736	ML090640366
80-b-LE/RW/SF/ST	Imoberdorf, O.	e-mail	736	ML090640366
80-c-OR	Imoberdorf, O.	e-mail	736	ML090640366
81-a-UF	Indusi, J.	transcript	737	ML091410355
81-b-EC	Indusi, J.	transcript	737	ML091410355
81-c-AL	Indusi, J.	transcript	737	ML091410355
81-d-OR	Indusi, J.	transcript	738	ML091410355
82-a-OR	Jacobs, M.	transcript	739	ML091410354
82-b-GI/LR	Jacobs, M.	transcript	739	ML091410354
82-c-LR	Jacobs, M.	transcript	740	ML091410354
83-a-OS	Johnson, T.	transcript	743	ML091410355
84-a-RW	Karamaty, V.	transcript	744	ML091410354
84-b-OS	Karamaty, V.	transcript	744	ML091410354
84-c-ON	Karamaty, V.	transcript	744	ML091410354
85-a-EC/SO/SR	Karas, J.	transcript	747	ML091410355
85-b-AQ/HH	Karas, J.	transcript	747	ML091410355
85-c-EC/SO/SR	Karas, J.	transcript	747	ML091410355
86-a-OR	Kardos, T.	transcript	749	ML091410354
86-b-AQ	Kardos, T.	transcript	749	ML091410354
86-c-AL	Kardos, T.	transcript	749	ML091410354
86-d-AE/AL/GL	Kardos, T.	transcript	750	ML091410354
86-e-OR	Kardos, T.	transcript	750	ML091410354
87-a-DE/EP	Kardos, Th.	e-mail	751	ML090771342
87-b-HH/PA/RW/ST	Kardos, Th.	e-mail	751	ML090771342
87-c-AM/HH/OM	Kardos, Th.	e-mail	751	ML090771342
87-d-AE	Kardos, Th.	e-mail	751	ML090771342
87-e-GL	Kardos, Th.	e-mail	752	ML090771342
87-f-AL	Kardos, Th.	e-mail	752	ML090771342
88-a-AQ	Kearrey, G.	transcript	753	ML091410355
88-b-EC/SR	Kearney, G.	transcript	753	ML091410355
88-c-EC/SR	Kearney, G.	transcript	753	ML091410355
89-a-HH/PA/SF	Keenan, J.	e-mail	755	ML090720664
90-a-SA	Kelly, J.	transcript	756	ML091410354

Comment ID	Commenter	Comment Source[(a)]	Comment Page No(s).	ADAMS Accession Number
90-b-AQ	Kelly, J.	transcript	756	ML091410354
90-c-AL/AQ/HH	Kelly, J.	transcript	756	ML091410354
90-d-AL/EC/SO	Kelly, J.	transcript	757	ML091410354
90-e-AL/AQ	Kelly, J.	hand-in	759	ML091740490
91-a-OR	Ketchum, A.	e-mail	831	ML090720672
91-b-AE	Ketchum, A.	e-mail	831	ML090720672
91-c-AE	Ketchum, A.	e-mail	831	ML090720672
91-d-LE	Ketchum, A.	e-mail	831	ML090720672
91-e-OR/RW/ST	Ketchum, A.	e-mail	831	ML090720672
92-a-EC/SO/SR	Klein, T.	transcript	832	ML091410355
92-b-EC/SO	Klein, T.	transcript	832	ML091410355
92-c-AL/AQ	Klein, T.	transcript	833	ML091410355
92-d-SO/SR	Klein, T.	transcript	833	ML091410355
92-e-SO/SR	Klein, T.	letter	834	ML091682097
92-f-AL/EC	Klein, T.	letter	834	ML091682097
92-g-SO/SR	Klein, T.	letter	834	ML091682097
93-a-OE	Knolmeter, L.	e-mail	835	ML090720681
93-b-RI/TE	Knolmeter, L.	e-mail	835	ML090720681
93-c-AL/EC	Knolmayer, L.	e-mail	835	ML090720681
93-d-AE/MP/RG	Knolmayer, L.	e-mail	835	ML090720681
93-e-AE/RG	Knolmayer, L.	e-mail	836	ML090720681
93-f-AE	Knolmayer, L.	e-mail	836	ML090720681
93-g-EJ/HH	Knolmayer, L.	e-mail	836	ML090720681
94-a-LR	Knubel, J.	transcript	838	ML091410355
94-b-AE	Knubel, J.	transcript	838	ML091410355
94-c-AL/EC	Knubel, J.	transcript	838	ML091410355
95-a-AL	Koldewyn, K.	e-mail	840	ML090720671
96-a-GE/LR	Kopec, E.	e-mail	842	ML090700186
96-b-LR/NE	Kopec, E.	e-mail	842	ML090700186
96-c-AM/LE/OM	Kopec, E.	e-mail	842	ML090700186
96-d-HH/LE/RI	Kopec, E.	e-mail	843	ML090700186
96-e-HH/LE/WA	Kopec, E.	e-mail	843	ML090700186
96-f-DC/LE/WA	Kopec, E.	e-mail	843	ML090700186
96-g-EJ/HH/LE	Kopec, E.	e-mail	843	ML090700186
96-h-EP	Kopec, E.	e-mail	844	ML090700186
96-i-EJ/UF	Kopec, E.	e-mail	844	ML090700186
96-j-LR/PA/RW	Kopec, E.	e-mail	844 51	ML090700186
96-k-AE/TS	Kopec, E.	e-mail	844	ML090700186
96-l-AE/AL/RG	Kopec, E.	e-mail	845	ML090700186
96-m-AE	Kopec, E.	e-mail	845	ML090700186
96-n-AM/LE	Kopec, E.	e-mail	845	ML090700186
96-o-AL	Kopec, E.	e-mail	845	ML090700186

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96-p-OR	Kopec, E.	e-mail	846	ML090700186
97-a-EJ/HH	Kopshaw, K.	transcript	847	ML091410355
97-b-TS	Kopshaw, K.	transcript	847	ML091410355
97-c-AQ/WA	Kopshaw, K.	transcript	848	ML091410355
97-d-AE	Kopshaw, K.	transcript	849	ML091410355
97-e-PA	Kopshaw, K.	transcript	849	ML091410355
97-f-DE/PA	Kopshaw, K.	e-mail	851	ML090720652
97-g-EP/PA	Kopshaw, K.	e-mail	851	ML090720652
97-h-AE/AL	Kopshaw, K.	e-mail	851	ML090720652
97-i-AE/OL	Kopshaw, K.	e-mail	851	ML090720652
97-j-TS	Kopshaw, K.	e-mail	851	ML090720652
97-k-EJ/HH/LE	Kopshaw, K.	e-mail	852	ML090720652
98-a-EP/OR/PA	Kourie, K.	e-mail	853	ML090640375
98-b-AL/SA	Kourie, K.	e-mail	853	ML090640375
98-c-HH/LE/RI	Kourie, K.	e-mail	853	ML090640375
98-d-OR/RE	Kourie, K.	e-mail	853	ML090640375
99-a-SR	Kremer, A.	transcript	854	59 ML091410354
99-b-AQ/HH	Kremer, A.	transcript	854	ML091410354
99-c-AL/EC	Kremer, A.	transcript	855	ML091410354
99-d-AL/AQ	Kremer, A.	transcript	856	ML091410354
100-a-OR	Lapido, H.	e-mail	857	ML090640399
101-a-SR	Ledwith, R.	letter	858	59 ML091680292
101-b-EC	Ledwith, R.	letter	858	ML091680292
101-c-SO/SR	Ledwith, R.	letter	858	59 ML091680292
102-a-AL	Lee, M.	transcript	859	ML091410354
102-b-AE/GI	Lee, M.	transcript	859	ML091410354
102-c-RW/SF	Lee, M.	transcript	860	ML091410354
102-d-OW/PA/ST	Lee, M.	transcript	860	ML091410354
102-e-OE	Lee, M.	e-mail	861	ML090641135
102-f-AL	Lee, M.	e-mail	861	ML090641135
102-g-AE	Lee, M.	e-mail	861	ML090641135
102-h-HH/RI	Lee, M.	e-mail	861	ML090641135
102-i-AM/GL	Lee, M.	e-mail	861	ML090641135
102-j-PA	Lee, M.	e-mail	861	ML090641135
102-k-RW	Lee, M.	e-mail	861	ML090641135
102-l-NE/PA	Lee, M.	e-mail	862	ML090641135
102-m-GE/OM	Lee, M.	e-mail	862	ML090641135
102-n-AM	Lee, M.	e-mail	862	ML090641135
102-o-OM	Lee, M.	e-mail	862	ML090641135
102-p-OE	Lee, M.	e-mail	862	ML090641135

Comment ID	Commenter	Comment Source[(a)]	Comment Page No(s).	ADAMS Accession Number
103-a-AL/UF	Leifer, S.	transcript	863	ML091410355
103-b-RW/SF	Leifer, S.	transcript	863	ML091410355
103-c-AL/UF	Leifer, S.	transcript	863	ML091410355
104-a-LR	Likes, P.	hand-in	865	ML091740490
105-a-SO/SR	Ludwigson, S.	transcript	866	ML091410355
105-b-AL/EC	Ludwigson, S.	transcript	866	ML091410355
105-c-EC/SR	Ludwigson, S.	transcript	867	ML091410355
106-a-AE/LE/RW/SF	Mallon, Sister F.	letter	868	ML090860660
107-a-HH/RI	Mangano, J.	e-mail, hand-in	869	ML090640401 ML091740490 ML090540443
108-a-EC/SO/SR	Marzullo, D.	transcript	877	ML091410355
108-b-AL/GI/SR	Marzullo, D.	transcript	877	ML091410355
109-a-SO	Mattis, J.	transcript	879	ML091410354
109-b-EC/EP	Mattis, J.	transcript	879	ML091410354
109-c-SE/SO	Mattis, J.	transcript	879	ML091410354
109-d-SO/SR	Mattis, J.	transcript	880	ML091410354
110-a-OP/OR	Maturo, M.	e-mail	881	ML090771333
110-b-LE/WA	Maturo, M.	e-mail	881	ML090771333
110-c-AL/OP/ST	Maturo, M.	e-mail	881	ML090771333
111-a-SO	McCann, Dr. D	transcript	882	ML091410354
111-b-SO/SR	McCann, Dr. D	transcript	882	ML091410354
111-c-EC/SO	McCann, Dr. D	transcript	883	ML091410354
111-d-SO	McCann, Dr. D	transcript	883	ML091410354
112-a-AL/AQ/EC	McCormick, J.	transcript	885	ML091410354
112-b-AL/AQ/EC	McCormick, J.	transcript	886	ML091410354
112-c-AL	McCormick, J.	hand-in	889	ML091740490
112-d-AL/AQ	McCormick, J.	hand-in	889	ML091740490
112-e-AL/AQ	McCormick, J.	hand-in	892	ML091740490
112-f-AL/AQ	McCormick, J.	hand-in	892	ML091740490
112-g-AL/AQ/EC	McCormick, J.	hand-in	893	ML091740490
112-h-AL/RG	McCormick, J.	hand-in	894	ML091740490
112-i-SR	McCormick, J.	hand-in	894	ML091740490
113-a-SR	McDonald, N.	transcript	895	ML091410355
113-b-AE/AL/EJ	McDonald, N.	transcript	895	ML091410355
113-c-EJ/GE	McDonald, N.	transcript	896	ML091410355
113-d-AQ/GL/SR	McDonald, N.	transcript	896	ML091410355
113-e-SR	McDonald, N.	hand-in	899	ML091740490
113-f-AL/AQ	McDonald, N.	hand-in	899	ML091740490
113-g-AE/AL/AQ	McDonald, N.	hand-in	900	ML091740490
113-h-AE/GL	McDonald, N.	hand-in	901	ML091740490
113-i-AL/AQ	McDonald, N.	hand-in	902	ML091740490

Comment ID	Commenter	Comment Source[(a)]	Comment Page No(s).	ADAMS Accession Number
113-j-EC	McDonald, N.	hand-in	905	ML091740490
113-k-AL/AQ/RG	McDonald, N.	hand-in	905	ML091740490
113-l-SR	McDonald, N.	hand-in	907	ML091740490
114-a-SE	McGrath, J.	transcript	908	ML091410355
115-a-SA/SE/SO	Miranda, G.	transcript,	910	ML091410354
		hand-in		ML091740490
115-b-SO	Miranda, G.	transcript,	910	ML091410354
		hand-in		ML091740490
116-a-SO/SR	Miranda, R.	transcript	915	ML091410354
116-b-EC/SO	Miranda, R.	transcript	915	ML091410354
116-c-LR/SR	Miranda, R.	transcript	916	ML091410354
117-a-AM/LE/OR	Mitchell, G.	letter	917	ML090711022
117-b-AM/LE	Mitchell, G.	letter	917	ML090711022
117-c-DE/ST	Mitchell, G.	letter	917	ML090711022
118-a-AQ/EJ/SR	Montague, V.	transcript	918	ML091410354
118-b-EC/EJ/SR	Montague, V.	transcript	919	ML091410354
119-a-SR	Mooney, W.	e-mail, letter	921	ML090680019
				ML091680294
				ML090680022
119-b-EC/SO	Mooney, W.	e-mail, letter	921	ML090680019
				ML091680294
				ML090680022
119-c-AQ/EC/SO	Mooney, W.	e-mail, letter	921	ML090680019
				ML091680294
				ML090680022
119-d-AQ/SE	Mooney, W.	e-mail, letter	921	ML090680019
				ML091680294
				ML090680022
119-e-EC/GI/SO	Mooney, W.	e-mail, letter	921	ML090680019
				ML091680294
				ML090680022
119-f-SR	Mooney, W.	e-mail, letter	921	ML090680019
				ML091680294
				ML090680022
119-g-EC/SO/SR	Mooney, W.	transcript	922	ML091410354
119-h-AQ	Mooney, W.	transcript	922	ML091410354
119-i-SO	Mooney, W.	transcript	922	ML091410354
119-j-SE/SR	Mooney, W.	transcript	922	ML091410354
120-a-EC/SA	Moore, Dr. P.	transcript	924	ML091410355
120-b-HH	Moore, Dr. P.	transcript	924	ML091410355

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120-c-AL/AQ/EC	Moore, Dr. P.	transcript	925	ML091410355
120-d-OS	Moore, Dr. P.	transcript	926	ML091410355
120-e-AE	Moore, Dr. P.	transcript	926	ML091410355
120-f-AE	Moore, Dr. P.	transcript	926	ML091410355
120-g-EC	Moore, Dr. P.	hand-in	928	ML091740490
120-h-OP/HH	Moore, Dr. P.	hand-in	928	ML091740490
120-i-AL/AQ/GI	Moore, Dr. P.	hand-in	929	ML091740490
120-j-AL/AQ	Moore, Dr. P.	hand-in	929	ML091740490
120-k-AE	Moore, Dr. P.	hand-in	930	ML091740490
120-l-LE	Moore, Dr. P.	hand-in	931	ML091740490
120-m-RW/SF	Moore, Dr. P.	hand-in	931	ML091740490
120-n-ST	Moore, Dr. P.	hand-in	931	ML091740490
120-o-LE	Moore, Dr. P.	hand-in	931	ML091740490
120-p-SR	Moore, Dr. P.	hand-in	932	ML091740490
121-a-DE/OR	Murdock, C.	e-mail	933	ML090771332
121-b-AM/LE	Murdock, C.	e-mail	933	ML090771332
121-c-OR/PA	Murdock, C.	e-mail	933	ML090771332
122-a-DE/PA/ST	Murphy, R.	e-mail	934	ML090640396
122-b-LE	Murphy, R.	e-mail	934	ML090640396
122-c-AE	Murphy, R.	e-mail	934	ML090640396
122-d-AL	Murphy, R.	e-mail	934	ML090640396
123-a-AE	Musegaas, P.	transcript	935	ML091410355
123-b-AE	Musegaas, P.	transcript	935	ML091410355
123-c-AE	Musegaas, P.	transcript	936	ML091410355
123-d-GE/SF	Musegaas, P.	transcript	936	ML091410355
123-e-RW/SF	Musegaas, P.	transcript	937	ML091410355
123-f-GE	Musegaas, P.	transcript	937	ML091410355
123-g-AL	Musegaas, P.	transcript	937	ML091410355
124-a-AL/RW/SF	Myslinski, M.	e-mail	939	ML090720655
124-b-EJ/EP/HH/PA	Myslinski, M.	e-mail	939	ML090720655
125-a-DE/EP	Nemeczek, J.	e-mail	940	ML090720648
125-b-EP	Nemeczek, J.	e-mail	940	ML090720648
126-a-DE/RW/SF/ST	Newman, J.	e-mail	941	ML090650457
126-b-AE	Newman, J.	e-mail	941	ML090650457
126-c-LE	Newman, J.	e-mail	941	ML090650457
126-d-LE/RI	Newman, J.	e-mail	941	ML090650457
127-a-SA/SR	Nicklas, D.	transcript	942	ML091410355
127-b-EC/SO	Nicklas, D.	transcript	942	ML091410355
127-c-AL/SR	Nicklas, D.	transcript	942	ML091410355
128-a-LR	NYSDEC	e-mail	948	ML090780782
128-b-AE/EP/TS	NYSDEC	e-mail	948	ML090780782

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128-c-GE/LR	NYSDEC	e-mail	949	ML090780782
128-d-GE/LR	NYSDEC	e-mail	949	ML090780782
128-e-AE	NYSDEC	e-mail	950	ML090780782
128-f-AE	NYSDEC	e-mail	951	ML090780782
128-g-AE	NYSDEC	e-mail	952	ML090780782
128-h-AE/AL	NYSDEC	e-mail	954	ML090780782
128-i-AL	NYSDEC	e-mail	956	ML090780782
128-j-AE	NYSDEC	e-mail	961	ML090780782
128-k-AE	NYSDEC	e-mail	962	ML090780782
128-l-AE	NYSDEC	e-mail	962	ML090780782
128-m-AE	NYSDEC	e-mail	963	ML090780782
128-n-AE	NYSDEC	e-mail	963	ML090780782
128-o-TS	NYSDEC	e-mail	963	ML090780782
128-p-TS	NYSDEC	e-mail	964	ML090780782
128-q-AE	NYSDEC	e-mail	966	ML090780782
128-r-SM/UF	NYSDEC	e-mail	967	ML090780782
128-s-EP	NYSDEC	e-mail	975	ML090780782
129-a-LR	NYSO of the Attorney General	hand-in	986	ML090771328
129-b-UF	NYSO of the Attorney General	hand-in	990	ML090771328
129-c-RW	NYSO of the Attorney General	hand-in	994	ML090771328
129-d-AL/LU	NYSO of the Attorney General	hand-in	997	ML090771328
129-e-SM	NYSO of the Attorney General	hand-in	1002	ML090771328
129-f-AL	NYSO of the Attorney General	hand-in	1006	ML090771328
129-g-AL	NYSO of the Attorney General	hand-in	1008	ML090771328
129-h-AL	NYSO of the Attorney General	hand-in	1014	ML090771328
129-i-AL	NYSO of the Attorney General	hand-in	1016	ML090771328
129-j-AL	NYSO of the Attorney General	hand-in	1017	ML090771328
129-k-AL/LR	NYSO of the Attorney General	hand-in	1018	ML090771328
129-l-AL	NYSO of the Attorney General	hand-in	1018	ML090771328
129-m-SM	NYSO of the Attorney General	hand-in	1022	ML090771328
129-n-SM	NYSO of the Attorney General	hand-in	1028	ML090771328
129-o-SM	NYSO of the Attorney General	hand-in	1032	ML090771328
130-a-AQ/SR	Oros, G.	transcript	1044	ML091410354
130-b-OP/SO/SR	Oros, G.	transcript	1045	ML091410354

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131-a-OS	Otis, M.	transcript	1046	ML091410355
131-b-SE	Otis, M.	transcript	1046	ML091410355
131-c-SE/SR	Otis, M.	transcript	1047	ML091410355
131-d-SE	Otis, M.	hand-in	1048	ML091740490
131-e-AQ/EC/SR	Otis, M.	hand-in	1049	ML091740490
132-a-AL	Parker, J.	transcript	1051	ML091410354
132-b-NE	Parker, J.	transcript	1051	ML091410354
132-c-AE	Parker, J.	transcript	1052	ML091410354
132-d-GI/LR	Parker, J.	transcript	1052	ML091410354
132-e-GI/LR	Parker, J.	transcript	1052	ML091410354
132-f-AE	Parker, J.	transcript	1053	ML091410354
132-g-GI/LR	Parker, J.	transcript	1053	ML091410354
133-a-EC/SO/SR	Perry, S.	transcript	1055	ML091410354
133-b-EC	Perry, S.	transcript	1055	ML091410354
133-c-AQ	Perry, S.	transcript	1055	ML091410354
133-d-AL/AQ/SR	Perry, S.	transcript	1056	ML091410354
134-a-AL/AQ/GI	Perry, D.	transcript	1057	ML091410355
134-b-AL/AQ/EJ	Perry, D.	transcript	1057	ML091410355
135-a-LE/OR	Pilder, L.	e-mail	1059	ML090640206
135-b-LE	Pilder, L.	e-mail	1059	ML090640206
135-c-RW/SF/ST	Pilder, L.	e-mail	1059	ML090640206
136-a-CR/SO/SR	Pockriss, P.	transcript	1060	ML091410354
136-b-SO/SR	Pockriss, P.	transcript	1060	ML091410354
136-c-SE	Pockriss, P.	transcript	1061	ML091410354
137-a-SA/SR	Puglisi, L.	transcript	1062	ML091410355
137-b-GW/RW/PA/SF	Puglisi, L.	transcript	1063	ML091410355
137-c-NE	Puglisi, L.	transcript	1063	ML091410355
137-d-LR/ST	Puglisi, L.	transcript	1063	ML091410355
137-e-LR	Puglisi, L.	hand-in	1066	ML091740490
137-f-AL/LE/PA/RF/SF	Puglisi, L.	hand-in	1067	ML091740490
137-g-NE/RW	Puglisi, L.	hand-in	1067	ML091740490
137-h-AL	Puglisi, L.	hand-in	1068	ML091740490
137-i-PA	Puglisi, L.	hand-in	1068	ML091740490
137-j-RI	Puglisi, L.	hand-in	1068	ML091740490
137-k-RF	Puglisi, L.	hand-in	1069	ML091740490
137-l-DC/RW	Puglisi, L.	hand-in	1069	ML091740490
137-m-LR	Puglisi, L.	hand-in	1071	ML091740490
137-n-LR	Puglisi, L.	hand-in	1071	ML091740490
137-o-SO	Puglisi, L.	hand-in	1071	ML091740490
137-p-ST	Puglisi, L.	hand-in	1071	ML091740490
137-q-EP	Puglisi, L.	hand-in	1071	ML091740490

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137-r-LR	Puglisi, L.	hand-in	1073	ML091740490
138-a-EJ/HH/LE	Race, K.	e-mail	1074	ML090720659
139-a-TS	Raddant, A.	e-mail	1077	ML090771341
139-b-TS	Raddant, A.	e-mail	1077	ML090771341
139-c-AE	Raddant, A.	e-mail	1078	ML090771341
139-d-AE	Raddant, A.	e-mail	1078	ML090771341
139-e-AE	Raddant, A.	e-mail	1079	ML090771341
139-f-AL/LR	Raddant, A.	e-mail	1079	ML090771341
139-g-LR	Raddant, A.	e-mail	1080	ML090771341
140-a-AE	Riverkeeper, Inc.	e-mail	1082	ML090860983
140-b-EP	Riverkeeper, Inc.	e-mail	1083	ML090860983
140-c-AE	Riverkeeper, Inc.	e-mail	1085	ML090860983
140-d-AE	Riverkeeper, Inc.	e-mail	1087	ML090860983
140-e-AE	Riverkeeper, Inc.	e-mail	1088	ML090860983
140-f-AE	Riverkeeper, Inc.	e-mail	1089	ML090860983
140-g-AE	Riverkeeper, Inc.	e-mail	1089	ML090860983
140-h-AE	Riverkeeper, Inc.	e-mail	1090	ML090860983
140-i-AE	Riverkeeper, Inc.	e-mail	1091	ML090860983
140-j-AE	Riverkeeper, Inc.	e-mail	1091	ML090860983
140-k-AE	Riverkeeper, Inc.	e-mail	1092	ML090860983
140-l-AE	Riverkeeper, Inc.	e-mail	1092	ML090860983
140-m-TS	Riverkeeper, Inc.	e-mail	1092	ML090860983
140-n-TS	Riverkeeper, Inc.	e-mail	1093	ML090860983
140-o-TS	Riverkeeper, Inc.	e-mail	1094	ML090860983
140-p-TS	Riverkeeper, Inc.	e-mail	1094	ML090860983
140-q-TS	Riverkeeper, Inc.	e-mail	1094	ML090860983
140-r-TS	Riverkeeper, Inc.	e-mail	1096	ML090860983
140-s-TS	Riverkeeper, Inc.	e-mail	1096	ML090860983
140-t-TS	Riverkeeper, Inc.	e-mail	1097	ML090860983
140-u-GW/SA	Riverkeeper, Inc.	e-mail	1097	ML090860983
140-v-GW/HH/RI	Riverkeeper, Inc.	e-mail	1099	ML090860983
140-w-GW/HH/RI	Riverkeeper, Inc.	e-mail	1100	ML090860983
140-x-HH	Riverkeeper, Inc.	e-mail	1102	ML090860983
140-y-AE/CI	Riverkeeper, Inc.	e-mail	1105	ML090860983
140-z-AE/CI	Riverkeeper, Inc.	e-mail	1105	ML090860983
140-aa-SM	Riverkeeper, Inc.	e-mail	1106	ML090860983
140-bb-SM	Riverkeeper, Inc.	e-mail	1106	ML090860983
140-cc-SM	Riverkeeper, Inc.	e-mail	1110	ML090860983
140-dd-SM	Riverkeeper, Inc.	e-mail	1114	ML090860983
140-ee-SM	Riverkeeper, Inc.	e-mail	1115	ML090860983
140-ff-SM	Riverkeeper, Inc.	e-mail	1115	ML090860983
140-gg-UF	Riverkeeper, Inc.	e-mail	1117	ML090860983

Comment ID	Commenter	Comment Source[(a)]	Comment Page No(s).	ADAMS Accession Number
140-hh-SM	Riverkeeper, Inc.	e-mail	1119	ML090860983
140-ii-SM/UF	Riverkeeper, Inc.	e-mail	1119	ML090860983
140-jj-SM	Riverkeeper, Inc.	e-mail	1120	ML090860983
140-kk-AL	Riverkeeper, Inc.	e-mail	1122	ML090860983
140-ll-AL	Riverkeeper, Inc.	e-mail	1122	ML090860983
140-mm-AL	Riverkeeper, Inc.	e-mail	1123	ML090860983
140-nn-AL	Riverkeeper, Inc.	e-mail	1124	ML090860983
140-oo-AL	Riverkeeper, Inc.	e-mail	1124	ML090860983
140-pp-AL	Riverkeeper, Inc.	e-mail	1125	ML090860983
140-qq-AL	Riverkeeper, Inc.	e-mail	1126	ML090860983
140-rr-AL	Riverkeeper, Inc.	e-mail	1126	ML090860983
140-ss-LR	Riverkeeper, Inc.	e-mail	1127	ML090860983
140-tt-AE	Riverkeeper, Inc.	e-mail	1133	ML090860983
140-uu-TS	Riverkeeper, Inc.	e-mail	1142	ML090860983
140-vv-AE	Riverkeeper, Inc.	e-mail	1142	ML090860983
140-ww-AE/CI	Riverkeeper, Inc.	e-mail	1142	ML090860983
140-xx-AE	Riverkeeper, Inc.	e-mail	1142	ML090860983
140-yy-AE	Riverkeeper, Inc.	e-mail	1143	ML090860983
141-a-OR	ROAR	letter	1151	ML090860662
141-b-AM/DE/PA/RW	ROAR	letter	1151	ML090860662
141-c-AE/LE/RI	ROAR	letter	1151	ML090860662
141-d-AL/OR	ROAR	letter	1151	ML090860662
142-a-LE/OR	Rogers, Sister Mary Christine	letter	1152	ML091680291
143-a-GI/OR/RW	Rosenfeld, A.	e-mail	1153	ML090700174
144-a-EC/SA/SR	Ryan, T.	transcript	1154	ML091410355
144-b-EC/SO	Ryan, T.	transcript	1154	ML091410355
144-c-ST	Ryan, T.	transcript	1155	ML091410355
144-d-AL/OS	Ryan, T.	transcript	1155	ML091410355
145-a-AM/PA	Ryan, M.	e-mail	1157	ML090771330
145-b-RW/SF/ST	Ryan, M.	e-mail	1157	ML090771330
145-c-HH/LE	Ryan, M.	e-mail	1157	ML090771330
145-d-LE/OM/WA	Ryan, M.	e-mail	1157	ML090771330
145-e-AE	Ryan, M.	e-mail	1157	ML090771330
145-f-DE/OR	Ryan, M.	e-mail	1157	ML090771330
145-g-OE	Ryan, M.	transcript	1158	ML091410355
146-a-EP/SE	Safian, K.	transcript	1159	ML091410355
146-b-EC	Safian, K.	transcript	1160	ML091410355
146-c-AQ/SR	Safian, K.	transcript	1160	ML091410355
146-d-EC/SO	Safian, K.	transcript	1161	ML091410355
147-a-GL/LE	Sambrook, A.	e-mail	1162	ML090700175
147-b-NE/PA	Sambrook, A.	e-mail	1162	ML090700175

Comment ID	Commenter	Comment Source[(a)]	Comment Page No(s).	ADAMS Accession Number
147-c-AM	Sambrook, A.	e-mail	1162	ML090700175
147-d-OR	Sambrook, A.	e-mail	1162	ML090700175
148-a-AL/SO	Samuels, A.	transcript	1163	ML091410354
148-b-AL/SO	Samuels, A.	e-mail	1166	ML090700184
148-c-AL/SO	Samuels, A.	hand-in	1167	ML091740490
149-a-AE	Scarola, J.	e-mail	1172	ML090720657
149-b-EJ/HH	Scarola, J.	e-mail	1172	ML090720657
149-c-HH/LE	Scarola, J.	e-mail	1172	ML090720657
149-d-EP/HH/RI	Scarola, J.	e-mail	1173	ML090720657
149-e-TS	Scarola, J.	e-mail	1173	ML090720657
150-a-SA/SE	Seeger, B.	transcript	1174	ML091410355
150-b-SA/SO	Seeger, B.	transcript	1174	ML091410355
150-c-SA/SE	Seeger, B.	transcript	1175	ML091410355
150-d-EC/SR	Seeger, B.	letter	1177	ML091680296
150-e-AQ/OP/SO	Seeger, B.	letter	1177	ML091680296
150-f-SO/SR	Seeger, B.	letter	1177	ML091680296
151-a-OR	Seeman, L.	transcript	1178	ML091410355
151-b-OS	Seeman, L.	transcript	1178	ML091410355
151-c-SA	Seeman, L.	transcript	1179	ML091410355
151-d-EP	Seeman, L.	transcript	1180	ML091410355
151-e-OR	Seeman, L.	transcript	1181	ML091410355
152-a-GE/PA	Shapiro, S.	transcript	1182	ML091410354
152-b-AM/SA	Shapiro, S.	transcript	1183	ML091410354
152-c-LE/OP	Shapiro, S.	transcript	1183	ML091410354
152-d-AM/OP	Shapiro, S.	transcript	1184	ML091410354
152-e-NE	Shapiro, S.	transcript	1185	ML091410354
153-a-LE	Shaw, G.	transcript	1186	ML091410355
153-b-LE	Shaw, G.	transcript	1186	ML091410355
153-c-OM	Shaw, G.	transcript	1187	ML091410355
153-d-AM/LE/OM	Shaw, G.	transcript	1187	ML091410355
153-e-AM/DE	Shaw, G.	transcript	1188	ML091410355
154-a-HH/LE/MP	Shepard, M.	transcript	1189	ML091410355
154-b-AL	Shepard, M.	transcript	1191	ML091410355
155-a-EC/SO	Sherman, A.	transcript, hand-in	1192	ML091410354ML091740490
155-b-PA	Sherman, A.	transcript, hand-in	1192	ML091410354ML091740490
155-c-AL/SA	Sherman, A.	transcript, hand-in	1193	ML091410354 ML091740490
155-d-OR	Sherman, A.	transcript, hand-in	1193	ML091410354 ML091740490
156-a-SE/SR	Skanes, B.	transcript	1194	ML091410354

Comment ID	Commenter	Comment Source[(a)]	Comment Page No(s).	ADAMS Accession Number
157-a-OP	Slevin, J.	transcript	1196	ML091410354
157-b-AL/EC/SO	Slevin, J.	transcript	1196	ML091410354
157-c-AQ/EC	Slevin, J.	transcript	1197	ML091410354
157-d-EC/SR	Slevin, J.	transcript	1197	ML091410354
157-e-OP	Slevin, J.	letter	1199	ML090711019
157-f-AL/EC/SO	Slevin, J.	letter	1199	ML090711019
158-a-EJ/SR	Smith, Rev. G. R.	transcript	1201	ML091410354
158-b-AL/AQ/EC	Smith, Rev. G. R.	transcript	1202	ML091410354
159-a-EC/GL	Smith, C.	transcript	1204	ML091410354
159-b-AL/SA/SR	Smith, C.	transcript	1204	ML091410354
159-c-EC/SR	Smith, C.	transcript	1205	ML091410354
159-d-EC	Smith, C.	transcript	1205	ML091410354
159-e-AL/AQ/SR	Smith, C.	transcript	1205	ML091410354
160-a-AL/OR/SA	Sorbello, D.	e-mail	1206	ML090640372
161-a-GI	Starke, A.	transcript	1207	ML091410355
161-b-GI/LE/WA	Starke, A.	transcript	1207	ML091410355
161-c-RW/ST	Starke, A.	transcript	1207	ML091410355
161-d-GI/OR	Starke, A.	e-mail	1209	ML090771338
161-e-AE	Starke, A.	e-mail	1209	ML090771338
161-f-LE/WA	Starke, A.	e-mail	1209	ML090771338
161-g-ST/UF	Starke, A.	e-mail	1209	ML090771338
161-h-DE/ST	Starke, A.	e-mail	1209	ML090771338
161-i-AL/OR	Starke, A.	e-mail	1209	ML090771338
162-a-OR/RW	Sullivan, J.	transcript	1211	ML091410354
162-b-AL/SF/ST	Sullivan, J.	transcript	1211	ML091410354
162-c-OR	Sullivan, J.	e-mail	1212	ML090771345
162-d-GW/LE/PA	Sullivan, J.	e-mail	1212	ML090771345
162-e-AM/RW	Sullivan, J.	e-mail	1212	ML090771345
162-f-OR	Sullivan, J.	e-mail	1212	ML090771345
163-a-SE/SO/SR	Swertfager, D.	e-mail	1213	ML090640368
164-a-PA/ST	Taormino, M.	transcript	1216	ML091410355
164-b-EP	Taormino, M.	transcript	1216	ML091410355
164-c-LE/TE	Taormino, M.	transcript	1216	ML091410355
164-d-LR/OM	Taormino, M.	transcript	1217	ML091410355
164-e-EP	Taormino, M.	transcript	1217	ML091410355
164-f-EJ/EP	Taormino, M.	e-mail	1219	ML090720660
164-g-LE/MP	Taormino, M.	e-mail	1219	ML090720660
164-h-UF	Taormino, M.	e-mail	1220	ML090720660
164-i-GL	Taormino, M.	e-mail	1220	ML090720660
165-a-OR/PA	Tompkins, D.	e-mail	1221	ML090640357
166-a-AE	Tracey, M.	letter	1222	ML091680293
166-b-AL/EC/SO	Tracey, M.	letter	1222	ML091680293

Comment ID	Commenter	Comment Source[(a)]	Comment Page No(s).	ADAMS Accession Number
166-c-AL/HH	Tracey, M.	letter	1222	ML091680293
166-d-SO/SR	Tracey, M.	letter	1222	ML091680293
166-e-SO/SR	Tracey, M.	hand-in	1223	ML091740490
166-f-AL/EC	Tracey, M.	hand-in	1223	ML091740490
166-g-AE/SO	Tracey, M.	hand-in	1224	ML091740490
167-a-AE	Unknown (Sister A.?)	letter	1225	ML090860665
167-b-OR/RW/SF	Unknown (Sister A.?)	letter	1225	ML090860665
168-a-OS	Various Authors	hand-in	1226	ML091740490
169-a-AL/EC/SO	Vitale, P.	transcript	1289	ML091410354
169-b-AL/AQ/EC	Vitale, P.	transcript	1289	ML091410354
170-a-OR	Walsh, M.	e-mail	1291	ML090780761
170-b-HH	Walsh, M.	e-mail	1291	ML090780761
170-c-DE/PA	Walsh, M.	e-mail	1291	ML090780761
170-d-PA/SM	Walsh, M.	e-mail	1291	ML090780761
170-e-LE/WA	Walsh, M.	e-mail	1293	ML090780761
170-f-HH/PA/UF	Walsh, M.	e-mail	1293	ML090780761
170-g-AL	Walsh, M.	e-mail	1293	ML090780761
170-h-HH/OR	Walsh, M.	e-mail	1293	ML090780761
171-a-SO	Waltzer, R.	transcript	1295	ML091410355
171-b-PA/ST	Waltzer, R.	transcript	1295	ML091410355
172-a-HH/RI	Wanshel, J.	e-mail	1296	ML090771331 MI090820080
172-b-DE/EP	Wanshel, J.	e-mail	1296	ML090771331 MI090820080
172-c-ST	Wanshel, J.	e-mail	1296	ML090771331 MI090820080
172-d-LR	Wanshel, J.	e-mail	1296	ML090771331 MI090820080
173-a-AE/EP/ST	Warren, R.	e-mail	1297	ML090640387
173-b-AL/OR	Warren, R.	e-mail	1297	ML090640387
174-a-HH/RI	Weininger, E.	e-mail	1298	ML090700177
174-b-RI	Weininger, E.	e-mail	1298	ML090700177
174-c-HH	Weininger, E.	e-mail	1298	ML090700177
174-d-PA	Weininger, E.	e-mail	1298	ML090700177
174-e-NE/PA	Weininger, E.	e-mail	1298	ML090700177
174-f-GI/OM	Weininger, E.	e-mail	1298	ML090700177
174-g-AM	Weininger, E.	e-mail	1298	ML090700177
174-h-SA	Weininger, E.	e-mail	1298	ML090700177
174-i-AL	Weininger, E.	e-mail	1298	ML090700177
174-j-OR	Weininger, E.	e-mail	1298	ML090700177
175-a-OP/OR/PA	Weininger, A.	e-mail	1299	ML090720672
176-a-OR	Weinstein, D.	e-mail	1300	ML090700183

Comment ID	Commenter	Comment Source[(a)]	Comment Page No(s).	ADAMS Accession Number
176-b-AE	Weinstein, D.	e-mail	1300	ML090700183
176-c-AE	Weinstein, D.	e-mail	1300	ML090700183
176-d-LE	Weinstein, D.	e-mail	1300	ML090700183
176-e-RW/SF/ST	Weinstein, D.	e-mail	1300	ML090700183
176-f-OR	Weinstein, D.	e-mail	1300	ML090700183
177-a-AQ/EC/SO	Wilson, C.	transcript,	1301	ML091410355
		hand-in		ML091740490
177-b-EC	Wilson, C.	transcript,	1301	ML091410355
		hand-in		ML091740490
177-c-AQ	Wilson, C.	transcript,	1302	ML091410355
		hand-in		ML091740490
177-d-AQ/EJ/SR	Wilson, C.	transcript,	1302	ML091410355
		hand-in		ML091740490
178-a-LE/OR/RW	Withrow, L.	e-mail	1304	ML090640359
179-a-SA/SF/RW	Wolf, P.	transcript	1305	ML091410354
179-b-LE/OP/SA	Wolf, P.	transcript	1306	ML091410354
179-c-PA	Wolf, P.	transcript	1306	ML091410354
179-d-DE	Wolf, P.	transcript	1307	ML091410354
179-e-LE/WA	Wolf, P.	transcript	1307	ML091410354
179-f-RW/SF/ST	Wolf, P.	transcript	1307	ML091410354
179-g-AM	Wolf, P.	transcript	1307	ML091410354
179-h-OR/SA	Wolf, P.	transcript	1307	ML091410354
179-i-OE	Wolf, P.	e-mail	1309	ML090771340
180-a-HH/LE/RI	Wood, P.	e-mail	1310	ML090700178
180-b-AL	Wood, P.	e-mail	1310	ML090700178
180-c-AE	Wood, P.	e-mail	1310	ML090700178
180-d-AM/GL	Wood, P.	e-mail	1310	ML090700178
180-e-PA	Wood, P.	e-mail	1310	ML090700178
180-f-RW	Wood, P.	e-mail	1310	ML090700178
180-g-PA	Wood, P.	e-mail	1310	ML090700178
180-h-GI/OM	Wood, P.	e-mail	1311	ML090700178
180-i-AM	Wood, P.	e-mail	1311	ML090700178
180-j-OM	Wood, P.	e-mail	1311	ML090700178
181-a-SE/SR	Yanofsky, J.	transcript	1312	ML091410354
182-a-LE/OR	Yarme, J.	e-mail	1315	ML090720678
182-b-AE/HH/RW/SF	Yarme, J.	e-mail	1315	ML090720678
182-c-EP/ST	Yarme, J.	e-mail	1315	ML090720678
182-d-AL/EJ/OR	Yarme, J.	e-mail	1315	ML090720678
183-a-EP/HH/PA	Yaroscak-Lanzotti, H.	e-mail	1316	ML090771344
183-b-AM/OM	Yaroscak-Lanzotti, H.	e-mail	1316	ML090771344
183-c-EP/HH/PA	Yaroscak-Lanzotti, H.	e-mail	1316	ML090771344

Comment ID	Commenter	Comment Source[(a)]	Comment Page No(s).	ADAMS Accession Number
183-d-ST	Yaroscak-Lanzotti, H.	e-mail	1316	ML090771344

(a) Transcript comments were received orally during one of two dSEIS comment meetings held on February 12, 2009, and transcribed by a certified court reporter.

A.2 Comments and Responses

Comments and responses in this section are grouped in the following categories:

A.2.1 Comments Concerning the License Renewal Process A-48

A.2.1.1 NEPA A-54

A.2.1.2 GEIS A-56

A.2.2 Comments in Support of License Renewal at Indian Point Nuclear Generating Units 2 and 3 A-58

A.2.3 Comments in Opposition of License Renewal at Indian Point Nuclear Generating Units 2 and 3 A-60

A.2.4 Comments Concerning Surface-Water Quality, Hydrology, Groundwater, and Water Use Issues A-60

A.2.5 Comments Concerning Aquatic Ecology, Terrestrial Ecology, General Ecology, and Threatened and Endangered Species A-62

A.2.6 Comments Concerning Human Health Issues A-92

A.2.7 Comments Concerning Socioeconomic Issues A-101

A.2.7.1 Demographics A-106

A.2.7.2 Aesthetics A-108

A.2.7.3 Psycho-Social Effects A-109

A.2.7.4 Environmental Justice A-110

A.2.8 Comments Concerning Land Use Issues A-121

A.2.9 Comments Concerning Postulated Accidents A-123

A.2.10 Comments Concerning Severe Accident Mitigation Alternatives (SAMAs) A-127

A.2.11 Comments Concerning Uranium Fuel Cycle and Waste Management Issues A-134

A.2.12 Comments Concerning Radiological Impact A-142

A.2.13 Comments Concerning Spent Fuel A-144

A.2.14 Comments Concerning Alternatives A-150

A.2.15 Comments Concerning Decommissioning Issues A-160

A.2.16 Comments Concerning Greenhouse Gases A-162

A.2.17 Comments Concerning Editorial Issues A-164

A.2.18 Comments Concerning Refurbishment A-166

A.2.19 Comments Outside the Scope of the Environmental Review for License Renewal: Safeguards and Security; Operational Safety; Aging Management; Need for Power; Energy Costs, etc. A-167

A.2.1 Comments Concerning the License Renewal Process

The following comments offer general opposition to the NRC's method of regulation:

3-a-AE/LE/LR; 82-b-GI/LR; 82-c-LR; 104-a-LR; 125-a-LR; 128-a-LR; 132-d-GI/LR

Response: *The NRC welcomes public participation in the rulemaking process. There are several ways for the public to participate in the rulemaking:*

- *The public may provide comments in response to a Federal Register notice. The NRC publishes notices of rulemaking activities in the Federal Register to solicit public comments, and may also publish a notice of a meeting or workshop to be held regarding a rule. The Federal Register notice contains information on how to provide specific comments on a proposed rule to the NRC.*

- *The public may provide comments on the NRC's Rule Forum website. The NRC's Rule Forum is a web-based computer forum that was developed to provide an easy means for a member of the public to access and comment on NRC rulemaking activities. The Rule Forum contains proposed rulemakings that have been published by the NRC in the Federal Register, petitions for rulemakings that have been received and docketed by the NRC, and other types of documents related to rulemaking.*

- *Members of the public can provide comments on the NRC's Technical Conference Forum website. The Technical Conference Forum is a web-based forum that facilitates public participation on NRC issues related to the development of draft rulemakings, draft guidance documents, and other initiatives.*

- *Members of the public may petition the NRC to develop, change or rescind a rule by filing a petition for rulemaking in accordance with the regulations in 10 CFR 2.802.*

Before filing a petition for rulemaking, a member of the public may consult with the NRC concerning questions about NRC regulations by calling the Rules and Directives Branch at 301-415-7163 or toll-free at 800-368-5642, or by writing the following address;

Chief
Rule and Directives Branch
Division of Administrative Services
Office of Administration
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

The information that members of the public can receive when consulting with the NRC about a petition for rulemaking includes a description of the procedures and process for filing and responding to a petition for rulemaking, clarification of an existing NRC regulation and the basis for the regulation, or assistance in clarifying their potential petition so that the Commission is better able to understand the nature of the issues that are concern.

Petitions should be submitted to the following address:

Secretary
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001
Attn: Rulemakings and Adjudications Staff
E-mail: secy@nrc.gov
Fax: 301-415-1101

The petitions must, as a minimum, outline a general solution to a problem, or present the substance or text of any proposed regulations or amendment or specify the regulation that the petitioner proposes to be rescinded or amended. In writing a petition, a member of the public should state clearly and concisely his or her grounds for, and interest in the proposal, and also include a statement in support of the petition that outlines the specific issues involved: the views or arguments regarding those issues; the relevant technical, scientific or other data that is reasonably available; and any other pertinent information to support the proposal.

The following comment states that the NRC cannot issue a renewed operating license until New York State concurs with Entergy's application for consistency certification:

4-a-AE/LR

Response: *The NRC's process for making a decision to grant or deny a license renewal application is based on whether there is reasonable assurance that the requirements in the NRC's regulations for license renewal can be met. If the applicant meets the requirements in the regulations, the NRC may approve renewal of the license.*

Under the authority granted to New York State by the Federal Coastal Zone Management Act and codified in 15 CFR Part 930, the State must determine whether a Federal action is consistent with the State's Coastal Management Plan. The NRC recognizes that the New York State Department of State will review Entergy's application for consistency with the State's Coastal Management Plan, and also recognizes that continued operation of IP2 and IP3 will require a positive consistency determination by the State. Objections by the Department of State may be appealed to the U.S. Commerce Secretary.

The NRC will continue to monitor the actions of New York State regarding Entergy's consistency certification relating to IPEC's license renewal application.

The following comments state that the views of local agencies regarding the preparation of the Environmental Impact Statement should be considered:

59-a-LR; 137-d-LR/ST

Response: *Governmental agencies other than the NRC are invited through the environmental scoping process to assess whether or not they should be considered cooperating agencies under the regulatory structure afforded by the President's Council on Environmental Quality (CEQ). It also invites them to identify whether or not they have a particular expertise on an issue that may be invaluable to the NRC, or have consultation roles under other statues that may have a bearing on site-specific issues.*

A notice of the receipt of the license renewal application is posted in the Federal Register shortly after it is received by the NRC. The notice indicates where copies are available and how they can be obtained. Other Federal, State, and local governmental agencies that are interested in reviewing the application can obtain a copy and provide comments to the NRC during the scoping process or after publication of the draft site-specific supplement to the generic environmental impact statement. The NRC considers those comments during its review of the license renewal application and its development of the draft and final environmental impact statement.

The following are general comments indicating the NRC is required to comply with NEPA:

79-d-LR/NE; 128-d-GE/LR; 140-ss-LR

Response: *The NRC fully supports the principles of NEPA which establishes a national policy that:*

• encourages productive and enjoyable harmony between man and his environment,

• promotes efforts which will prevent or eliminate damage to the environment and biosphere and stimulate the health and welfare of man, and

• enriches the understanding of the ecological systems and natural resources important to the Nation.

The NEPA regulations adopted by the Council on Environmental Quality (CEQ) direct Federal agencies on matters related to environmental policy, including the public scoping process, use of lead agencies, and selection of alternatives. The NRC is an independent regulatory agency. As an independent agency, the NRC has established its own regulations to implement NEPA. The Commission's policy is to take account of the CEQ's regulations voluntarily. The NRC's requirements for compliance with NEPA is contained in 10 CFR Part 51, Subpart A; National Environmental Policy Act – Regulations Implementing Section 102(2).

The Commission recognizes a continuing obligation to conduct its domestic licensing and related regulatory functions in a manner that is both receptive to environmental concerns and consistent with the Commission's responsibility as an independent regulatory agency for protecting the health and safety of the public.

The following comment suggests that the determination of impacts in the SEIS should be based on more recent and comprehensive studies:

79-aa-LR

Response: *The Comment suggests that in order to adequately assess the impacts of license renewal, the NRC staff must obtain more recent and comprehensive studies related to radiological impacts on human health, aquatic resources, and environmental justice.*

The impact on each of these resource areas have been evaluated and documented in the draft SEIS, and additional information related to these resource areas were also considered during the NRC staff's review of comments on the draft SEIS.

With respect to radiological impacts on human health impacts, which is a Category 1 issue, the staff considered new information to determine whether it would indicate that the impacts are beyond those described in the GEIS. The staff's finding, as documented in Section 4.3, did not change for radiological impacts on human health.

With respect to impacts on aquatic resources, the staff has considered and performed an evaluation of additional information from several sources as part of preparing the final SEIS. Its findings are documented in Section 4.1. Similarly, additional information on environmental justice was also considered and evaluated in Section 4.4.6.

The following comments are opposed to comments brought up in public meetings being classified as out of scope or not being addressed:

73-h-AM/LR/ST; 96-b-LR/NE; 96-j-LR/PA/RW; 132-e-GI/LR; 137-e-LR; 164-d-LR/OM; 172-d-LR

Response: *The comments are opposed to the scoping criteria used by the NRC for the environmental review process. The NRC staff's review of license renewal applications addresses safety and environmental matters relevant to license renewal. The comments are general in nature and provide no new information related to the IPEC review. No change to the SEIS will be made as a result of these comments.*

The following comment is opposed to the time and money spent on the license renewal process for Indian Point:

117-c-LR/SR

Response: *The comments are opposed to the time and money spent on the license renewal process for IPEC. The NRC is responsible, in accordance with the Atomic Energy Act of 1954, as amended, to review operating license renewal applications such as the IP2 and IP3 LRA. The comments are general in nature and provide no new information. No change to the SEIS will be made as a result of these comments.*

The following comment states that the draft environmental impact statement did not adequately analyze the potential visual impact of cooling towers in the context of the Scenic Areas of State Significance (SASS) documentation:

4-b-AL/LR

Response: *The topic of cooling towers is considered an alternative which is discussed in chapter 8.1.1 under "Close Cycle Cooling Alternatives" of NUREG-1437, Supplement 38. The NRC's environmental review regulations implementing NEPA, in 10 CFR Part 51, require that the NRC consider reasonable alternatives to a proposed action before acting on a proposal, including consideration of the no-action alternative.*

IP2 and IP3 currently use a once-through cooling-water system that withdraws water from and discharges water to the Hudson River. The type of cooling system currently used by Indian Point is known to have a more adverse effect on the aquatic environment than cooling towers. On April 8, 2003, the New York State Department of Environmental Conservation – which holds authority under the Federal Clean Water Act to regulate pollutant discharge – proposed to modify the SPDES permit to require IP2 and IP3 reduce the impacts to aquatic organisms caused by the once-through cooling system. Accordingly, the alternative of a closed-cycle cooling system is considered in this SEIS.

Aesthetics was one of the impacts considered in the environmental review and as seen in Table 8.1 of NUREG-1437, Supplement 38 it is addressed. As stated in Table 8.1, construction of two towers that could stand 150-165 feet tall is considered to have a moderate impact. The height of these towers would have noticeable impact on the aesthetics of the site, while the existing once-through cooling system is considered to have a small impact on the aesthetics of the site.

A final decision has not been made by the State of New York on the building of cooling towers at IPEC. If a decision is made to build cooling towers at IPEC, construction and operation of those towers could require an NRC licensing action and a separate environmental evaluation.

The following comment is a general statement that the fuel storage disposal and groundwater contamination must conform to state standards:

4-c-LR/UF

Response: *The NRC's process for the license renewal of nuclear power facilities does involve substantial participation of state and local government agencies. The following requirements are contained in 10 CFR 51.71 (d):*

"Consideration will be given to compliance with environmental quality standards and requirements that have been imposed by Federal, State, regional, and local agencies having responsibility for environmental protection, including applicable zoning and land-use regulations and water pollution limitations or requirements issued or imposed under the Federal Water Pollution Control Act. The environmental impact of the proposed action will be considered in the analysis with respect to matters covered by environmental quality standards and requirements irrespective of whether a certification or license from the appropriate authority has been obtained. While satisfaction of Commission standards and criteria pertaining to radiological effects will be necessary to meet the licensing requirements of the Atomic Energy Act, the analysis will, for the purposes of NEPA, consider the radiological effects of the proposed action and alternatives."

Additional information about spent fuel is discussed in the Spent Fuel comment response section.

The comment does not present any significant new information that would warrant a change to the final SEIS.

The following comments request the SEIS to provide detailed analysis supported by data as to how the proposed licensing would impact coastal land and water uses:

4-d-CI/LR/SO; 4-e-LR

Response: *Information on land and water use can be found in section 2.2 "Plant Interaction with the Environment." Sections 2.2.1 through 2.2.8 provide general descriptions of the environment near IPEC, and detailed descriptions where needed to support the analysis of potential environmental impacts of refurbishment and operations during the renewal term. Land use is a one of many issues considered in the NRC environmental review.*

IPEC is located within the State's Coastal Zone which is regulated by the New York Coastal Management Program (CMP), and authorized by the Coastal Zone Management Act of 1972. The CMP includes a total of 44 policies which are applicable to development and use proposals within or affecting the State's coastal area. Activities related to the seeking of permits, licenses,

waivers, certification or similar types of approval from a Federal agency (such as relicensing of IPEC) within or affecting such areas are subject to reviews for consistency with these policies. The New York Department of State will conduct a separate consistency review for that process.

Section 2.2.5 of the draft SEIS, Aquatic Resources, describes the physical, chemical and biological characteristics of the Hudson River estuary as well as major anthropogenic events that have influenced the estuary and the history of regulatory action over the past 50 years. This section is sufficient for NRC decision-making purposes and provides a detailed discussion of how the current licenses have impacted coastal lands and water use.

The following comment consists of general statements questioning the NRC's role in development of the Environmental Impact statement:

16-d-LR

Response: *The Atomic Energy Act of 1954 (as amended) allows the U.S. Nuclear Regulatory Commission (NRC) to issue licenses for commercial power reactors to operate for up to 40 years. -NRC regulations allow for the renewal of these licenses for up to an additional 20 years beyond the initial licensing period depending on the outcome of an assessment to determine whether the reactor can continue to operate safely during the 20-year period of extended operation. The license renewal process includes reviewing the license renewal application, conducting a thorough assessment of the safety and environmental impacts of the proposed action, and if appropriate, renewing the license. The NRC's review of a license renewal application proceeds along two tracks: one for safety issues and another for environmental issues. The license renewal process is defined by a clear set of regulations that are designed to ensure safe operation and protection of the environment during the period of extended operation.*

The following comments are general statements expressing support for proceeding with the license renewal process:

26-a-EC/LR; 40-wwwww-GE/LR; 45-c-LR; 49-c-LR/SR; 94-a-LR; 116-c-LR/SR

Response: *The comments are supportive of the license renewal process. The comments are general in nature, provide no new information and, therefore will not be evaluated further.*

The following comment is opposed to the 60-day period in 2007 during which NRC provided an opportunity for interested parties to request an adjudicatory hearing:

137-n-LR

Response: *On October 1, 2007, the Commission extended the period in which interested parties could file requests for adjudicatory hearings through November 30, 2007. The Commission has acted to address this concern, and the time period for filing a timely petition to intervene has expired. The comments provide no new information and will not be evaluated further.*

The following comments request the relicensing to be contingent upon or postponed until all environmental issues and problems have been addressed:

137-m-LR; 139-g-LR

Response: *Many environmental issues are not within the NRC's regulatory authority to resolve. For example, environmental issues related to the facility's once-through cooling system are regulated, monitored, and permitted by the New York State Department of Environmental Conservation through the power delegated to the State under the Clean Water Act. While the NRC coordinates with other regulatory authorities, the NRC cannot address issues that are not under its jurisdiction. The NRC's responsibilities in the license renewal review include assessing and comparing environmental impacts from license renewal and other alternatives that meet the SEIS's applicable purpose and need.*

In cases where environmental issues are under the NRC's jurisdiction – such as those relating to radiation and radioactive materials – the NRC takes action to regulate those issues under the facility's current operating license separately from a license renewal review.

The following comments request a Blue Ribbon Commission/task force by the Governor of New York to address Indian Point concerns:

137-r-LR

Response: *This suggestion relates to requested action by New York's Governor and does not directly relate to the NRC's license renewal SEIS.*

The following comment requests an expedited timeline for the final license review:

166-a-LR/SR

Response: *The NRC staff's standard review timeline is 22 months for a review without an adjudicatory hearing, and 30 months for a review with an adjudicatory hearing. In the Indian Point review, however, the NRC staff has extended the schedule on several occasions to address review-related issues. The staff's acceptance letter included a 26 month schedule because Entergy needed to address an issue related to the facility's current licensing basis before NRC staff could continue its review. Since that time, an Atomic Safety and Licensing Board Panel has admitted numerous contentions for hearing, and the staff has extended its review schedule in order to address new information and the large numbers of scoping and draft SEIS comments. The NRC staff will continue to act in a deliberate and timely fashion.*

A.2.1.1 NEPA

The following comments state that the NRC has not taken the "hard look" as required by NEPA:

17-a-NE/SF; 17-q-AE/NE; 50-e-NE; 50-p-DE/EP/NE; 68-a-AL/NE; 79-d-LR/NE; 96-b-LR/NE; 137-c-NE

The following comments state that NEPA requires the reviewing agency to consider the impact on the environment resulting from the total effects of the contemplated action and other past, present and reasonable foreseeable future actions:

17-c-NE; 17-e-NE/PA; 17-n-NE; 17-o-AE/NE; 50-p-DE/EP/NE; 147-b-NE/PA; 152-e-NE; 174-e-NE/PA

The following are general comments stating that the EIS does not meet the minimum requirements of NEPA:

68-c-DE/EF/NE; 102-l-NE/PA; 132-b-NE; 180-g-NE/PA

Response: *The Atomic Energy Act of 1954 (as amended) allows the NRC to issue licenses for commercial power reactors to operate for up to 40 years. NRC regulations allow for the renewal of these licenses for up to an additional 20 years beyond the initial licensing period depending on the outcome of an assessment to determine whether the reactor can continue to operate safely during the 20-year period of extended operation. The license renewal process includes reviewing the license renewal application, conducting a thorough assessment of the safety and environmental impacts of the proposed action, and if appropriate, renewing the license. The NRC's review of a license renewal application proceeds along two tracks: one for safety issues and another for environmental issues. The license renewal process is defined by a clear set of regulations that are designed to ensure safe operation and protection of the environment during the period of extended operation.*

The NRC fully supports the principles of NEPA, which establishes a national policy that:

• encourages productive and enjoyable harmony between man and his environment,

• promotes efforts which will prevent or eliminate damage to the environment and biosphere and stimulate the health and welfare of man, and

• enriches the understanding of the ecological systems and natural resources important to the Nation.

The NEPA regulations adopted by the CEQ direct Federal agencies on matters related to environmental policy, including the public scoping process, use of lead agencies, and selection of alternatives. The NRC is an independent regulatory agency. As an independent agency, the NRC has established its own regulations to implement NEPA. The Commission's policy is to take account of the CEQ's regulations voluntarily. The NRC's requirements for compliance with NEPA are contained in 10 CFR Part 51, Subpart A; National Environmental Policy Act – Regulations Implementing Section 102(2).

NEPA does not require that a Federal agency choose the alternative with the least impact. Rather, NEPA requires that it discloses all potential impacts so that the decision the agency makes can be fully informed. NEPA does not require the review or analysis of actions other than the action being considered. For example, the NEPA review for license renewal would not include an environmental review of the existing operating license, a review of an independent spent fuel storage installation, or an analysis of a waste repository, each of which has its own separate NEPA review.

An EIS is a written analysis of the reasonably foreseeable effects of an activity on the environment, including the air, water, human health, animal life, vegetation, natural resources, aesthetics, and any resources of historic, archaeological, or architectural significance. The review also evaluates cumulative, socio-economic (including environmental justice), cultural, and other impacts.

Cumulative impacts on the environment result when impacts of an action are added to other past, present, and reasonably foreseeable future actions. Cumulative impacts can result from individually small impacts that become significant when taken collectively over a geographic area or a period of time. Any agency (Federal or non-Federal) or non-governmental entities can contribute through their actions or approvals to cumulative effects. These combined impacts are defined as "cumulative" and include individually minor but collectively significant actions taking place over a geographic area or a period of time.

The NRC evaluates cumulative effects during the site visit and scoping process by identifying the impacts that have affected the environment surrounding the facility. For example, the close proximity of another nuclear reactor facility or another industrial facility that also discharges warm water into the same river may have a cumulative impact on aquatic ecology that is greater than the impact of just one facility. The NRC staff would take into consideration the potential for cumulative impacts from such facilities.

The NRC recognizes a continuing obligation to conduct its domestic licensing and related regulatory functions in a manner which is both receptive to environmental concerns and consistent with the Commission's responsibility as an independent regulatory agency for protecting the public and the environment.

No changes have been made to the SEIS based on these comments.

A.2.1.2 GEIS

The following comments are opposed to the use of the GEIS due to the age of the document:

50-a-LR; 50-g-GE/SF; 96-a-GE/LR; 123-d-GE/SF; 123-f-GE; 128-c-GE/LR; 129-a-LR; 140-a-GE/LR;13-f-AM/GE/OM

Response: *The GEIS has been adopted by the NRC through the rulemaking process and continues to apply to IP2 and IP3 as well as other nuclear power plants undergoing license renewal review. The NRC will continue to evaluate new applications under the existing regulatory framework using the GEIS as previously published and codified in NRC's regulations. However, insights and information gained during the GEIS update process and from experience with completed license renewal reviews using the GEIS will be considered during the review of ongoing and upcoming applications until the update of the GEIS and appropriate revisions to 10 CFR Part 51 are completed.*

If a new issue emerges, it is first analyzed to determine whether it is within the scope of the license renewal evaluation. If a new environmental issue is determined to be within the scope of license renewal and it was not addressed in the GEIS or codified in the NRC license renewal environmental protection rule, the NRC evaluates the significance of the information by calling upon experts from within the NRC, its contractors or other recognized institutions. If the new issue is relevant only to a particular site, the NRC staff performs a site-specific analysis and includes its conclusion in the site-specific supplement to the generic environmental impact statement on license renewal (SEIS). If the new and significant information appears to be relevant to other sites, the NRC staff will consider the issue in future SEISs and include it as a candidate for evaluation in the periodic update of the GEIS and possible amendment to the rule.

The NRC has anticipated the need to revisit the GEIS and its implementing regulations. The Commission declared its intent to revisit the GEIS on a 10-year cycle to determine whether the technical bases or conclusions need to be updated. The GEIS represents a snapshot in time. Therefore, it is appropriate to periodically determine whether changes have occurred that should be included in an update to the GEIS. Science and conditions in the natural environment evolve, and the scientific community's understanding of issues, methods, and assumptions may need to be revisited. Experience gained in using the regulatory framework may identify situations in which new approaches or conclusions are appropriate. Changes in statutes, regulations, policies, and practices may have a cascading impact on the NRC licensing framework.

Currently, the GEIS for license renewal, which was originally issued in 1996, is being updated. The NRC is considering the public comments received on the draft GEIS and is considering the appropriate changes to the document. The final GEIS is scheduled to be issued in the first quarter of 2011.

The following comment states that there is a lack of Environmental Justice information within the GEIS:

113-c-EJ/GE

Response: *Environmental justice was not evaluated on a generic basis, because guidance for implementing Executive Order 12898 was not available prior to completion of the 1996 GEIS. Environmental justice impacts are addressed in plant-specific environmental reviews, and are discussed in Section 4.4.6 of this SEIS.*

The NRC staff is guided in its consideration of environmental justice in plant-specific environmental reviews by Office of Nuclear Reactor Regulation (NRR), Office Instruction LIC-203, Appendix C "Environmental Justice in NRR NEPA Documents." The environmental justice review involves identifying minority and low-income populations in the vicinity of the plant that may be affected by license renewal, including their geographic locations, any concerns and potential environmental impacts that may affect these populations, the significance of such concerns and effects, whether they would be disproportionately high and adverse when compared to the general population, and if so, the mitigation measures available to reduce and/or eliminate these impacts. The NRC staff performs the environmental justice review and reports the results of this review in the SEIS. This comment does not present any significant new information that would warrant a change to the final SEIS.

The following comment states that the GEIS is defective in determining the environmental impacts associated with components that cannot be fully inspected:

102-m-GE/OM

Response: *The NRC staff performs a safety review to determine whether there is reasonable assurance that activities authorized by the renewed license will continue to be conducted in accordance with the current licensing basis.*

The intent of the NRC staff's safety review is to determine if the applicant has adequately demonstrated that the effects of aging will not adversely affect any systems, structures, or components, as identified in 10 CFR 54.4. When the plant was designed, certain assumptions were made about the length of time the plant would be operated. During the license renewal process, the applicant must also confirm whether these design assumptions will continue to be valid throughout the period of extended operation and whether aging effects will be adequately managed. The applicant must demonstrate that the effects of aging will be managed in such a way that the intended functions of "passive" or "long-lived" structures and components will be maintained during extended operation. For active components, surveillance and maintenance programs will continue throughout the period of extended operation.

If additional aging management activities are needed, the applicant may be required to establish new monitoring programs or increase inspections. For instance, applicants should specify activities that need to be performed (such as water chemistry and inspections) to prevent and mitigate age-related degradation. These activities increase the likelihood that the program is

effective in minimizing degradation and that the component is replaced if specified thresholds are exceeded.

The regulations in 10 CFR Part 54 provide the basis for the NRC staff's safety review. Detailed guidance on the NRC staff's safety review for license renewal is provided in the Standard Review Plan for Review of License Renewal Applications for Nuclear Power Plants (NUREG-1800). The purpose of the Standard Review Plan is to ensure quality and uniformity in the staff's review and to present a well-defined basis upon which to evaluate the applicant's programs and activities for the period of extended operation. The Standard Review Plan was developed based on information in the Generic Aging Lessons Learned (GALL) Report (NUREG-1801), which was developed by the NRC with input from interested stake holders. The GALL Report documents the basis that is used for determining if existing programs are adequate or if they should be augmented for license renewal.

The focus of the license renewal safety review is on managing the detrimental effects of aging. The review provides reasonable assurance that the effects of aging will be managed for the period of extended operation such that systems, structure, and components (SSCs) will continue to perform their intended functions in accordance with the plant's current licensing basis. Many of the existing programs and regulatory requirements that already provide adequate aging management will continue to be applicable after renewal. The license renewal review focuses on the SSCs for which current activities and requirements may not be sufficient to manage aging in the period of extended operation.

These comments are specific to the GEIS and do not provide new information that would cause a change to the SEIS.

The following comment offers general support for the findings of the GEIS:

40-wwwww-GE/LR

Response: *This comment is in support of the findings of the GEIS and is general in nature. The comment provides no new information and, therefore will not be evaluated further. No change is the SEIS will be made as a result of this comment.*

A.2.2 Comments in Support of License Renewal for Indian Point Nuclear Generating Units 2 and 3

The following comments provide general support for license renewal:

8-a-SR; 36-e-OP/SO; 40-h-SR; 42-e-SR; 46-a-EC/SR; 48-e-OP/SR; 48-f-SE; 49-a-SR; 49-d-EJ/SR; 49-i-SR; 52-e-SR; 57-d-SL; 57-h-SE/SR; 58-a-SR; 65-a-SO/SR; 67-a-SR; 67-f-SR; 78-a-SR; 92-d-SO/SR; 92-g-SO/SR; 99-a-SR; 101-a-SR; 101-c-SO/SR; 105-a-SO/SR; 105-c-EC/SR; 108-b-AL/GI/SR; 111-b-SO/SR; 113-a-SR; 113-e-SR; 116-a-SO/SR; 116-c-LR/SR; 119-a-SR; 119-f-SR; 120-p-SR; 127-a-SA/SR; 127-c-AL/SR; 137-a-SA/SR; 144-a-EC/SA/SR; 148-b-AL/SO; 148-c-AL/SO; 150-d-EC/SR; 159-b-AL/SA/SR; 159-c-EC/SR; 159-e-AL/AQ/SR; 163-a-SE/SO/SR; 166-a-LR/SR; 166-d-SO/SR; 166-e-SO/SR; 168-a-OS

Response: *The comments support license renewal of Indian Point and are general in nature. The comments provide no new and significant information; therefore, no changes were made to the SEIS in response to these comments.*

The following comments support the license renewal due to the cumulative impacts of denial of the license renewal application:

7-d-AQ/EC/SR; 14-a-AQ/EJ/SR; 23-i-EC/SO/SR; 31-a-EJ/SR; 40-a-SR; 46-c-AL/EJ/SR; 62-a-EJ/SR; 78-c-SO/SR; 92-a-EC/SO/SR; 92-e-SO/SR; 108-a-EC/SO/SR; 109-d-SO/SR; 113-d-AQ/GL/SR; 131-c-SE/SR; 158-a-EJ/SR

Response: *The comments support license renewal of IP2 and IP3 due to the adverse potential effects of the denial of license renewal. Responses to the cited impacts are addressed in their respective comment response category. The comments provide no new and significant information; therefore, no changes were made to the SEIS in response to these comments.*

The following comments express support for license renewal due to the air quality associated with nuclear power plants versus alternative energy sources:

5-a-AQ/SR; 5-b-AQ/SR; 5-c-AQ/SR; 14-a-AQ/EJ/SR; 36-a-SR; 62-b-EJ/SR; 112-i-SR; 113-d-AL/AQ/SR; 113-l-SR; 118-a-AQ/EJ/SR; 119-j-SE/SR; 133-d-AL/AQ/SR; 146-c-AQ/SR; 177-d-AQ/EJ/SR

Response: *The comments support license renewal of IP2 and IP3 due to the positive effects on air quality. Responses to the cited impacts are addressed in the Air Quality section. The comments provide no new and significant information; therefore, no changes were made to the SEIS in response to these comments.*

The following comments are supportive of relicensing due to the availability of power from IPEC and the potential costs associated with alternatives:

8-b-SO; 19-a-EC/SR; 19-b-EC/SO/SR; 19-c-EC/SO/SR; 26-c-EC/SO/SR; 28-a-EC/SR; 31-c-AQ/SR; 49-c-LR/SR; 58-d-SR; 65-b-EC/SR; 65-c-EC/SO/SR; 85-a-EC/SO/SR; 88-b-EC/SR; 88-c-EC/SR; 118-b-EC/EJ/SR; 119-g-EC/SO/SR; 131-e-AQ/EC/SR; 133-a-EC/SO/SR; 157-d-EC/SR

Response: *The comments support license renewal of Indian Point due to the adverse potential utility costs of alternative energy. Responses to the cited impacts are addressed in the Energy Costs and/or Socioeconomic section. The comments provide no new and significant information; therefore, no changes were made to the SEIS in response to these comments.*

The following comments are supportive of license renewal due to the plants' positive impact on the community:

1-a-EC/SO/SR; 1-e-SR; 8-d-SE/SR; 23-a-SR; 23-g-SR; 29-a-SO/SR; 42-a-EC/SR; 42-d-SE/SR; 53-a-SE/SR; 57-g-SR; 85-c-EC/SO/SR; 130-b-OP/SO/SR; 131-d-SE; 131-e-AQ/EC/SR; 136-a-CR/SO/SR; 136-b-SO/SR; 148-a-AL/SO; 150-f-SO/SR; 156-a-SE/SR; 181-a-SE/SR

Response: The comments support license renewal of Indian Point based on the positive impact Entergy has on the community. Responses to the cited impacts are addressed in the socioeconomic section. The comments provide no new and significant information; therefore, no changes were made to the SEIS in response to these comments.

A.2.3 Comments in Opposition to License Renewal for Indian Point Nuclear Generating Units 2 and 3

The following comments express opposition to license renewal:

6-a-EP/OR/OS; 9-b-OE/OR/SA; 11-a-OR; 11-f-AL/OR; 12-a-OR; 13-a-OR; 13-h-OR; 15-a-OR; 18-a-LE/OR; 18-d-OR; 21-a-AE/LI/OR/SF; 21-b-GI/OR; 22-a-HH/OR/OS/PA; 24-a-HH/OR/RI; 24-b-HH/OR; 25-a-OR; 27-a-OR; 27-f-OR; 35-d-OR; 35-e-OR/RE; 37-a-AE/OR; 41-a-OR; 44-a-OR; 44-d-OR; 50-f-NE/OR; 54-a-LE/OR/RW; 54-d-OR; 61-a-AE/AL/OR; 63-a-OR; 63-g-OR; 66-a-GI/OR; 69-a-HH/LE/OR/PA; 70-c-OR; 70-d-OR; 72-a-EP/LE/OR/RW; 75-a-OR; 76-a-AE/LE/OR; 76-b-OR/PA; 77-a-AE/OR; 80-a-EP/OR/RW/ST; 80-c-OR/OS; 81-d-OR; 82-a-OR; 86-a-OR; 86-e-OR; 91-a-OR; 91-e-OR/RW/ST; 96-p-OR; 98-a-EP/OR/PA; 98-d-OR/RE; 100-a-OR; 110-a-OP/OR; 121-a-DE/OR; 121-c-OR/PA; 135-a-LE/OR; 143-a-GI/OR/RW; 141-a-OR; 141-d-AL/OR; 142-a-LE/OR; 145-f-DE/OR;147-d-OE/OR; 151-a-OR; 151-e-OR; 155-d-OR; 161-d-GI/OR; 161-i-AL/OR; 162-c-OE/OR; 162-f-OE/OR; 165-a-OR/PA; 167-b-OR/RW/SF; 170-a-OE/OR; 170-h-HH/OE/OR; 173-b-AL/OR; 174-j-OR; 175-a-OP/OR/PA; 182-a-LE/OR; 182-d-AL/EJ/OR; 176-a-OR; 176-f-OR; 179-h-OR/SA

Response: Portions of these comments that express general opposition to renewing the licenses for IP2 and IP3 provide no new and significant information and have not resulted in any changes to this SEIS. Portions of these comments that address particular technical issues are addressed in the respective technical sections of this appendix.

The following comments are opposed to nuclear energy:

38-a-ON; 70-a-ON; 84-c-ON

Response: The comments oppose license renewal of Indian Point and are general in nature. The comments provide no new and significant information; therefore, no changes were made to the SEIS in response to these comments.

A.2.4 Comments Concerning Surface-Water Quality, Hydrology, Groundwater, and Use Issues

The following comments indicate opposition to license renewal because of the continuing leaks of radioactive water into the groundwater and the Hudson River and the residual contamination of Cs-137 and Sr-90 into the Hudson River.

3-a-AE/LE/LR; 11-d-LE; 12-d-LE; 35-a-LE/OM; 37-b-LE/SF/ST; 41-c-AE/LE; 44-c-AE/LE; 47-b-LE/EP/SF; 61-b-LE/RW/ST; 63-d-LE; 69-a-HH/LE/OR/PA; 72-a-EP/LE/OR/RW; 74-a-LE; 75-b-EP/LE/OP/ST; 76-a-AE/LE/OR; 80-b-LE/RW/SF/ST; 91-d-LE; 106-a-AE/LE/RW/SF; 110-b-LE/WA; 121-b-AM/LE; 122-b-LE; 126-c-LE; 126-d-LE/RI

Response: *The dSEIS, in chapters 2 and 4, addressed the impacts of the radioactive material leaks. The NRC staff concluded that the calculated maximum dose to a member of the public exposed to all sources of radioactive material from IPEC was below NRC and EPA radiation dose limits. Additional information on the impacts from the leaks is contained in the Human Health response section.*

The following comment indicates that radioactive tritium released from IPEC is also found in nature and does not have a significant impact.

33-a-AE/GL/LE

Response: *It is true that tritium is a naturally occurring radioactive form of hydrogen. It is produced in the atmosphere when cosmic rays collide with air molecules. As a result, tritium is found in very small or trace amounts in groundwater throughout the world. It is also a byproduct of the production of electricity by nuclear power plants.*

The comment does not present any significant new information that would warrant a change to the final SEIS.

The following comment indicates that leaking radioactive material from IPEC, including Sr-90; are causing cancer and contaminating mother's milk.

39-b-LE; 73-b-EJ/LE; 96-d-HH/LE/RI

Response: *The comments are addressed in the Human Health section.*

The following comments indicate that the EIS does not adequately discuss the long term health impacts from the radionuclides leaking from the spent fuel pool into the groundwater and the Hudson River, including eating fish from the Hudson River.

73-c-EJ/HH/LE; 96-e-HH/LE/WA; 96-f-DC/LE/WA; 97-k-EJ/HH/LE; 98-c-HH/LE/RI

Response: *The NRC staff performed a site specific evaluation of the leaks of radioactive material at IPEC. The evaluation is contained in Chapters 2 and 4 of the dSEIS. The comments are addressed in the Human Health section.*

The following comments indicate that plant aging will cause an increase in the number of leaks.

71-c-LE/RW; 96-c-AM/LE/OM; 96-n-AM/LE

Response: *The NRC staff reviewed the issue of radioactive effluent releases from normal routine pathways and of the abnormal leaks from the spent fuel pools. There is a thorough discussion of these issues in Chapters 2 and 4 of the dSEIS that address the impacts to human health from routine and abnormal radioactive releases.*

As part of its review, the NRC staff reviewed five years of historical radioactive and radiological environmental monitoring data. Based on the data, the Staff concluded that the calculated doses to a member of the public from the normal and abnormal radioactive releases were within NRC's radiation dose standards. The environmental data showed some radionuclides associated with the operation of IPEC; however, residual radioactivity from atmospheric weapons tests and naturally occurring radioactivity were the predominant sources of radioactivity in the samples collected. The Staff concluded that IPEC operations did not result in an adverse impact to the public greater than environmental background levels.

The NRC staff also evaluated the impacts from the leaking radioactive material into the groundwater and into the Hudson River in Chapter 2. For the evaluation contained in the dSEIS, the NRC staff used information from an Inspection conducted by personnel from NRC's Region I office and NRC's Headquarters office. The NRC thoroughly inspected this issue at IPEC, starting with initial notification of the leaks in September 2005 and followed the issue until the inspection closed in May, 2008. The NRC Inspection Report (ADAMS Accession number ML081340425) made the following summary statement; "Our inspection determined that public health and safety has not been, nor is likely to be, adversely affected, and the dose consequences to the public that can be attributed to current on-site conditions associated with

groundwater contamination is negligible." In the body of the Inspection Report there are two key conclusions relevant to the potential human health impacts from the leaks. They are presented in Chapter 2 of the SEIS:

The NRC has already fully considered and addressed the issue in the SEIS and the comments do not present any significant new information or arguments that would warrant a change to the final SEIS.

The comment indicates that Indian Point took corrective action to identify and mitigate the leaks of Sr-90 and tritium, including installation of monitoring wells and continued inspection of the spent fuel pool for indications of leakage.

120-o-LE

Response: *The comment is noted. The comment does not present any significant new and significant information that would warrant a change to the final SEIS.*

A.2.5 Comments Concerning Aquatic Ecology, Terrestrial Ecology, General Ecology, and Threatened and Endangered Species

The following comments indicate that data on impingement and entrainment were collected at IP2 and IP3 between 1981 and 1990 and thus may be too old to be reliable, especially because differences in the fish populations been the 1990s and the present are great. The comments also indicate that no impingement or entrainment monitoring has been conducted since the installation of Ristroph screens.

17-q-AE/NE/OE; 21-a-AE/UF/OR/SF; 79-l-AE; 96-k-AE/OE/TS; 96-l-AE/AL/RG; 140-c-AE; 140-f-AE; 140-tt-AE; 140-uu-TS

Response: *The responsibility for requiring monitoring of entrainment, impingement, and thermal effects at IP2 and IP3 lies with New York State and not the NRC. In describing the available data and in its analysis, NRC staff described the age of the data from each of these in-plant monitoring programs and acknowledged the shortcomings of relying on such old data. The weight of evidence approach employed by the NRC included two primary lines of evidence: assessment of aquatic population trends in the Hudson River and an evaluation of strength of connection (i.e., relationship of the aquatic resources to power plant operations). NRC staff used population trend data available from 1974 or 1975, depending on the sampling program, through 2005 in its assessment. The staff also used impingement and entrainment data available from 1975 through 1990 to determine the strength of connection. Although entrainment and impingement monitoring was not conducted at IP2 and IP3 after 1990, NRC staff believes that sufficient information is available to determine the strength of connection between plant operations and aquatic resources in the Hudson River. These comments do not present the kind of new and significant information that would warrant a change in the final SEIS.*

The following comment suggests a change in the description of the fish return system discharge in SEIS Chapter 2.

40-k-AE

Response: *The text has been modified.*

The following comments indicate that NRC does not have sufficient data to assess thermal impact on aquatic resources.

128-n-AE; 140-g-AE; 140-uu-TS

Response: *The NRC staff agrees that limited data are not available to address potential thermal impacts to the aquatic resources in the Hudson River. The staff acknowledged the uncertainties related to thermal effects in Section 4.1.4 and recommended that a thermal study be conducted. In the final SEIS, the NRC expressed the uncertainty arising from the lack of both studies and data as a range of impact levels from Small to Large and observed that the level of impact level could be refined when more data become available. The responsibility insuring that thermal discharges from IP2 and IP3 meet New York State water quality criteria for protection of aquatic life lies with New York State and not the NRC*

The following comments indicate that sufficient data are not available to limit thermal impacts to small to moderate.

128-k-AE; 140-xx-AE; 140-c-AE

Response: *NYSDEC has the regulatory authority for thermal discharges, has stated that the applicant has exceeded thermal limits in the past, and has concluded that thermal impacts could be large, The NRC staff has concluded that thermal impacts could range from small to large for selected species and has revised the final SEIS to reflect this conclusion.*

The following comments indicate that the NRC staff's approach to assessing impact to fish populations differs from the NYSDEC's, which focuses on fish mortality rather than fish populations and finds significant adverse impact.

128-f-AE; 128-g-AE; 140-c-AE; 140-d-AE; 140-h-AE; 140-k-AE

Response: *NRC staff acknowledges that its approach to assessing aquatic impacts differs from DEC's. The difference is associated with the regulatory frameworks followed by each agency. The NRC staff assessed impacts with respect to resource stability. To address resource stability, it is appropriate to assess population trends of representative, important species that occur near the site. The staff assessed population trends using appropriate statistical techniques and explained the methods and results in technical appendices accompanying the draft SEIS and Chapter 4. This methodology used by the staff produces results that are directly applicable to the NRC categories of small, moderate, and large levels of impact.*

The following comments indicate that trend analyses for aquatic resources assume a normal distribution of abundance, whereas population abundance is often not normally distributed and is often log-normally distributed. The NRC staff model operates about equally for normal and lognormal distributions.

140-tt-AE; 40-qqqqq-AE

Response: *NRC staff acknowledges that fish population data from the Hudson River are not normally distributed and that these data often contain large numbers of zero abundance observations and a few observations of high abundance. To develop a measure of abundance to assess trends through time, the staff chose to analyze the 75th percentile of the weekly catches for each year. The advantage of this approach over the use of a mean of untransformed or log-transformed data is that the 75th percentile allows each observation to*

influence the result equally. In contrast, the use of the mean (average) of untransformed or log-transformed data can result in small (or large) catches having unequal or arbitrary influences on the result. The staff explains and discusses its rationale for the choice of the 75th percentile and the advantage of using this approach in a dynamic system influenced by multiple stressors in Appendix I, Section I.2.1 Assessment of Population Trends. NRC staff added text to clarify the approach and rationale to the final SEIS in Appendix H, Section H.1.3, Combined Effects of Impingement and Entrainment.

The following comments indicated that, in assessing population trends, the NRC staff 's test that 40 percent of observations lie outside the standardized mean abundance level observed over the first 5 years of the long-term study make it harder to score a large potential impact if unusually great variability occurred within those first 5 years.

140-d-AE; 140-tt-AE

Response: *Appendix I of the SEIS, Section I.2.1, Assessment of Population Trends, provides a description of the process used to develop standardized data. The NRC staff standardized abundance data by subtracting the first five year mean of the 75th percentiles of the weekly abundance data within each year and dividing this number by the standard deviation based on all years. This standardization allows comparisons of all fish species across years on the same scale. Staff chose the first five years for the mean to represent a short period of time closest to the start of operation of IP2 and IP3.*

The decision rule in the draft SEIS was intended to incorporate a population-level response with respect to the variance (noise) present in the system. In response to comments received and further investigation, the NRC Staff refined the population trend weight of evidence assessment by altering the decision rules in the final SEIS. The rationale for using increased population fluctuations was based on several sources. For example, Pimm et al. (1988) found that the risk of extinction for populations on islands correlated with temporal variability of the populations: populations most likely to become extinct had high variability, and Anderson et al. (2008) reported that fish populations stressed by fishing fluctuate more than unharvested stocks. The increased population fluctuations arise from the unstable population dynamics brought about by changing demographic parameters such as intrinsic growth rates. The presence of extreme population fluctuations is one of several criteria used by IUCN (2000) to assess vulnerability to extinction when considering candidate species for the Red List. For these reasons, the staff selected increased population fluctuations as a measure of ecological instability in the draft SEIS.

Some observations, however, suggest that using increased population fluctuations adds little to the use of trend alone. In discussing reddened spectra of biological population fluctuations, Pimm (1992, page 95) observes: "Any process that creates a trend in density will cause the population's variability to increase." Because of this, increasing population fluctuations may indicate a recovering population rather than an unstable one. In the general case where population variance increases as the mean, as the mean of a recovering population increases, the variance will also increase. Increasing variance accompanying an increasing trend could then signal a recovering population, not an unstable population. O'Grady et al. (2004) compared 16 measures frequently used to predict extinction risk in vertebrate populations and found that population size and trend were the best correlates of extinction risk and that variability in population size contributed little more to prediction. NRC staff interprets extinction risk as an indicator of ecological instability and a large level of impact.

The observations of Pimm (1992) and O'Grady et al. (2004) suggest to NRC staff that use of increased population fluctuations in addition to population trend adds little to determining if Hudson River fish populations are unstable and could be removed from the analysis. Removal would satisfy the commenters' objections, result in only a small change in sensitivity, and simplify the analysis. Therefore, NRC staff modified the decision rule in the final SEIS and removed the criterion that 40 percent of observations lie outside the standardized mean abundance level observed over the first 5 years of the long-term study. The revised method appears in the final SEIS in Appendix H, Section H.1.3 Combined Effects of Impingement and Entrainment.

Literature Cited in Response

Anderson, C.N.K., C.H. Hsieh, S.A. Sandin, R. Hewitt, A. Hollowed, J. Beddington, R.M. May, and G. Sugihara. 2008. Why fishing magnifies fluctuations in fish abundance. Nature 452(17):835-839.

IUCN (International Union for Conservation of Nature). 2000. IUCN Red List Categories and Criteria, Version 3.1. Species Survival Commission, IUCN, Gland, Switzerland. Available URL http://intranet.iucn.org/webfiles/doc/SSC/RedList/redlistcatsenglish.pdf

O'Grady, J.J., D.H. Reed, B.W. Brook, and R. Frankham. 2004. What are the best correlates of predicted extinction risk? Biological Conservation 118:513-520.

Pimm, S.L. 1992. The Balance of Nature? Ecological Issues in the Conservation of Species and Communities. University of Chicago Press, Illinois.

Pimm, S.L., H. L. Jones, and J. Diamond. 1988. On the risk of extinction. The American Naturalist 132(6):757-785.

The following comments observe that NRC assesses river-wide, river segment 4, and coastal trends of abundance in their weight-of-evidence score, while indicating that some species do not complete their life cycle in river segment 4; therefore, the comments indicate that there is no justification for including that geographic region in the analysis. Riverwide abundance trends are more relevant than Region 4 trends and marine species are not susceptible to impacts from IP2 and IP3.

140-d-AE; 140-tt-AE

Response: *The RIS include fish that are resident, migratory within the estuary and migratory along the coast. In the draft SEIS, NRC staff used river segment 4, river-wide, and coastal trends as valid measures of changes in fish populations at different scales and distances from IP2 and IP3 and weighted the three measures as to biological relevancy for assessing impacts of IP2 and IP3. NRC staff believes that impacts to fish species closest to the plant are the most biologically relevant, because as distance from the plant increases, the effects associated with the plant are more difficult to discern. NRC staff also recognizes that coastal trends are fundamentally different than the other two trends, however. River-wide and River Segment 4 populations are young-of-the-year (YOY) fish sampled with the same Hudson River fish survey programs. The coastal populations represent both the progenitors of the YOY and, typically, the YOY fish themselves years later as adults. Coastal population trends are based on commercial and recreational landings and subject to a wide variety of influences. NRC staff therefore accepted the comments, removed coastal population trends as an equal measure with river-*

wide and River Segment 4 trends, and used the coastal trends as ancillary information in interpreting impact. The revised method appears in the final SEIS in Appendix H, Section H.1.3 Combined Effects of Impingement and Entrainment.

The following comments indicate that NRC staff's use of a 3-year moving average prior to analysis in the methodology used to classify aquatic impacts into small, moderate, and large results in the classification process being less able to distinguish moderate from small impact levels when the methodology is tested using one hypothetical population model in a Monte Carlo simulation.

40-ccccc-AE; 40-qqqqq-AE

Response: *Changes to the decision rules associated with population trend line of evidence discussed in earlier comment responses reduce the probability of misclassification. These changes are discussed in Chapter 4 and Appendix H of the final SEIS. NRC did not change the three-year moving average in the final SEIS because it does not affect the probability of misclassification using the new decision rules.*

The following comments indicate that testing the methodology used to by NRC staff to classify aquatic impacts into small, moderate, and large using one hypothetical population model in a Monte Carlo simulation showed that different sets of rules produced different classifications with the same data. No classification scheme should be used without testing its performance on data with known characteristics.

40-ccccc-AE; 40-qqqqq-AE

Changes to the decision rules associated with population trend line of evidence discussed in an earlier comment response reduce the probability of misclassification.

The following comment indicates that the near-field (River Segment 4) and river-wide analyses that NRC staff conducted using densities, catch per unit effort, and abundance indices are not independent because some of the same data are involved in these analyses. All of the data are subject to sampling errors and other sources of variability. Performing different statistical analyses on data sets that are underlain by some of the same data increases the likelihood that at least one index, purely by chance, will suggest a moderate or large impact level.

40-aaaaa-AE

Response: *River-wide indices are weighted by the volume (FSS) or area (BSS) sampled within each river segment. River Segment 4 is one of the smaller weighted segments, and its contribution to the population trends is greatly diluted in the river-wide analysis. So although River Segment 4 data are included in the river-wide analysis, the two analyses are uncorrelated. This comment does not present the kind of new and significant information that would warrant a change in the final SEIS.*

The following comment indicates that NRC staff used statistical criteria to define instability for classifying impact levels as small, moderate, or large. Defining instability in a different way could change the conclusions.

40-bbbbb-AE

Response: *Changes to the decision rules associated with population trend line of evidence discussed in an earlier comment response.*

The following comment indicates that NRC provided no rationale for truncating all Hudson River data sets used in its analysis to a common length of 27 years.

40-ddddd-AE

Response: *Decisions concerning the truncation of the Hudson River data sets were based on the sampling design. The intent was to create a standardized set of information that could be used to compare across years. No change.*

The following comment indicates that NRC staff used a visual inspection of pre- and post 1985 Fall Shoals Survey (FSS) data and relative agreement between FSS and Beach Seine Survey (BSS) data to determine whether to analyze the FSS data set as a single or separate time periods. The differences in patterns were not apparent.

40-eeeee-AE

Response: *To address this comment, the NRC staff has employed a nonparametric sign test to test for differences in abundance patterns with respect to the gear change that occurred during the FSS. In addition, figure symbols associated with Appendix I, Section I.2.1 have been modified to improve clarity.*

The following comment indicates that, when NRC staff's regression analysis did not converge, NRC sometimes attempted to achieve convergence by eliminating outliers, even though there the staff had no independent reason to suspect that the data point was not a valid observation of abundance. Discarding an outlier point may help the algorithm converge to a solution that appears to be statistically significant even though in reality a significant trend is not present.

40-fffff-AE

Response: *NRC Staff presented the analyses in the draft SEIS with and without the outliers and found no differences in the conclusions. This comment does not present the kind of new and significant information that would warrant a change in the final SEIS.*

The following comment indicates that the analytical software NRC staff used to estimate trend lines apparently provides little opportunity to adjust the solution of the algorithm by changing initial values, search methods, step sizes, or convergence criteria. Using software that allows the statistician to fine-tune the algorithm would have been preferable to discarding outlier data points in order to achieve convergence.

40-ggggg-AE

Response: *The software chosen by the NRC Staff (PRISM Version 4) is specifically designed to perform nonlinear estimations. The Staff believes the choice of this software is appropriate for its intended use. NRC Staff has provided a table of initial values in the FSEIS so others can reproduce the information contained therein.*

The following comment indicates that trend estimates, mean square error (MSE), and statistical probabilities for the segmented regression used by NRC staff are not necessarily unique. The comments attempt to duplicate the analyses that NRC staff used on the abundance index data set and produced the same results as NRC staff achieved for some data sets but not others. The differences suggest that NRC's selection of either the linear or segmented regression based on which method achieved the lowest MSE

may not always have been correct. It is not clear that this would lead to different impact classifications for any of the data sets, but a potential for different results exists.

40-hhhhh-AE

Response: *NRC staff has provided a table of initial values in the FSEIS so others can reproduce the information contained therein. The NRC staff has evaluated the sensitivity of the initial values to the results and presented the information in the final SEIS, Appendix I, Section I.2.1.*

The following comments indicate that the effect of using a proportional rank abundance in the strength-of-connection analysis is to reduce the assigned level of impact on abundant, commonly-caught fish.

140-c-AE; 140-tt-AE

Response: *Based on new information provided by Entergy in its comments and on the comments of others on the DSEIS, the NRC Staff developed an alternative approach to assessing strength-of-connection that does not rely on proportional rank abundance. Information of this alternative analysis is found in the final SEIS, Appendix H, Section H.1.3, Combined Effects of Impingement and Entrainment, and Chapter 4.*

The following comments indicate that another effect of using a proportional rank abundance in the strength-of-connection analysis is that each species in not fairly assessed on its own merits.

40-nnn-AE; 128-h-AE/AL; 140-c-AE; 140-d-AE; 140-e-AE; 140-tt-AE

Response: *Based on new information provided by Entergy in its comments and on the comments of others on the draft SEIS, NRC staff developed an alternative approach to assessing strength-of-connection that does not rely on proportional rank abundance. Information concerning this alternative analysis is found in the final SEIS, Appendix H, Section H.1.3, Combined Effects of Impingement and Entrainment, and Chapter 4.*

The following comment indicates that the effect of using a proportional rank abundance in the strength-of-connection analysis when tested with a Monte Carlo simulation is to increase the probability that at least one species would erroneously be assigned a large strength of connection level.

40-iiiii-AE; 40-rrrrr-AE

Response: *Based on new information provided by Entergy in its comments and on the comments of others on the draft SEIS, NRC staff developed an alternative approach to assessing strength-of-connection that does not rely on proportional rank abundance. Information concerning this alternative analysis is found in the final SEIS, Appendix H, Section H.1.3, Combined Effects of Impingement and Entrainment, and Chapter 4*.

The following comments indicate that NRC staff used two comparisons of fish densities in the strength-of-connection analysis: impingement density vs. river density in river region 4 and entrainment density vs. river density in river region 4. Data used to make such comparisons must be consistent, and NRC staff used inconsistent or inappropriate data. An alternative method that resolves the inconsistencies results in all species having a moderate strength of connection (where adequate data allow calculation).

40-iiiii-AE; 40-sssss-AE

Response: *NRC Staff addressed these inconsistencies based on new information provided by Entergy in its comments on the DSEIS. The staff revised the final SEIS, Appendix H, Section H.1.3, Combined Effects of Impingement and Entrainment, and Chapter 4 to reflect the incorporation of this new information.*

The following comments indicate that the strength-of-connection analysis relies on an unsubstantiated and unproven assumption that the cooling water system has no impact on invertebrate species that are prey to fish. This assumption affects analyses of impingement, entrainment, and heated discharge water and makes low to moderate levels of impacts for most species almost inevitable.

140-e-AE; 140-tt-AE; 140-yy-AE

Response: *The GEIS addresses impacts to invertebrates from nuclear plant operations and concludes that the level of impact is small. No site-specific information was available for Indian Points Units 2 and 3. Based on comments on the DSEIS, the NRC Staff developed an alternative approach to assessing strength-of-connection that does not rely on the indirect effects of the loss of prey on predator species. Appendix H, Section H.1.3, Combined Effects of Impingement and Entrainment, and Chapter 4 have been revised in the final SEIS to reflect these changes.*

The following comment indicates that the strength-of-connection line of evidence used by NRC staff includes measures relating to the impingement and entrainment of fish species that are prey of the Representative Important Species. The NRC staff supports the claim using literature citations. The literature supports a conclusion that such indirect effects are possible but not certain. Because of high uncertainty concerning indirect effects of prey entrainment, NRC should assign the measure a lower weight.

40-uuuuu-AE

Response: *Based on new information provided by Entergy in its comments and on the comments of others on the draft SEIS, the NRC Staff developed an alternative approach to assessing strength-of-connection that does not weight the indirect effects of prey entrainment or impingement. Information concerning this alternative analysis is found in the final SEIS, Appendix H, Section H.1.3, Combined Effects of Impingement and Entrainment, and Chapter 4.*

The following comment indicates that NRC staff asserts that the loss of prey can have a large impact on predator species, while papers cited by NRC do not substantiate this assumption.

40-n-AE/ED; 40-mmm-AE; 40-uuu-AE; 40-uuuuu-AE

Response: The NRC staff cited papers in the final SEIS Section 4 and Section H.1.3 that show that loss of prey can affect predators.

The following comment indicates that the NRC staff calculated entrainment and impingement density metrics as the number of organisms divided by the number of samples instead of by water volume withdrawn. The metrics are confounded by interannual variation in sampling effort independent of the volume withdrawn.

40-sssss-AE

Response: *Based on new information provided by Entergy in its comments on the DSEIS, the NRC Staff developed an alternative approach to calculating the density of entrainment or impingement that removes the confounding of interannual variation in the volume of water withdrawn and sampling effort. Information concerning this alternative approach is found in the final SEIS Appendix H, Section H.1.3, Combined Effects of Impingement and Entrainment, and Appendix I, Section I.2.2, Analysis of Strength of Connection.*

The following comment indicates that the draft SEIS treats impingement and entrainment as equally likely to affect aquatic resources, but available information demonstrates that impingement impacts are relatively insignificant. Conflating the assessments of entrainment and impingement substantially overstates the impacts of impingement on the Hudson River fish community. Impingement and entrainment should be analyzed separately because impingement impacts are Small for all representative and important species post screen installation. Both NYSDEC and USEPA accepted screens as the best technology available in 1993. An agreement was drafted to include verification monitoring, but River Keeper did not sign it, and thus, the owners were under no obligation to perform the verification monitoring.

40-ee-AE/OE; 40-wwww-AE

Response: *Based on new information provided by Entergy in its comments and on the comments of others on the draft SEIS, the NRC Staff developed an alternative approach to assessing strength-of-connection that does not weight the effects of entrainment or impingement. Information concerning this alternative analysis is found in Appendix H, Section H.1.3, Combined Effects of Impingement and Entrainment, and Chapter 4.*

The following comment indicates that NRC has confused mortality and survival rates of fish impinged on the Ristroph screens.

128-h-AE/AL

Response: *The text of the final SEIS has been corrected.*

The following comment asks about the origins of bluefish impingement mortality rate data.

128-h-AI/AL

Response: *Based on new information provided by Entergy in its comments and on the comments of others on the draft SEIS, the NRC staff revised the strength of connection analysis in the final SEIS, and the estimates of CIMR used in revised analysis account for impingement survival. Information of this alternative analysis is found in Appendix H, Section H.1.3, Combined Effects of Impingement and Entrainment, and Chapter 4.*

The following comment indicates that ConEd and NYPA (1992) reported mortality rates for rainbow smelt impinged on Ristroph screens.

128-h-AE/AL

Response: *Impingement survival (96 h) for rainbow smelt was estimated in 1978 from 2 fish collected at IP1 as 0% survival (Texas Instrument Inc. 1979) and again in 1985 from 135 fish collected at IP2 as 85.7% survival (Consolidated Edison Co. 1985). The reference in the comment (NYPA 1992) was not complete and the NRC staff could not locate it. The NRC staff*

revised the strength of connection analysis in the final SEIS, and the estimates of CIMR used in revised analysis account for impingement survival. See the final SEIS, Appendix I, Section I.2.2, Analysis of Strength of Connection for further details.

Literature Cited in Response

Consolidated Edison Company of New York, Inc. 1985. Biological Evaluation of a Ristroph Screen at Indian Point Unit 2. Prepared by Consolidated Edison Company of New York, Inc., New York, New York.

Texas Instruments, Inc. 1979. Collection Efficiency and Survival Estimates of Fish Impinged on a Fine Mesh Continuously Operating Traveling Screen at the Indian Point Generating Station for the Period 8 August to 10 November 1978. Prepared for Consolidated Edison Company of New York, Inc., New York, New York. Prepared by Texas Instruments, Inc., Science Services Division, Dallas, Texas.

The following comment indicates that the draft SEIS accurately characterizes the methods used to monitor impingement losses at IP2 and IP3 but does not fairly characterize the efforts made at IP2 and IP3 to develop, demonstrate, and install effective technologies for minimizing impingement losses.

40-d-AE; 40-ll-AE/ED; 40-wwww-AE

Response: The *NRC staff's intent is to provide an overview of the efforts made at IP2 and IP3 to minimize impingement losses, not to describe in detail the entire process or its history. Because the information provided in this comment is available in the Final SEIS, it will be publicly available and assessable. No changes were made in response to this comment.*

The following comments indicate that the NRC staff reviewed but did not apply Fletcher's survival estimates for Ristroph screens and fish return system to adjust impingement loss totals based on the rationale that no verification modeling or validation of the installed system had been performed. Application of those survival estimates to estimated impingement losses would reduce the estimated impingement losses.

40-cc-AE/ED/OE; 40-yyy-AE; 40-zzz-AE; 40-xxxx-AE

Response: *The NRC Staff did not use the Fletcher's preliminary estimates in the draft SEIS because they were not validated through full-scale field tests. Based on new information provided by Entergy in its comments and on the comments of others on the draft SEIS, the NRC staff developed an alternative approach that incorporates Fletcher's preliminary estimates as part of conditional mortality rates in the strength of connection. Information of this alternative analysis is found in Appendix H, Section H.1.3, Combined Effects of Impingement and Entrainment, and Chapter 4.*

The following comment indicates that, because entrainment sampling was inconsistent over years, only weeks 18-32 should be used.

40-vvvvv-AE

Response: *Some taxa were mainly caught during weeks 1-16 and, to maintain that information, the staff used all entrainment sampling weeks in the final SEIS analysis.*

The following comment indicates that the Representative and Important Species (RIS) analyzed in the draft SEIS appear to be those whose abundance and distribution were detailed in the 1999 DEIS prepared by the Hudson River utilities (CHGEC et al. 1999). That list is broader than the original "Resident Important Species" [no reference given]. Expansion of the analysis to include additional species that are not typically subject to impingement and entrainment at IP2 and IP3 increases the chances of false positive instances of large impact levels.

40-p-AE; 40-zzzz-AE

Response: *These comments are correct that the NRC staff used the list of RIS from the 1999 DEIS. NRC staff believes that the RIS should include a broad range of physiologies, trophic relationships, body sizes, migratory behaviors, commercial values, recreational interests, ecological services, and other characteristics in order to best represent the aquatic resources of the Hudson River. No changes have been made as a result of this comment.*

The following comments indicate that Appendix D of Entergy's Biology Team Report contains an extensive and complicated analysis based on the NRC staff's weight-of-evidence analysis with eight major changes to assumptions and methodology.

40-q-AE/OE; 40-ff-AE; 40-mmm-AE; 40-ppp-AE/CE; 40-vvvv-AE; 40-jjjjj-AE; 40-kkkkk-AE; 40-ttttt-AE

Response: *The eight major changes suggested in the comment are presented below along with the the NRC staff's response:*

1. Elimination of inconsistencies in the trends analysis and in analysis of diet preferences for some RIS.

> *The NRC Staff believes this comment refers to the strength of connection analysis, not the trend analysis. Based on new information provided by Entergy in its comments (and the comments of others) on the draft SEIS, the NRC Staff developed an alternative approach that uses impingement and entrainment data to provide ancillary information concerning the strength of connection*

2. Reweighting of the lines of evidence used in the population trends analysis to account for the fact that river-wide abundance trends are more relevant measures of population status than are abundance trends in the immediate vicinity of IP2 and IP3.

> *This comment refers to providing more weight to the river-wide population trend data and less to the River Segment 4 data. The NRC staff believes that impacts to fish species closest to the plant are the most biologically relevant, because as distance from the plant increases, the effects associated with the plant are more difficult to discern. The staff modified the analysis to remove coastal commercial and recreational trends from the population trend analysis and to use those data as ancillary trend information. See final SEIS Appendix H, Section 1.3 Combined Effects of Impingement and Entrainment and in Chapter 4.*

3. Adjustment of the population trends WOE scores for marine species to account for the fact that many or most members of these populations never enter the Hudson River and are not susceptible to entrainment or impingement at IP and IP3.

Juvenile forms of marine migratory species are part of the Hudson River ecosystem and were the primary focus of the trend analysis. No changes were made to the FSEIS.

4. Reweighting of the lines of evidence used in the strength of connection (SOC) analysis to account for the low impact of impingement relative to entrainment (section 2 of this report) and the high uncertainty associated with predictions concerning the importance of indirect effects.

Based on new information provided by Entergy in its comments (and the comments of others) on the DSEIS, the NRC staff developed an alternative approach that uses impingement and entrainment data to provide ancillary information concerning the strength of connection. Information concerning this alternative analysis is found in Appendix H, Section H.1.3, Combined Effects of Impingement and Entrainment and in Chapter 4.

5. Inclusion of the attribute scaling factors developed by Menzie et al. (1996) to accord more weight to attributes that are closely related to determination of causation.

Menzie et al. (1996) suggested that attributes may or may not be scaled: "The 11 attributes can either be assigned equal importance or they can be scaled to reflect their relative importance in weighting measurement endpoints." No changes were made to the FSEIS.

6. Inclusion of the "availability of objective measures" attribute from Menzie et al. (1996) to accord more weight to attributes that directly measure quantities of interest for impact assessment.

As noted in the technical information provided with the comment, this attribute would be scored equally for each measurement and would not alter the final weights. No changes were made to the FSEIS.

7. Modification of the impact category assignment scheme to eliminate a bias inherent in the scheme used in the DSEIS.

The NRC staff set up the 1, 2, 4 weighting and decision rules to give more weight to a large impact (if it occurred). No changes were made to the FSEIS.

8. Addition of two additional lines of evidence to the SOC analysis, to more directly address direct and indirect impacts of entrainment and impingement on Hudson River fish populations.

Based on new information provided by Entergy in its comments (and the comments of others) on the DSEIS, the NRC staff developed an alternative approach that uses impingement and entrainment data to provide ancillary information concerning the strength of connection. This approach incorporated elements of conditional entrainment mortality rate (CEMR) and conditional impingement mortality rate (CIMR) in the assessment.

The following comments indicate that the approach used by Entergy's consultants in their Adverse Environmental Impact (AEI) Report is more scientifically rigorous and defensible and provides a stronger foundation for environmental decision-making than the NRC staff's weight of evidence (WOE) approach.

40-z-AE; 40-bb-AE/ED; 40-uu-AE; 40-kkkkk-AE; 40-lllll-AE

Response: *Entergy's consultants' AEI Report (Barnthouse et al. 2008) used an approach with multiple lines of evidence and population trend analyses. In their comments on the draft SEIS, Entergy's consultants (Barnthouse et al 2009) compared their AEI approach with the NRC staff's WOE approach showed similarities and differences, and presented an alternative WOE approach to that used by the NRC staff. Based on new information provided by Entergy in its comments and on the comments of others on the draft SEIS, the NRC revised the Weight of Evidence approach in the final SEIS to include improved data and an improved WOE approach that addresses comments submitted by Entergy's consultants and others. The NRC staff believes that its WOE approach provides an independent, strong, and scientifically rigorous and defensible analysis that fulfills the needs of NEPA and NRC's regulations.*

Literature Cited in Response

Barnthouse, L.W., D.G. Heimbuch, W.V. Winkle, and J. Young. 2008. Entrainment and Impingement at IP2 and IP3: A Biological Impact Assessment. Prepared for Entergy Nuclear Operations, Inc., Indian Point Nuclear Generating Unit Nos. 2 and 3. January 2008. ADAMS Accession No. ML083360704.

Barnthouse, L.W., D.G. Heimbuch, M. Mattson, and J.R. Young. 2009. Review of NRC's Impingement and Entrainment Impact Assessment for IP2 and IP3. March 2009. ADAMS Accession No. ML080390059.

The following comment indicates that only 7 of the 11 attributes defined by Menzie (1996) were used in WOE analysis and all had equal weight.

40-vvvv-AE

Response: *The strengths of the WOE analysis proposed by Menzie et al. (1996) include flexibility and adaptability, and those authors discuss use of alternate attributes and equal weighting. NRC explains its use of attributes, weighting, and rational for weighting in Appendix H.*

The following comment indicates that an alternative WOE approach including a CMR based determination of causation would be preferable.

40-vvvv-AE

Response: *Based on new information provided by Entergy in its comments and on the comments of others on the draft SEIS, the NRC revised the Weight of Evidence approach in the final SEIS to now include CMR.*

The following comments indicate that Indian Point must do as little damage as possible to an already stressed system, and thus minimize cumulative impacts.

140-z-AE/CI; 140-vv-AE; 140-ww-AE/CI

Response: *The cumulative impacts analysis in the final SEIS describes the impacts of IP2 and IP3 when added to or interacting with other effects in the Hudson River over the period of license renewal.*

The following comment indicates that the Pisces (2007) report on entrainment, impingement, and thermal impacts shows that Indian Point's operation caused temperature increases that have had significant effects on aquatic life.

140-l-AE

Response: *The NRC staff's conclusion in the final SEIS includes this possibility in the range of impact levels.*

The following comment indicates that the applicant failed to demonstrate that it meets New York State's water quality standard for thermal impacts or that it has received a waiver pursuant to Clean Water Act 316(a).

128-j-AE

Response: *Permitting and enforcement of these matters are under the jurisdiction of New York State. This comment does not present the kind of new and significant information that would warrant a change in the final SEIS.*

The following comment indicates that the NRC staff has no basis to reach different conclusions than the State of New York on thermal impacts from the discharges of Indian Point.

128-j-AE; 128-l-AE

Response: *The NRC staff's analysis and conclusions are presented for the purposes of satisfying NEPA with regard to the NRC decision regarding whether to renew the Indian Point operating licenses. The State of New York holds permitting power for the facility with regard to regulating facility discharges under the Clean Water Act. NRC assessments for NEPA purposes do not supersede judgments by the State of New York. The NRC staff notes that Indian Point continues to operate under a SPDES permit originally issued in 1987, and that New York State has yet to issue a new permit that reflects its expressed concerns regarding impact levels. The NRC staff has re-examined the data used to limit the range of impact levels and expanded the range of possible thermal impact levels to include large, which is the conclusion reached by New York State and DOI in their comments. For details, see final SEIS, Section 4.1.4.5, NRC Staff Assessment of Thermal Impacts.*

The following comment indicates that the NRC staff has reported the conclusory misstatements of the applicant in regard to thermal impacts.

128-m-AE

Response: *In the section referred to by this comment, the staff describes the history of thermal effluent compliance, not assessing impact Impacts are assessed elsewhere in the SEIS. This comment does not present the kind of new and significant information that would warrant a change in the final SEIS.*

The following comment indicates that language in the draft SEIS at page 2-35 regarding tidal conditions and thermal plume should be changed.

40-rrrr-AE

Response: *This comment refers to Section 2.2.5.1, the Hudson River Estuary, which is a general description of the estuary. The change would add more detail, but would not*

substantively change the description. This comment does not present the kind of new and significant information that would warrant a change in the final SEIS.

The following comment indicates that language in the draft SEIS or biological assessment concerning shortnose sturgeon and CORMIX modeling of Indian Point's thermal plume should be changed.

40-mm-AE; 40-jjj-AE; 40-ssss-AE

***Response**: These comments refer to a review of historical studies in Section 4.1.4.3, Thermal Studies and Conclusions, and suggest a re-analysis of historical study results. The purpose of this section is to present a historical perspective and not to reanalyze the original authors' work. These comments do not present the kind of new and significant information that would warrant a change in the final SEIS.*

The following comment indicates that draft SEIS language at page 4-25 regarding application of CORMIX modeling to the thermal plume should be changed. This would change the conclusion on level of impact for thermal impacts from "small to moderate" to "small."

40-e-AE; 40-y-AE; 40-nn-AE; 40-eeee-AE; 40-ffff-AE; 40-tttt-AE; 40-uuuu-AE; 40-bbbbbb-AE

***Response:** In its comments on the DSEIS, New York State DEC, the agency that permits thermal effluents in New York, stated that insufficient information is presently available to limit the range of thermal impact levels to small to moderate and concluded that a large level of impact could not be excluded. The NRC staff agrees that large impacts cannot be excluded and has modified its conclusions in Section 4.1.4.3, Thermal Studies and Conclusions to account for a range of small to large impact levels. The staff notes that the inclusion of a reference to New York State's thermal study requirement, which Entergy indicates applies to other power plants as well as Indian Point, was not intended to indicate that the Indian Point facility is not in compliance with the conditions of its SPDES permit.*

The following comment indicates that, because shortnose sturgeon, which is listed under the Endangered Species Preservation Act, has a slow maturation process and females do not spawn every year, any impacts to the population will be noticeable.

140-m-TS

***Response:** In general, NRC staff agrees that long time periods are required to detect population-level impacts to long-lived and slowly-maturing species. The staff believes it based its analysis on the best data available at this time.*

The following comment indicates that the NRC staff should use the best available scientific and commercial data to assess impacts to the endangered shortnose sturgeon. Data to assess impacts are in fact limited. The conclusion of Small to Large for shortnose sturgeon is not adequate. The staff needs to estimate the effects of impingement.

140-n-TS; 128-p-TS; 140-q-TS

***Response:** The NRC staff found inconsistencies in the shortnose sturgeon impingement data submitted to it by Entergy prior to publishing the draft SEIS. As a result, NRC staff requested*

that Entergy provide improved data (lacking the errors in earlier Entergy data) to NRC. Those data, which are the best available and more closely match the NMFS data, are included in Section 4, Appendices H and I, and a revised biological assessment.

The following comment indicates that the NRC staff had conflicting data from Entergy and NMFS on impingement of the endangered shortnose sturgeon.

40-qq-AE/ED; 140-o-TS

Response: *NRC found inconsistencies in the shortnose sturgeon impingement data sent to it by Entergy. Those data appear in the draft SEIS exactly as NRC received them from Entergy. As a result, NRC requested that Entergy send improved data (lacking the errors in earlier Entergy data) to NRC. Those data, which more closely match the NMFS data, are included in the final SEIS as the best available data.*

The following comment indicates that NRC simply noted that it had insufficient data to assess the effects of Indian Point operation on the endangered shortnose sturgeon instead of gathering data support a decision.

140-q-TS

Response: *New York State DEC, not NRC, is responsible for impingement and entrainment sampling as part of SPDES permitting. The NYSDEC may require additional entrainment and impingement monitoring, should it deem such sampling necessary. In addition, NMFS, not NRC, can require monitoring of endangered species under Section 7 of the Endangered Species Act if it finds such monitoring necessary.*

The following comment indicates that Indian Point Units 2 and 3 require an incidental take statement to comply with the Endangered Species Act.

140-r-TS

Response: *As summarized by the NRC staff in its biological assessment for shortnose sturgeon, the latest biological opinion for IP2 and IP3, conducted in 1979 by NMFS, did not require an incidental take statement. NMFS retains the authority to impose additional conditions as a result of ongoing consultation should it deem them necessary.*

The following comment indicates that NRC lacks the data to provide sufficient support for conclusions regarding the Atlantic sturgeon, which is a candidate species for listing under the Endangered Species Act, and other species.

128-p-TS; 140-t-TS

Response: *NRC found inconsistencies in the sturgeon impingement data it received from Entergy prior to the publication of the draft SEIS. After the NRC published the draft SEIS, Entergy submitted updated data to the NRC, and those data, which are the best available and more closely match the NMFS data, are included in Chapter 4, as well as Appendices H and I.*

The following comments indicate that the SEIS should contain summaries of life cycles of shortnose and Atlantic sturgeon in the Hudson River, as well as detailed explanations of impingement sampling of shortnose and Atlantic sturgeon at Indian Point from 1975 through 1990.

40-mmmmm-AE, 40-yyyy-AE

Response: *The SEIS and biological assessment contain this information.*

The following comments indicate that the correct number of sturgeon impinged from 1981 through 1990 equals the number counted in sampling each year as presented in the 1999 DEIS.

40-gg-AE; 40-nnnnn-TS, 40-ooooo-TS, 40-yyyy-AE

Response: *The NRC staff in the draft SEIS presented sturgeon impingement data exactly as Entergy provided them in response to the staff's requests. After NRC published the draft SEIS, Entergy supplied NRC revised data, which NRC presents in the final SEIS.*

The following comments express concern with the data on shortnose sturgeon impingement and indicate that it appears odd that nearly all impingement of shortnose sturgeon occurred in two years. There are several years that have no reported data at all. The data are self-conflicting and do not present a complete, accurate, and current illustration of the status of impinged sturgeon.

40-nnnnnn-TS;
140-n-TS; 140-o-TS; 140-p-TS; 140-q-TS

Response: *The NRC staff found inconsistencies in the shortnose sturgeon impingement data that was submitted by Entergy. After NRC published the draft SEIS, NRC staff requested improved data from Entergy. Those data, which are the best available and more closely match the NMFS data, are included in the final SEIS Chapter 4, Appendices H and I, and the revised biological assessment.*

The following comments indicate that the biological assessment for the endangered shortnose sturgeon is incomplete and therefore the draft SEIS is incomplete.

128-o-TS, 128-p-TS

Response: *The biological assessment submitted to NMFS with the draft SEIS reflected the best available data at that time. A revised biological assessment is being sent to NMFS along with the NRC's final SEIS. Consultation under the Endangered Species Act may continue.*

The following comment indicates that the essential fish habitat assessment is incomplete and therefore the DSEIS is incomplete.

128-q-AE

Response: *The essential fish habitat assessment has been completed and sent to NMFS.*

The following comments indicate that the NRC staff ignored New York State's findings on aquatic impacts, that the NRC should defer to the responsible permitting authority, and that the NRC's assessment is a direct contradiction to the State's assessment.

128-e-AE; 128-f-AE; 132-f-AE; 140–h-AE; 140-i-AE; 140-j-AE

Response: *The NRC staff assesses environmental impact levels in relation to NEPA and the NRC's regulations, which may have different purposes and requirements than New York State's regulations. The assessments and conclusions made by NRC staff in fulfilling the requirements of NRC and NEPA regulations do not supersede any regulatory decisions made by the State of New York.*

The following comment indicates that the NRC staff's assessment of a large impact on Hudson river bluefish is contrary to observations that very few adult bluefish are impinged, few if any bluefish eggs and larvae have ever been entrained, and survival of adult bluefish of the intake screens in likely very high.

40-c-AE; 40-hh-AE; 128-h-AE/AL

Response: *Based on comments on the draft SEIS and new and revised information provided by Entergy, the NRC Staff developed an alternative approach to assessing strength-of-connection. Information of this alternative analysis is found in Appendix H, Section H.1.3, Combined Effects of Impingement and Entrainment, and in Chapter 4*. The NRC staff revised the levels of impact for bluefish and other Hudson River species in the final SEIS based on the revised methodology.

The following comment indicates that NYSDEC believes that the impact level from continued operation of Indian Point's cooling water system should be large for striped bass, white perch, and Atlantic tomcod based on population trends, likelihood of impinging young-of-the-year, likelihood of reducing a food resource, and historical impingement and entrainment data collected at IP2 and IP3.

128-h-AE/AL

Response: *NRC staff assesses environmental impact levels in relation to NRC's regulations, which may have different requirements than New York State's regulations. The aquatic resources impact assessment in the final SEIS uses the best available data and a weight of evidence approach that encompasses two lines of evidence, each made up of several measures. The NRC staff's assessment and conclusions do not supersede the State of New York's authority to implement and enforce standards under the Clean Water Act.*

The following comment indicates that impacts to fish populations should cause the NRC staff to propose closed cycle cooling at Indian Point.

128-h-AE/AL

Response: *New York State DEC is responsible for insuring that intake and discharge structures comply with requirements of the Clean Water Act. New York State has indicated that closed-cycle cooling would be preferable, but has not required that Indian Point convert to closed-cycle cooling.*

The following comment indicates that New York State has been collecting and analyzing data for decades, and the NRC staff's recent analysis of aquatic impacts cannot supplant NYSDEC's analysis.

128-g-AE

Response: *The NRC staff assesses environmental impacts in relation to NEPA and NRC's regulations, which may have different purposes and requirements than New York State's regulations. The NRC staff's analysis does not supplant NYSDEC's analysis.*

The following comments assert that the SEIS does not assess the effects of radionuclides released from IP2 and IP3 in groundwater and food web accumulation on aquatic biota, including the shortnose sturgeon:

140-s-TS; 140-z-AE/CI

Response: *As part of NRC's operating reactor oversight program, the NRC staff performed independent sampling and analysis of environmental media related to the leaks of radioactive water from the spent fuel pools 2008. The NRC conducted an independent analysis of groundwater, Hudson River water, and fish during its inspection of IPEC's actions in response to the leaks. The following two key findings related to human health are also presented in the Chapter 2 of the SEIS. The first specifically addresses radiation levels identified in fish sampling, and the second addresses human exposures through fish consumption.*

1) "Currently, there is no drinking water exposure pathway to humans that is affected by the contaminated groundwater conditions at Indian Point Energy Center. Potable water sources in the area of concern are not presently derived from groundwater sources or the Hudson River, a fact confirmed by the New York State Department of Health. The principal exposure pathway to humans is from the assumed consumption of aquatic foods (i.e., fish or invertebrates) taken from the Hudson River in the vicinity of Indian Point, that has the potential to be affected by radiological effluent releases. Notwithstanding, no radioactivity distinguishable from background was detected during the most recent sampling and analysis of fish and crabs taken from the affected portion of the Hudson River and designated control locations."

2) "The annual calculated exposure to the maximum exposed hypothetical individual, based on application of Regulatory Guide 1.109, "Calculation of Annual Doses to Man from Routine Release of Reactor Effluents for the Purpose of Evaluation Compliance with 10 CFR Part 50, Appendix I," relative to the liquid effluent aquatic food exposure pathway is currently, and expected to remain, less than 0.1% of the NRC's "As Low As is Reasonably Achievable (ALARA)" guidelines of Appendix I of Part 50 (3 mrem/yr total body and 10 mrem/yr maximum organ), which is considered to be negligible with respect to public health and safety, and the environment."

The complete discussion of NRC actions and its inspection are contained in the NRC inspection report dated May 13, 2008. The full report is available to the public through the ADAMS electronic reading room on the NRC's website (www.NRC.gov). The ADAMS accession number for the inspection report is ML081340425.

In addition to the 2008 inspection report, IP2 and IP3 conduct a radiological environmental monitoring program (REMP) in which radiological impacts to the environment and the public are monitored, documented, and compared to NRC standards. Entergy summarizes the results of its REMP in an Annual Radiological Environmental Operating Report, and NRC reviews these reports. The reports are publicly available on the NRC's public website. The IP2 and IP3 REMP enables the identification and quantification of changes in the radioactivity of the area and to measure radionuclide concentrations in the environment attributable to operations at the IP2 and IP3 site.

The REMP samples environmental media in the environs around the site to analyze and measure the radioactivity levels that may be present. Within the REMP, the waterborne pathway consists of measurements of Hudson River surface water, fish and invertebrates, aquatic vegetation, bottom sediment, and shoreline soil.

While neither the 2008 inspection report process nor the REMP specifically sampled the shortnose sturgeon – an endangered and thus protected species – the inspection report

examined – and the REMP continues to examine – radionuclide levels in other fish and aquatic species.

The comment does not present any significant new information and no change has been made to the final SEIS.

The following comment indicates that the NRC staff did not include data or assess impacts associated with operation of Indian Point Unit 1.

140-q-TS

Response: *Indian Point Unit 1 (IP1) no longer operates and is in a condition known as SAFSTOR. The subject of this SEIS is Entergy's application to renew the operating licenses of IP2 and IP3 for an additional 20 years of operation beyond the term of the original licenses. IP1 operated from September 1962 through October 1974, and so affected the Hudson River aquatic resources before the start of the long-term ecological sampling programs used to assess environmental impacts in this SEIS.*

The following comment indicates that some aspects of the methodology used by the NRC staff for assessing impact to aquatic resources were unclear in the draft SEIS and were clarified only during a conference call with NRC staff and consultants.

40-ppppp-AE

Response: *In the draft SEIS, the NRC staff presented methods, sources of data, assumptions, and conclusions in Appendices H and I, and summarized them in Chapter 4. Based on new information provided by Entergy in its comments and the comments of others on the DSEIS, the NRC Staff modified its approach for assessing the aquatic population trends and strength-of-connection lines of evidence. The revised methods are shown in Chapter 4 and Appendices H and I of this final SEIS.*

The following comments indicate that two types of errors could occur in the methodology used by NRC to classify aquatic impacts into small, moderate, and large: identifying a potential impact when none actually exists and failure to identify a potential impact when in fact it does exist. The DSEIS provides no discussion of these types of errors or the relative degree of protection the classification process provides against each type.

40-qqqqq-AE; 40-ccccc-AE

Response: *Based on new information provided by Entergy in its comments and on the comments of others on the draft SEIS, the NRC revised the Weight of Evidence approach in the final SEIS and taken the decision rule process used in the draft out of the probabilistic-testing scenario, which makes this question less relevant.*

The following comment indicates that the US Fish and Wildlife Service is unable to concur with the determination that continued operation of IP2 and IP3 are not likely to adversely affect Indiana bats as NRC staff has not provided information on how the project may indirectly affect Indiana bats and their forage area.

139-a-TS

Response: *The NRC staff has added information to Section 4.6.2, Terrestrial Threatened or Endangered Species.*

The following comments indicate that studies should be done to confirm whether endangered Indian bats or threatened bog turtles live on the site and what impacts continued operation of IP2 and IP3 would have on these protected species.

97-b-TS; 97-j-OE/TS; 149-e-TS

Response: *The applicant has stated that no expansion of existing facilities or disturbance of forest or other land on the site would occur during the renewal period. The NRC staff believes that the lack of planned changes suggests that no new impacts would occur. In addition, site area does not have suitable habitat for the bog turtle, and bog turtles have not been reported in the region of Westchester County near the IP2 and IP3 site. The NRC staff concluded that bog turtles were not likely to occur on the site. These conclusions are stated in Section 4.2.2 of the draft SEIS, and so NRC staff made no change to that text in the final SEIS.*

The following comments indicate disagreement with the criteria used by NRC to assess impacts to aquatic resources. The levels of impact "small," "moderate," and "large" are subjectively defined and lack metrics. Because these criteria are subjectively defined, it is difficult to objectively evaluate cumulative impacts for any alternative, and it is difficult to objectively evaluate dissimilar impact categories (e.g., air quality, terrestrial ecology) in order to compare alternatives.

40-mmm-AE; 139-c-AE; 139-f-AL/AR

Response: *These impact levels are currently part of the NRC's environmental regulations, promulgated through a public rulemaking process. In the rulemaking process, NRC staff solicited public and agency comments. The impact levels cannot be changed by NRC staff within this proceeding.*

The following comment indicates that the NRC staff's weight-of-evidence approach is insufficiently protective of fishery resources and underestimates the potential effect of Indian Point on these fish. Although population level impacts are an appropriate measure of ecological effects, populations are difficult to sample and population trends may be difficult to measure

139-d-AE

Response: *The NRC staff believes that fishery resources are adequately addressed because the RIS it examined include a broad range of physiologies, trophic links, body sizes, migratory behaviors, commercial values, recreational interests, ecological services, and other characteristics in order to best represent the aquatic resources of the Hudson River. In its draft and final SEIS, NRC staff conducted a thorough weight-of-evidence analysis of impact levels on the RIS in relation to definitions of impact in NRC regulations. The NRC regulations define impact in terms of resource stability, not just numbers affected. Based on new information provided by Entergy in its comments and on the comments of others on the draft SEIS, the NRC Staff modified both the population trend and strength-of-connection lines of evidence. Information concerning this alternative analysis can be found in Appendix H, Section H.1.3, Combined Effects of Impingement and Entrainment, and Chapter 4 of the Final SEIS.*

The following comment indicates that NRC staff used no pre-Indian Point data, which clouds data interpretation.

139-d-AE

Response: *NRC staff recognizes that comparing attributes of aquatic resources before and after operation of IP2 and IP3 could provide additional information, if such data were available. Intensive sampling of the Hudson River began only after operation of IP2 and IP3 began, however, no data for the period before the operation of IP2 and IP3 are available.*

The following comment indicates that the NRC staff concluded that adverse heat related impacts to aquatic species may be small to moderate because it did not find evidence that adverse effects were "clearly noticeable and sufficient to destabilize important attributes of an aquatic resource." DOI disagrees with this conclusion because it is based on an absence of data and is not supported by scientific evidence such as on-site studies to objectively assess plant-related thermal stress on aquatic organisms.

139-e-AE

Response: *New York State, under the Clean Water Act, sets and enforces limits for thermal discharge from IP2 and IP3. The facility currently holds a SPDES permit issued by the State of New York, and that permit is the subject of ongoing adjudicatory proceedings before the NYSDEC. The NRC staff lacks authority to require Entergy to sample for compliance with the State's SPDES permit requirements. The State sets SPDES permit requirements based in part on potential impacts to aquatic life. The NRC staff has expanded the range of possible thermal impact levels to include large, the conclusion reached by New York State and DOI in their comments. See final SEIS, Section 4.1.4.5, NRC Staff Assessment of Thermal Impacts.*

The following comment indicates that certain cold water fish species may be particularly vulnerable to temperature changes caused by thermal discharges from electrical plants like Indian Point. Atlantic tomcod and rainbow smelt are such species.

139-e-AE

Response: *This observation has been added to Section 4.1.4.5 NRC Staff Assessment of Thermal Impacts.*

The following comments object to the numbers of Hudson River fish of all life stages killed by entrainment and impingement due to operation of the once-through cooling water systems at IP2 and IP3.

3-a-AE/LE/LR; 11-b-AE; 12-b-AE; 13-b-AE; 18-c-AE; 20-c-AE/OE; 27-b-AE; 37-a-AE/OR; 40-ccc-AL/TE; 54-c-AE; 61-a-AE/AL/OR; 63-c-AE; 73-g-AE; 87-d-AE/AL; 91-b-AE; 96-l-AE/AL/RG; 97-i-AE/OL; 106-a-AE/LE/RW/SF; 122-c-AE, 123-b-AE, 126-b-AE, 132-c-AE, 141-c-AE/LE/RI, 145-e-AE/AL, 149-a-AE, 161-e-AE, 166-a-AE, 1667-a-AE; 176-b-AE; 182-b-AE/HH/RW/SF; 183-a-AE/RW/SF

Response: *The responsibility for regulating the location, design, construction and capacity of cooling water intake structures to minimize adverse environment impact at IP2 and IP3 lies with New York State and not the NRC. The NRC staff has assessed and disclosed the impacts of extending the operation of IP2 and IP3 for an additional 20 years beyond their present license terms in accordance with the National Environmental Policy Act (NEPA) and NRC's regulations. These comments do not present the kind of new and significant information that would warrant a change in the final SEIS.*

The following comment contends that the majority of fish killed by entrainment and impingement are in the egg stage, so that looking just at numbers killed is misleading.

120-e-AE

Response: *In its draft and final SEIS, NRC staff conducted a thorough weight-of-evidence analysis of impact levels in relation to definitions of impact in NRC regulations. NRC regulations define impact in terms of resource stability, not just numbers affected. This comment does not present the kind of new and significant information that would warrant a change in the final SEIS.*

The following comments object to environmental effects of thermal discharges into the Hudson River due to operation of the once-through cooling water systems at IP2 and IP3.

13-b-AE; 87-d-AE; 96-l-AE/AL/RG; 96-m-AE; 97-d-AE; 97-h-AE/AL; 182-b-AE/HH/RW/SF

Response: *The responsibility insuring that thermal discharges from IP2 and IP3 meet New York State water quality criteria for protection of aquatic life lies with New York State and not the NRC. The NRC staff has assessed and disclosed the impacts of extending the operation of IP2 and IP3 for an additional 20 years beyond their present license terms in accordance with the National Environmental Policy Act (NEPA) and NRC's regulations. These comments do not present the kind of new and significant information that would warrant a change in the final SEIS.*

The following comment contends that NRC addressed ecological impacts inadequately.

9-e-AE/AL

Response: *In its draft and final SEIS, the NRC staff conducted a thorough weight-of-evidence analysis of impact levels in relation to definitions of impact in NRC regulations. NRC regulations define impact in terms of resource stability. The NRC staff modified its analysis in response to comments on the draft SEIS. This comment does not present the kind of new and significant information that would warrant a change in the final SEIS.*

The following comments state that the data do not support a finding other than large for ecological impacts to aquatic resources in the Hudson River.

20-c-AE; 21-a-AE/OR/SF; 40-qqq-AE; 123-a-AE

Response: *Because NYSDEC has the regulatory authority for thermal discharges, has stated that the applicant has exceeded thermal limits in the past, and has concluded that thermal impacts could be large, the NRC staff concludes that thermal impacts could range from small to large for selected species and has revised the final SEIS to reflect this conclusion. The responsibility for requiring monitoring of entrainment and impingement at IP2 and IP3 lies with New York State and not the NRC. In describing the available data and in its analysis, NRC staff described the age of the data from each of these in-plant monitoring programs and acknowledged the shortcomings of relying on such old data. The weight of evidence approach employed by the NRC staff included two primary lines of evidence: assessment of aquatic population trends in the Hudson River and an evaluation of strength of connection (i.e., relationship of the aquatic resources to power plant operations). NRC staff used population trend data available from 1974 or 1975, depending on the sampling program, through 2005 in its assessment. It also used impingement and entrainment data available from 1975 through 1990 to determine the strength of connection. Although entrainment and impingement monitoring*

was not conducted at IP2 and IP3 after 1990, NRC staff believes that sufficient information is available to determine the strength of connection between plant operations and aquatic resources in the Hudson River These comments do not present the kind of new and significant information that would warrant a change in the final SEIS.

The following comments indicate that other environmental impacts on Hudson River aquatic resources are more detrimental than impacts due to Indian Point or that positive impacts from Indian Point outweigh negative ones, so that negative aquatic impacts from Indian Point are comparatively insignificant.

33-a-AE/GL/LE; 113-b-AE/AL/EJ; 166-g-AE/SO

Response: *In accordance with NEPA, the NRC staff assessed the environmental impacts of license renewal for IP2 and IP3. The effects of other environmental impacts on Hudson River aquatic resources are discussed under Cumulative Impacts in the final SEIS.*

The following comments concern effects of global climate change on impacts to aquatic resources or the effects of Indian Point on climate change:

97-d-AE; 102-a-AL/OE; 102-b-AE/GL/OE; 113-h-AE/GL; 180-d-AE/AL/GL;

Response: *The NRC Staff addressed the effects of climate change on impacts to aquatic resources as part of cumulative impact assessment in Section 4.8.1.*

The following comments indicate concern about eutrophication or lack of monitoring for it.

40-w-AE/ED; 93-d-AE/MP/RG; 97-c-AE/WA

Response: *Eutrophication is commonly associated with lakes and ponds, although it may occur in rivers, particularly slow-moving rivers such as the Hudson River. Elevated temperatures from thermal discharges can exacerbate eutrophication. The responsibility for insuring that thermal discharges from IP2 and IP3 meet New York State water quality criteria for protection of aquatic life lies with New York State and not the NRC. The NRC staff has assessed and disclosed the impacts of extending the operation of IP2 and IP3 for an additional 20 years beyond their present license terms in accordance with the National Environmental Policy Act (NEPA) and NRC's implementing regulations. These comments do not present the kind of new and significant information that would warrant a change in the final SEIS.*

The following comment concerns the sufficiency of thermal studies conducted in the vicinity of Indian Point to provide the data necessary to assess aquatic impact levels.

93-e-AE/RG

Response: *The responsibility insuring that thermal discharges from IP2 and IP3 meet New York State water quality criteria for protection of aquatic life lies with New York State and not the NRC. The NRC staff has assessed and disclosed the impacts of extending the operation of IP2 and IP3 for an additional 20 years beyond their present license terms in accordance with the National Environmental Policy Act (NEPA) and NRC's implementing regulations This comment does not present the kind of new and significant information that would warrant a change in the final SEIS.*

The following comments concern the impacts of Indian Point's cooling water system on or propagating through aquatic food webs or habitats.

93-f-AE; 97-c-AE/WA; 97-d-AE; 173-a-AE/EP/ST; 180-c-AE/OE

Response: *The NRC staff recognizes the importance of considering indirect effects through food webs and habitat change. The staff chose RIS that include a broad range of physiologies, trophic links, body sizes, migratory behaviors, commercial values, recreational interests, ecological services, and other characteristics in order to best represent the aquatic resources of the Hudson River. Some of these species have trophic interactions with other RIS. In addition, the analysis of cumulative impacts considers trophic interactions. These comments do not present the kind of new and significant information that would warrant a change in the final SEIS.*

The following comment contends that increased predation by the increasing striped bass population in the Hudson River caused the decreases in other fish populations.

120-f-AE

Response: *The effects of environmental stressors other than operation of IP2 and IP3, including the increased striped bass population, on Hudson River aquatic resources are discussed under Cumulative Impacts in Chapter 4.*

The following comment indicates that New York State and Entergy do not have unresolved, competing views of Indian Point's impacts on aquatic resources as summarized by the NRC staff in the draft SEIS.

40-ttt-AE

Response: *Comments received by NRC staff from New York State agencies and Entergy on the draft SEIS indicate that the State and Entergy appear to have different views of Indian Point's impacts on aquatic resources.*

The following comments indicate that Entergy's analysis of aquatic impacts is based on more recent and complete data than New York State's FEIS and that NRC should afford Entergy's analysis more weight in its analysis.

40-ttt-AE; 40-uuu-AE; 40-vvv-AE

Response: *The NRC staff conducted an independent impact analysis of aquatic impacts as required by NEPA. The NRC staff's analysis is based on the most recent data as supplied by Entergy to the NRC. These comments do not present the kind of new and significant information that would warrant a change in the final SEIS.*

The following comment indicates that the NRC should have classified the impact on blue crab as small rather than unknown due to lack of data.

40-qqqq-AE

Response: *Based on new information provided by Entergy in its comments and the comments of others on the draft SEIS, the NRC staff modified the approach to assessing population trends and strength-of-connection lines of evidence. In the final SEIS, the level of impact for blue crabs is small. Information regarding this alternative analysis is found in the final SEIS, Appendix H, Section H.1.3, Combined Effects of Impingement and Entrainment, and Chapter 4.*

The following comment indicates that NRC analysis should include a listing of assumptions and analytical decisions that contribute to uncertainty and the implications of alternative assumptions.

40-qqqq-AE

Response: *The final SEIS includes a discussion of the various sources of uncertainty in the analysis.*

The following comment indicates that the data set collected by the Hudson River utilities is one of the largest ever collected on estuarine biology. The NRC staff's conclusions are not fully reflective of the available and relative information and are therefore in error.

40-aaaaaa-AE

Response*: The NRC staff recognizes that the data set collected by the Hudson River utilities is one of the largest collected on estuarine biology—particularly fish species. For this reason NRC staff elected to use an ecological risk assessment weight-of-evidence approach that examined multiple lines of evidence for a large number of representative and important species potentially affected by operation of IP2 and IP3. NRC staff also examined direct and indirect effects and cumulative effects of license renewal. NRC staff believes that the resulting analysis is sufficiently thorough and far reaching to assess impacts based on these data.*

These comments express concern about the classification of impact on bluefish as large.

40-b-AE; 40-c-AE; 40-aaaaaa-AE

Response*: As a result of updated and additional data submitted to NRC by Entergy after publication of the draft SEIS and modifications to methodology in response to technical comments on the draft SEIS, the impact of operation of IP2 and IP3 on bluefish has been revised in the final SEIS.*

The following comments indicate concern about killing shortnose and Atlantic sturgeon by entrainment and impingement due to operation of the once-through cooling water systems or concern about the lack of monitoring to determine the actual numbers of sturgeon entrained or impinged.

11-b-AE; 11-c-AE; 12-b-AE; 12-c-AE; 13-b-AE; 20-c-AE/OR; 27-c-AE; 37-a-AE/OR; 41-c-AE/LE; 44-c-AE/LE; 61-a-AE/AL/OR; 63-c-AE; 86-d-AE/AL/GL; 87-d-AE; 91-c-AE; 93-d-AE/MP/RG; 93-e-AE/RG; 93-f-AE; 97-d-AE; 97-i-AE/OL; 106-a-AE/LE/RW/SF; 126-b-AE; 141-c-AE/LE/RI; 161-e-AE; 167-a-AE; 176-c-AE; 182-b-AE/HH/RW/SF

Response: *New York State DEC, not NRC, is responsible for impingement and entrainment sampling as part of SPDES permitting. In addition, NMFS, not NRC, can require monitoring of endangered species under Section 7 of the Endangered Species Act. In the draft SEIS, the NRC staff presented sturgeon impingement data exactly as Entergy provided them. After the draft SEIS was published, Entergy submitted revised data, which the staff presents in the final SEIS and in a revised biological assessment prepared under the Endangered Species Act.*

The following comments indicate concern about assigning a small to large impact to shortnose sturgeon when the population appears to be increasing.

94-b-AE/OE; 40-ii-AE/AL/OE//TS

Response: *In the draft SEIS, the NRC staff presented sturgeon impingement data exactly as Entergy provided them. After the draft SEIS was published, Entergy submitted revised data, which the staff presents in the final SEIS, Chapter 4 and Appendices H and I and in a revised biological assessment prepared under the Endangered Species Act. Based on the revised data and methods, the NRC staff determined that the level of impact for shortnose sturgeon is small.*

The following comments indicate concern with one of several issues related to the shortnose sturgeon: (1) the problems of assessing impact or threats to endangered species when monitoring programs had been discontinued or never initiated and data sets are therefore incomplete, (2) the NRC staff's lack of definite conclusions on impacts from incomplete data, or (3) how the NRC staff expressed the uncertainties associated with impact levels for which underlying data were incomplete.

20-c-AE; 40-nnn-AE; 96-k-AE/TS; 97-d-AE; 97-i-AE; 140-a-AE

Response: *New York State DEC, not NRC, is responsible for impingement and entrainment sampling as part of SPDES permitting. NMFS, not NRC, can require monitoring of endangered species under Section 7 of the Endangered Species Act. In the draft SEIS, the NRC staff presented sturgeon impingement data exactly as Entergy had provided them. After the draft SEIS was published, Entergy submitted revised data, which the staff presents in the final SEIS and in a revised biological assessment prepared under the Endangered Species Act.*

The following comments indicate that NMFS, in 1979, concluded that the effect of entrainment and impingement of shortnose sturgeon by Indian Point would have a negligible effect on the population. Subsequently, IP installed devices to reduce impingement mortality. The Hudson River population of shortnose sturgeon appears to be growing. The observations indicate that impingement and entrainment are not adversely affecting the Hudson River population of shortnose sturgeon.

40-jj-AE; 40-bbbb-TS; 40-cccc-TS; 40-qqqq-AE

Response: *The NRC staff discusses the historical mitigation efforts at IP2 and IP3 and uses the best available data in its assessment. In the draft SEIS, the NRC staff presented sturgeon impingement data exactly as Entergy had provided them. After the draft SEIS was published, Entergy submitted revised data, which the staff presents in the final SEIS, Chapter 4 and Appendices H and I and in a revised biological assessment prepared under the Endangered Species Act. Based on the revised data and comments it received, the staff has revised the level of impact for shortnose sturgeon to small.*

The following comment indicates that NRC included among protected species the Atlantic sturgeon, which is a candidate for listing under the Endangered Species Act, and bald eagle, which was recently delisted.

40-aaaa-TS

Response: *The NRC staff has changed the pertinent section headings to 4.6.1, Aquatic Special Status Species, and 4.6.2, Terrestrial Special Status Species.*

The following comments are general statements that the NRC staff has not provided a thorough and accurate analysis of all relevant potential impacts.

17-r-EP/GI/RI; 40-zzzzzz-AE; 132-a-AL/OE; 132-e-GI/LR; 132-g-GI/LR; 164-i-GL; 174-f-GI/OM; 180-C-AE/OE; 180-h-GI/OM

Response: *The Generic Environmental Impact statement for license renewal (GEIS) evaluated 92 environmental issues and, of these, 69 were found to be generic (Category 1) while 23 issues were found to require a site-specific review and analysis. Twenty-one of the site specific issues are considered to be Category 2 issues. The remaining two issues, environmental justice and chronic effects of electromagnetic fields, were not categorized and are addressed by site-specific analysis.*

Category 1 issues are termed "generic" issues because the conclusions related to their environmental impacts were found to be common to all plants. For Category 1 issues, a single level of significance was common to all plants, mitigation was considered, and the NRC determined that it was not likely to be beneficial. Issues that were resolved generically are not reevaluated in the site-specific supplement to the generic environmental impact statement on license renewal (SEIS) because the conclusions reached would be the same as in the GEIS, unless new and significant information was identified that would lead the NRC staff to reevaluate the GEIS's conclusions.

Site-specific issues (Category 2 issues) were analyzed by the applicant as part of its environmental report. The NRC staff evaluated site-specific data provided by the applicant, other Federal agencies, state agencies, Tribal and local governments, as well as information from the open literature and members of the public. From this information, the staff made a site-specific assessment of the particular issues. Its analyses and conclusions are included in the SEIS.

The following comment states that the NRC level of impact to American shad from operation of IP2 and IP3 should be small and that the NRC staff's analysis should include qualitative estimates of conditional entrainment and impingement mortality rates (CEMR and CIMR) from CHGEC (1999).

40-q-AE/OE

Response: *Based on new information provided by Entergy and others in their comments on the DSEIS, the NRC Staff developed an alternative approach that uses impingement and entrainment data to provide ancillary information concerning the strength of connection. This assessment approach incorporates elements of CEMR and CIMR.*

The following comment states because the draft SEIS does not describe the basis of the health advisory for eating flesh of white catfish from the Hudson River, the final SEIS should say that "there is no relation between the health advisory and Indian Point."

40-r-AE/OE

Response: The *NRC staff reported the health advisory and did not state or imply any relation between the health advisory and the operation of IP2 and IP3. No change has been made to the SEIS.*

The following comment states that the FSEIS should cite Bath and O'Connor's (1985, New York Fish and Game Journal) paper on food selection of Hudson River white perch and say that "no evidence has been found that white perch consume other fish."

40-s-AE/OE

Response: *The U.S. Fish and Wildlife Services (Stanley and Danie 1983) finds that after white perch are 22 cm (9 inches) long, they eat fish almost exclusively. No change.*

Literature Cited in Response

Stanley, J.G., and D.S. Danie. 1983. Species profiles: life histories and environmental requirements of coastal fishes and invertebrates (North Atlantic -- white perch). U.S. Fish and Wild1ife Service, Division of Biological Services, FWS/OBS-82/11.7. U.S. Army Corps of Engineers, TR EL-82-4. 12 pp.

The following comment indicates the commenter's view that the NRC staff did not consider the magnitude of population effects in its analyses.

40-gg-AE

Response: The *NRC staff did consider the magnitude of population effects in its analyses. Further, based on new information provided by Entergy and others in their comments on the draft SEIS, the NRC staff revised the analysis of combined effects of entrainment and impingement to look more quantitatively at population effects.*

The following comments assert that the impact of IP2 and IP3 on the entire coastal stock of Atlantic menhaden from Florida to Maine should be small. Likewise, where the NRC staff found available site-specific data inadequate to draw firm conclusions on levels of impact, the NRC staff could use other (unspecified) sources of data or reasoning.

40-jj-AE, 40-kk-AE/ED

Response: The *NRC staff defined the two areas of interest for assessing impacts of IP2 and IP3: The lower Hudson River and the Hudson River Segment 4 near Indian Point. Based on new information provided by Entergy and others in their comments on the draft SEIS, the NRC staff revised its analysis of combined effects of entrainment and impingement and found an overall impact level of moderate for aquatic resources.*

The following comments express the opinion that Entergy has had a long-standing commitment to assess the health of the Hudson River and that the Hudson River is healthy with IP2 and IP3 operating.

40-yyyyy-AE, 120-k-AE

Response: The *NRC staff has independently assessed levels of impact to the Hudson River due to operation of IP2 and IP3 as part of the license renewal application process according to its own regulations in 10 CFR Part 51. The staff presents its conclusions in the final SEIS in terms of NRC-defined levels of impact (small, moderate, or large) rather than terms of "health of the Hudson River."*

The following comment indicates that the NRC's impact levels on aquatic life do not provide a meaningful indication of the actual impacts to aquatic life.

123-c-AE/OE

Response: The *NRC staff conducted a detailed, independent assessment of impacts of the operation of IP2 and IP3 on aquatic resources of the Hudson River. For a few species, the draft SEIS found that the available data were insufficient to support a firm conclusion in terms of the NRC's definitions of levels of impact and expressed the uncertainty due to insufficient data by providing a range of impact levels. In Section 4.1.3.5 of the draft SEIS, the NRC staff used the maximum and minimum over all species examined to represent the overall impingement and entrainment impact level, which was a range from small to large. Based on new information provided by Entergy and others in their comments on the draft SEIS, the NRC Staff modified the analysis in the final SEIS and represented impact levels more precisely. In Section 4.1.3.5 of the final SEIS, the staff expressed the weight-of-evidence scores numerically and used an average score over all species examined to represent the overall impingement and entrainment impact level, which the staff found to be "moderate."*

The following comment indicates that both the range of zebra mussels in the Hudson River and the NRC staff's trend analyses used in the DSEIS to assess potential effects of zebra mussels were limited to freshwater (River Segment 12), and so the conclusions should apply only to River Section 12 and not to the Indian Point segment of the River.

40-tt-AE; 40-ooo-AD/ED/OE

Response: *In assessing the impact of entrainment and impingement from IP2 and IP3, Entergy's consultants (Barnthouse et al. 2008, page 23), examined "…expected effects of CWIS [Cooling Water Intake Structure] and four other stressors that are widely regarded as potentially having affected Hudson River fish populations: fishing, invasion of the Hudson River by zebra mussels (*Dresseina polymorpha*), temperature (Atlantic tomcod only), and predation by striped bass." Previously, Strayer et al. (2004) had indicated that the invasion of zebra mussels may have affected fish populations, including number of adult American shad and striped bass as well as other species, by acting through the food web. The NRC staff therefore included zebra mussels when it independently assessed cumulative impacts to Hudson River aquatic resources due to operation of IP2 and IP3 and other stressors.*

Literature Cited in Response

Barnthouse, L.W., D.G. Heimbuch, W. van Winkle, and J. Young. 2008. Entrainment and Impingement at IP2 and IP3: A Biological Impact Assessment. Prepared for Entergy Nuclear Operations, Inc. January 2008. ADAMS Accession No. ML080390059.

*Strayer, D.L., K.A. Hattala, and A.W. Kahnle. 2004. Effects of an invasive bivalve (*Dreissena polymorpha*) on fish in the Hudson River estuary. Canadian Journal of Fisheries and Aquatic Sciences 61:924-941*

This comment indicates that although NRC staff could not develop an index of abundance for shortnose sturgeon, Woodland and Secor (2005) developed "a reliable index of abundance based on the Fall Juvenile Fish Survey."

40-nnn-AE.

Response: *NRC staff selected young-of-the-year fish from the Fall Shoals Survey (FSS) for developing its index of shortnose sturgeon abundance so that each index value is a measure of*

the single year class of young-of-the-year fish. Because each index of abundance represented a distinct year class, NRC staff could assess trends in abundance of YOY fish not only for shortnose sturgeon, but for all Hudson River RIS. Woodland and Secor (2005) used the largest size class in the FSS, which the utilities' data sets designate as LC4 and which would include fish from previous year classes, in their index of abundance. For the purposes assessing population trends in its analysis of RIS, NRC staff's index of abundance of YOY fish is the appropriate approach. Because the density of shortnose sturgeon is low, however, in some years the FSS captured no YOY and the index value is zero.

The following comments request revisions to the text on page 2-50 to indicate that no additional mortality studies were performed following installation of Ristroph screens at IP2 and IP3 because NYSDEC did not require additional studies:

40-o-ED/RG

Response: Text has been changed to reflect the comment.

The following comments assert that the NYSDEC SPDES permits contain reasonable measures to quantify and minimize impacts to the Hudson River:

55-b-AE/RG; 93-d-AE/MP/RG; 66-c-RG;113-k-AL/AQ/RG; 112-h-AL/RG; 96-l-AE/AL/RG; 93-e-AE/RG

Response: Under the authority created by the Clean Water Act Amendments of 1972, granted to the U.S. Environmental Protection Agency (EPA), and then delegated to the New York State Department of Environmental Conservation (NYSDEC), the State of New York is responsible for matters related to compliance with Clean Water Act provisions and under them, the provisions of the State Pollution Discharge Elimination System (SPDES) permits that are currently subject to adjudication before NYSDEC. NRC staff has no jurisdiction over SPDES standards, requirements, or challenges.

One commenter in this section indicated that NRC staff ought should collect additional data related to impingement, entrainment, and thermal shock. In conducting its analysis for this SEIS, the NRC staff has relied on the best available information on impacts from IP2 and IP3.

A.2.6 Comments Concerning Human Health Issues

The following comments primarily concern the human health impacts related to the operation of the Indian Point Energy Center (IPEC). The comments assert that the use of inadequate dose calculation methodology, the inappropriate use of "reference man" with its outdated physical assumptions, underestimates the risks to women and children, and in particular, that the dSEIS does not contain adequate evidence that the radioactive emissions from IPEC are within Federal limits. The comments also assert that the radioactive emissions from IPEC are responsible for increased cancer rates in the region. To support their position, the commenter's cite a report authored by Mr. Mangano (included in the transcript) which claims that the increased incidence of leukemia rates in the area around the plant site are the result of the radioactive emissions from IPEC. Finally, the commenters recommend that the NRC's public dose limit should be reduced from an annual dose of 100 mrem (1 mSv) to 25 mrem (0.25 mSv):

2-b-HH/RI; 2-c-HH; 22-a-HH/OR/OS/PA; 50-d-EP/HH; 50-o-HH/LE/PA; 73-a-HH; 73-e-EJ/HH; 79-a-HH; 79-s-EJ/HH; 87-b-HH/PA/RW/ST; 87-c-AM/HH/OM; 96-d-HH/LE/RI; 107-a HH/RA; 124-b-EJ/EP/HH/PA; 153-a-LE; 154-a-HH/LE/MP; 170-b-HH

Response: *The NRC's mission is to protect the public health and safety and the environment from the effects of radiation from nuclear reactors, materials, and waste facilities. The NRC's regulatory limits for radiological protection are set to protect workers and the public from the harmful health effects of radiation on humans. The limits are based on the recommendations of standards-setting organizations. Radiation standards reflect extensive scientific study by national and international organizations. The NRC actively participates and monitors the work of these organizations to keep current on the latest information concerning radiation protection. If the NRC determines that there is a need to revise its radiation protection regulations, it will initiate a rulemaking. The models recognized by the NRC for use by nuclear power reactors to calculate dose incorporate conservative assumptions and account for differences in gender and age to ensure that workers and members of the public are adequately protected from radiation.*

Although radiation may cause cancers at high doses , currently there are no reputable scientifically conclusive data that unequivocally establish the occurrence of cancer following exposure to low doses and dose rates, below about 10 rem (0.1 Sv). However, radiation protection experts conservatively assume that any amount of radiation may pose some risk of causing cancer or a severe hereditary effect and that the risk is higher for higher radiation exposures. Therefore, a linear, no-threshold dose response relationship is used to describe the relationship between radiation dose and detriments such as cancer induction. Simply stated, any increase in dose, no matter how small, results in an incremental increase in health risk. This theory is accepted by the NRC as a conservative model for estimating health risks from radiation exposure, recognizing that the model probably over-estimates those risks. Based on this theory, the NRC conservatively establishes limits for radioactive effluents and radiation exposures for workers and members of the public. While the public dose limit in 10 CFR Part 20 is 100 mrem (1 mSv) for all facilities licensed by the NRC, the NRC has imposed additional constraints on nuclear power reactors. Each nuclear power reactor, including IPEC, has enforceable license conditions that limit the total annual whole body dose to a member of the public outside the facility to 25 mrem (0.25 mSv). In addition, there are license conditions to limit the dose to a member of the public from radioactive material in gaseous effluents to an annual dose of 15 mrem (0.15 mSv) to any organ and for radioactive liquid effluents, a dose of 3 mrem (0.03 mSv) to the whole body and 10 mrem (0.1 mSv) to any organ. The NRC staff reviewed five years of radiation dose data from IP2 and IP3 and found the annual doses to members of the public to be well within the requirements discussed above.

The amount of radioactive material released from nuclear power facilities is monitored, and known to be very small. The doses of radiation that are received by members of the public as a result of exposure to nuclear power facilities are low (i.e., less than a few millirem) that resulting cancers attributed to the radiation have not been observed and would not be expected. To put this in perspective, each person in this country receives an average total annual dose of about 300 millirems (3 mSv) from natural sources of radiation (i.e., radon, 200 mrem; cosmic rays, 27 mrem; terrestrial [soil and rocks], 28 mrem; radiation within our body, 39 mrem) and about 63 mrem (0.63 mSv) from man-made sources (i.e., medical x-rays, 39 mrem; nuclear medicine, 14 mrem; consumer products, 10 mrem; occupational, 0.9 mrem; nuclear fuel cycle, <1 mrem; and fallout, <1 mrem).

Radiation from natural and man-made sources is not different in its properties or effect. Although a number of studies of cancer incidence in the vicinity of nuclear power facilities have

been conducted, there are no studies to date that are accepted by the scientific community that show a correlation between radiation dose from nuclear power facilities and cancer incidence in the general public. The information submitted by Mr. Mangano concerning the increase in child leukemia summarizes data published by the New York State Cancer Registry. While the data is a compilation of the cases and types of cancer recorded in New York State, it does not provide a basis for linking the cancer cases to the operation of IP2 and IP3 . The Mangano report asserts that the cancers are the result of radiation released from IPEC. The NRC staff reviewed the report cited by Mr. Mangano and found that it did not determine the cause for the cancer.

To ensure that U.S. nuclear power plants are operated safely, the NRC licenses the plants , licenses the plant operators, and establishes license conditions for the safe operation of each plant. The NRC provides continuous oversight of the plants through its Reactor Oversight Process (ROP) to verify that they are being operated in accordance with NRC regulations. The NRC has authority to take action to protect public health and safety and the environment, and may require immediate licensee actions, up to and including a plant shutdown.

The NRC has considered and addressed this issue in the SEIS. The comments do not present any significant new information that would warrant a change to the final SEIS.

The following comments assert that Indian Point provides clean electric power in a manner that is good for our air and water, lowers the rates of childhood asthma and other ailments, and fights global warming by reducing greenhouse gases:

8-c-AQ/HH/SO; 31-b-EC/EJ/HH; 42-c-HH; 85-b-AQ/HH; 99-b-AQ/HH

Response: *The comments are acknowledged. The comments do not present any significant new information that would warrant a change to the final SEIS.*

The following comments assert that the EIS does not adequately discuss the long term impacts from routine radioactive releases and radionuclides leaking from the spent fuel pool into the groundwater and drinking water, including the potential Rockland County desalination plant's use of Hudson River water, and the impacts from eating fish from the Hudson River:

20-b-HH; 27-d-LE; 51-a-HH/PA/UF; 69-a-HH/LE/OR/PA; 73-c-EJ/HH/LE; 79-e-HH/SO; 79-s-EJ/HH; 96-d-HH/LE/RI; 96-e-HH/LE/WA; 96-g-EJ/HH/LE; 97-a-EJ/HH; 97-k-EJ/HH/LE; 98-c-HH/LE/RI; 102-h-HH/RI; 135-b-LE; 137-j-RI; 140-v-GW/HH/RI; 140-w-GW/HH/RI; 140-x-HH; 140-y-AE/CI; 140-aa-SM; 145-c-HH/LE; 149-c-HH/LE; 153-a-LE; 153-b-LE; 164-c-LE; 164-g-LE/MP; 170-e-LE/WA; 172-a-HH/RI; 174-a-HH/RI; 176-d-LE; 178-a-LE/OR/RW; 179-e-LE/WA; 180-a-HH/LE/RI

Response: *The NRC staff does not agree with this comment. There is a thorough discussion in Chapters 2 and 4 that addresses impacts to human health from routine and abnormal radioactive releases. The NRC staff reviewed five years of historical radioactive and radiological environmental monitoring data. Based on the data, the Staff concluded that the calculated doses to a member of the public from the radioactive releases were within NRC's radiation dose standards. The environmental data showed some radionuclides associated with the operation of IP2 and IP3; however, residual radioactivity from atmospheric weapons tests and naturally occurring radioactivity were the predominant sources of radioactivity in the samples collected. The Staff concluded that IPEC operations did not result in an adverse impact to the public greater than environmental background levels.*

The NRC staff also evaluated the impacts from the leaking radioactive material into the groundwater and into the Hudson River in Chapters 2 and 4. The dSEIS used information from an Inspection conducted by personnel from NRC's Region I office and NRC's Headquarters office. The NRC thoroughly inspected this issue at IPEC, starting with initial notification of the leaks in September 2005 until the inspection closed in May 2008. The NRC Inspection Report (ADAMS Accession number ML081340425) reached the following conclusion: "Our inspection determined that public health and safety has not been, nor is likely to be, adversely affected, and the dose consequences to the public that can be attributed to current on-site conditions associated with groundwater contamination is negligible." In the text of the Inspection Report there are two key conclusions relevant to the potential human health impacts from the leaks. They are presented here and in Chapter 2 of the dSEIS:

1) "Currently, there is no drinking water exposure pathway to humans that is affected by the contaminated groundwater conditions at Indian Point Energy Center. Potable water sources in the area of concern are not presently derived from groundwater sources or the Hudson River, a fact confirmed by the New York State Department of Health. The principal exposure pathway to humans is from the assumed consumption of aquatic foods (i.e., fish or invertebrates) taken from the Hudson River in the vicinity of Indian Point, that has the potential to be affected by radiological effluent releases. Notwithstanding, no radioactivity distinguishable from background was detected during the most recent sampling and analysis of fish and crabs taken from the affected portion of the Hudson River and designated control locations."

2) "The annual calculated exposure to the maximum exposed hypothetical individual, based on application of Regulatory Guide 1.109, "Calculation of Annual Doses to Man from Routine Release of Reactor Effluents for the Purpose of Evaluation Compliance with 10 CFR Part 50, Appendix I," relative to the liquid effluent aquatic food exposure pathway is currently, and expected to remain, less than 0.1% of the NRC's "As Low As is Reasonably Achievable (ALARA)" guidelines of Appendix I of Part 50 (3 mrem/yr total body and 10 mrem/yr maximum organ), which is considered to be negligible with respect to public health and safety, and the environment."

To ensure that the nuclear power plants are operated safely and maintain radioactive emissions within regulatory limits, the NRC licenses the plants , licenses the plant operators, and establishes license conditions for the safe operation of each plant. The NRC provides continuous oversight of plants through its Reactor Oversight Process (ROP) to verify that they are being operated in accordance with NRC regulations. The NRC has authority to take actions as necessary to protect public health and safety, and may require immediate licensee actions, up to and including a plant shutdown.

Regarding the potential operation of a Rockland County desalination plant, the NRC staff addressed potential future cumulative radiological impacts in Chapter 4, section 4.8.3, "Cumulative Radiological Impacts." The NRC staff discussed the applicable radiation protection limits set by the NRC and the EPA to protect members of the public from the cumulative impacts of radiation. The NRC staff noted that the NRC and the State of New York would regulate any future actions in the vicinity of IP2 and IP3 that could contribute to cumulative radiological impacts. Therefore, if plans for the proposed Rockland County desalination plant advance to the licensing phase, the facility would be required to have the means to monitor the source water and, if necessary, have a treatment system to meet applicable drinking water standards for radioactive and nonradioactive contaminants.

The NRC has considered and addressed this issue in the SEIS. The comments do not present any significant new information that would warrant a change to the final SEIS.

The following comments indicate that Indian Point's radiological environmental monitoring program (REMP) does not collect milk samples. The Mother's Milk Project asserts that goat's milk was collected and was analyzed and found to contain Sr-89 and Sr-90, which it asserts is from radioactive emissions from IPEC. In addition, the comments cite a concern that the NRC, New York State, and Connecticut do not independently collect and analyze milk samples:

24-a-HH/OR/RI; 24-b-HH/OR/RI; 79-f-HH; 149-c-HH/LE; 153-a-LE; 154-a-HH/LE/MP; 172-a-HH/RI

Response: *It is correct that the IPEC's REMP does not collect and analyze milk samples. This is because the last nearby dairy farm closed in 1992. The closure of the dairy farm was also reported by the State of New York in its 1994 report (the last publicly available state report) on the results of their independent REMP conducted in the environs around IPEC.*

The NRC's guidance on environmental monitoring allows for the substitution of an alternate environmental medium if a particular environmental medium is unavailable. In this case, IPEC collects samples of broadleaf vegetation because there is no local dairy farm where it can obtain milk samples. The dSEIS, in Chapter 2, discussed IPEC's 2006 REMP data for Sr-90 as being attributable to past atmospheric weapons testing. The levels detected were consistent with the historical levels of radionuclides resulting from weapons testing as measured over the years. Additionally, the calculated maximum organ dose in 2006 to an offsite member of the public from gaseous iodine, tritium, and particulate effluents from IP1 and IP2 was 1.19 $x10^{-2}$ mrem (1.19$x10^{-4}$ mSv) to the child thyroid. For IP3, the calculated maximum organ dose in 2006 to an offsite member of the public from gaseous iodine, tritium, and particulate effluents for the maximally exposed organ (child liver) was 1.07$x10^{-3}$ mrem (1.07$x10^{-5}$ mSv). These doses are well within the NRC's dose design objective of 15 mrem (0.15 mSv) in Appendix I to 10 CFR Part 50. Thus, the NRC staff concluded in Chapter 4 of the dSEIS that the impacts to members of the public and the environment were bounded by the evaluations in the GEIS, which assessed the impacts as SMALL.

The NRC does not conduct an independent REMP around nuclear power plants. The NRC licenses the nuclear plants , licenses the plant operators, and establishes regulations and license conditions for the safe operation of each plant. The NRC provides continuous oversight of plants through its Reactor Oversight Process (ROP) to verify that the plants perform all required monitoring and are being operated in accordance with NRC rules and regulations. The NRC has authority to take action as necessary to protect public health and safety and may demand immediate licensee actions, up to and including a plant shutdown. At IPEC, the NRC staff performed independent sampling and analysis of environmental media related to the leaks of radioactive water from the spent fuel pools. The NRC conducted an independent analysis of groundwater, Hudson River water, and fish during its inspection of IPEC's actions in response to the leaks. In the text of the Inspection Report there are two key conclusions relevant to the potential human health impacts from the leaks. They are presented here and in the dSEIS:

1) "Currently, there is no drinking water exposure pathway to humans that is affected by the contaminated groundwater conditions at Indian Point Energy Center. Potable water sources in the area of concern are not presently derived from groundwater sources or the Hudson River, a fact confirmed by the New York State Department of Health. The principal exposure pathway to humans is from the assumed consumption of aquatic foods (i.e., fish or invertebrates) taken

from the Hudson River in the vicinity of Indian Point, that has the potential to be affected by radiological effluent releases. Notwithstanding, no radioactivity distinguishable from background was detected during the most recent sampling and analysis of fish and crabs taken from the affected portion of the Hudson River and designated control locations."

2) "The annual calculated exposure to the maximum exposed hypothetical individual, based on application of Regulatory Guide 1.109, "Calculation of Annual Doses to Man from Routine Release of Reactor Effluents for the Purpose of Evaluation Compliance with 10 CFR Part 50, Appendix I," relative to the liquid effluent aquatic food exposure pathway is currently, and expected to remain, less than 0.1% of the NRC's "As Low As is Reasonably Achievable (ALARA)" guidelines of Appendix I of Part 50 (3 mrem/yr total body and 10 mrem/yr maximum organ), which is considered to be negligible with respect to public health and safety, and the environment."

The complete discussion of NRC actions and its inspection are contained in the NRC inspection report dated May 13, 2008. The full report is available to the public through the ADAMS electronic reading room on the NRC's website (www.NRC.gov). The ADAMS accession number for the inspection report is ML081340425.

The NRC has no authority to require the States of New York or Connecticut to perform independent collection and analysis of environmental media around IPEC.

The NRC has considered and addressed this issue in the SEIS. The comments do not present any significant new information that would warrant a change to the final SEIS.

The following comments assert that the SEIS does not adequately discuss the information on samples of mother's milk (human and animal) that was tested and found to have detectable levels of radioactive Sr-89 and Sr-90:

24-a-HH/OR/RI; 50-o-HH/LE/PA

Response: *The NRC does not require the sampling and analysis of human mother's milk, nor does it have the authority to require such sampling. The issue of the sampling and analysis of animal milk and the radiation doses to members of the public and impact to the environment was discussed in the preceding comment response. Regarding the purported detection of radionuclides attributed to the operation of IPEC in milk samples collected and analyzed by the Mother's Milk Project, the NRC staff found that the report contained very limited radiological information, and lacked documentation on the authenticity, precision and accuracy of the data from a competent analytical laboratory.*

The NRC staff considered and addressed this issue in the draft SEIS. The comments do not present any significant new information that would warrant a change to the final SEIS.

The following comment asserts that the SEIS does not adequately address the air quality deterioration and negative human health effects that would result from the shutdown of Indian Point:

90-c-AL/AQ/HH

Response: *This comment was responded to in the Air Quality comment resolution section.*

The following comment asserts that the human health consequences of an accident need to be more thoroughly discussed in the SAMA section of the SEIS:

50-I-HH/PA; 17-p-EP/PA/RI

Response: *The severe accident mitigation alternatives (SAMA) review provides an evaluation of potential alternatives to mitigate the effects of severe accidents. Severe nuclear accidents are more severe than design basis accidents, and could result in substantial damage to the reactor core, regardless of offsite consequences. In the GEIS , the NRC assessed the impacts of severe accidents using the results of existing analyses and site-specific information to conservatively predict the environmental impacts of severe accidents for each plant during the renewal period. Based on information in the GEIS, the Commission found the following:*

"The probability weighted consequences of atmospheric releases, fallout onto open bodies of water, releases to groundwater, and societal and economic impacts from severe accidents are small for all plants. However, alternatives to mitigate severe accidents must be considered for all plants that have not considered such alternatives."

Therefore, the Commission has designated mitigation of severe accidents as a Category 2 issue in 10 CFR Part 51, Subpart A, Appendix B, Table B-1. Chapter 5 in the dSEIS contains the NRC staff's evaluation of IPEC's mitigation of severe accidents.

The NRC staff reviewed and evaluated SAMAs for IPEC to ensure that the range of changes (i.e., hardware modifications, changes to plant procedures, and changes to the training program) that could improve severe accident safety performance were identified and evaluated. While the SAMA evaluation contains population radiation dose information in Table 5-4 in chapter 5, the values are used to show the relative percent of the dose resulting from the various containment failure modes that were evaluated. The purpose of the SAMA is not to evaluate the human health impacts, but rather to evaluate a range of mitigation actions that may reduce the risk of a severe accident and are cost-effective.

The NRC has considered and addressed this issue in the SEIS and the comment does not present any significant new information that would warrant a change to the final SEIS.

The following comment asserts that the SEIS should evaluate the health consequences of a spent fuel fire:

89-a-HH/PA/SF

Response: *The environmental and health impacts of design basis accidents (DBAs) are evaluated during the initial licensing process, and the ability of the plant to withstand these accidents is demonstrated to be acceptable before issuance of an operating license. The results of these evaluations are contained in licensing documentation such as the applicant's final safety analysis report, the NRC staff's safety evaluation report, the final environmental statement (FES) and Section 5.1 of the draft SEIS.*

In the GEIS, the Commission determined that the environmental impacts of DBAs are of SMALL significance for all plants because the plants were designed to successfully withstand these accidents. As part of the license renewal process, the NRC staff has not identified any new and significant information during its independent review of the IP2 and IP3 environmental report, the site visit, the scoping process, or evaluation of other available information.

Therefore, the NRC staff concludes that there are no impacts related to DBAs beyond those discussed in the GEIS.

In addition, the issue of a spent fuel fire was specifically addressed by the NRC in two Petitions for Rulemaking (PRM) (PRM 51-10 and PRM 51-12) submitted by the Attorney General of the Commonwealth of Massachusetts and the Attorney General of the State of California. The details of the petitions and the NRC's evaluation are available to the public through the ADAMS electronic reading room on the NRC website (www.NRC.gov) and in the Federal e-Rulemaking Portal: Go to http://www.regulations.gov and search for documents filed under Docket ID [NRC–2006–0022] (PRM–51–10), and [NRC–2007–0019] (PRM–51–12).

The Massachusetts and California Petitioners requested that the NRC initiate a rulemaking concerning the environmental impacts of the high density storage of spent nuclear fuel in spent fuel pools (SFPs). The Petitioners asserted that ''new and significant information'' shows that the NRC incorrectly characterized the environmental impacts of high-density spent fuel storage as ''insignificant'' in its GEIS for the renewal of nuclear power plant licenses. Specifically, the Petitioners asserted that spent fuel stored in high-density SFPs is more vulnerable to a zirconium fire than the NRC concluded in its NEPA analysis.

The Commission denied the petition for rulemaking, concluding as follows:

"Based upon its review of the petitions, the NRC has determined that the studies upon which the Petitioners rely do not constitute new and significant information. The NRC has further determined that its findings related to the storage of spent nuclear fuel in pools, as set forth in NUREG–1437 and in Table B–1, of Appendix B to Subpart A of 10 CFR Part 51, remain valid. Thus, the NRC has met and continues to meet its obligations under NEPA. For the reasons discussed previously, the Commission denies PRM–51–10 and PRM–51–12."

The NRC has considered and addressed the issue raised in this comment in the SEIS. The comments do not present any significant new information that would warrant a change to the final SEIS.

The following comment asserts that the average level of Sr-90 in baby teeth in the Indian Point area is among the highest in the U.S and rose sharply after the 1980s:

107-a-HH/RI

Response: *The NRC staff does not agree with this comment. In 2000, a report entitled "Strontium-90 in Deciduous Teeth as a Factor in Early Childhood Cancer" was published by the Radiation and Public Health Project. The report alleges that there has been an increase in cancer incidence due to strontium-90 released from nuclear power facilities. Elevated levels of strontium-90 in deciduous (baby) teeth were claimed in the report as the evidence for the increase in childhood cancer.*

There are three sources of strontium-90 in the environment: fallout from nuclear weapons testing, releases from the Chernobyl accident in the Ukraine, and releases from nuclear power reactors. The largest source of strontium-90 is from weapons testing fallout as a result of above-ground explosions of nuclear weapons (approximately 16.9 million curies of strontium-90). The Chernobyl accident released 216,000 curies of strontium-90. The total annual release of strontium-90 into the atmosphere from all U.S. nuclear power plants is typically 1/1,000th of 1 curie, which is so low that the only chance of detecting strontium-90 is sampling the nuclear power plant effluents themselves. The NRC regulatory limits on radioactive effluent releases

and doses to the public are based on the radiation protection recommendations of international and national organizations such as the International Commission on Radiological Protection (ICRP) and the National Council on Radiation Protection and Measurements (NCRP). Gaseous effluent releases are monitored at IPEC, and the results of the monitoring are reported annually to the NRC and are publicly available on the NRC's website. The radiological effluent release program and the radiological environmental monitoring program at IPEC were reviewed by the NRC staff as part of the license renewal process and found to be acceptable.

Additionally, in a report published in 2001, the American Cancer Society concluded that although reports about cancer case clusters in communities surrounding nuclear power plants have raised public concern, studies show that clusters do not occur more often near nuclear plants than they do by chance elsewhere in the population. The NCRP has observed no statistically significant data which supports that there is an increased incidence of biological effects due to strontium-90 exposures at levels typical of worldwide fallout, which is the greatest source of strontium-90 in the environment. Likewise, there is no new evidence that links strontium-90 with increases in breast cancer, prostate cancer, or childhood cancer rates. The American Cancer Society recognizes that public concern about environmental cancer risks often focuses on risks for which no carcinogenicity has been proven or on situations where known exposures to carcinogens are at such low levels that risks are negligible. The report states that "ionizing radiation emissions from nuclear facilities are closely controlled and involve negligible levels of exposure for communities near such plants."

Radioactive releases of gaseous and liquid effluents, including releases from the IP2 spent fuel pool into the groundwater, are discussed in Chapter 2 of the SEIS and found to be within NRC dose limits.

The comment does not present any significant new information that would warrant a change to the final SEIS.

The following comment asserts that the radioactive emissions from Indian Point are among the highest in the U.S:

107-a-HH/RI; 172-a-HH/RI

Response: *All nuclear plants were licensed with the expectation that they would release some radioactive material to both the air and water during normal operation. NRC regulations require that radioactive gaseous and liquid releases from nuclear power plants meet radiation dose-based limits specified in 10 CFR Part 20, the "as low as is reasonably achievable" (ALARA) dose criteria in Appendix I to 10 CFR Part 50, and the EPA's regulations in 40 CFR Part 190. Regulatory limits are placed on the radiation dose that members of the public might receive from radioactive material released by nuclear plants. The NRC regulations are dose based, such that the dose resulting from the radioactive effluent is the value used by the NRC to determine compliance with regulatory limits. Nuclear power plants are required to report their radioactive gaseous, liquid, and solid effluent releases as well as the results of their radiological environmental monitoring program annually to the NRC. The annual effluent release and radiological environmental monitoring reports submitted to the NRC are available to the public through the ADAMS electronic reading room on the NRC website (www.NRC.gov).*

As part of the license renewal process, the NRC staff reviewed the radiological effluent release program and the radiological environmental monitoring program at IPEC and found them to be acceptable. The Staff's radiological evaluation of IPEC is in Chapter 2 and 4 of the dSEIS.

The NRC has considered and addressed this issue in the SEIS. The comments do not present any significant new information or arguments that would warrant a change to the final SEIS.

The following comments assert that a 2004 study by Columbia University on 54,000 nuclear power plant workers showed that they have fewer cancers and live longer than their counterparts in the general population.

120-b-HH; 120-h-OP/HH

Response: *The NRC staff is aware of the study. The comment does not does not present any significant new information that would warrant a change to the final SEIS.*

The following comment asserts that the EIS must include an evaluation of the impacts to poor people who rely on fishing for their diet who are being indirectly exposed to radiation from eating contaminated fish:

124-b-EJ/EP/HH/PA

Response: *The NRC staff performed a thorough evaluation of this issue in chapter 4 of the dSEIS. As indicated, the staff reviewed the results of IPEC's radiological environmental monitoring program (REMP), which show that concentrations of radioactive contaminants in native leafy vegetation, soils and sediments, Hudson River surface water and fish from the vicinity of IPEC are very low (at or near the threshold of the survey instrument's detection capability) and seldom above background levels. Based on these data, the NRC staff concluded that no disproportionately high and adverse human health impacts would be expected in special pathway receptor populations in the region as a result of subsistence consumption of fish and wildlife*

The NRC has considered and addressed this issue in the SEIS. The comment does not present any significant new information that would warrant a change to the final SEIS.

A.2.7 Comments Concerning Socioeconomic Issues

The following comments express concern about the reliability and cost of energy and electric power. Several comments stated that the continued operation of Indian Point is a key component to the region's economic stability because of its ability to provide jobs and reliable electricity at a low cost. Those comments stressed that, if Indian Point was to cease operation, the area would experience a rise in electricity costs and interrupted service (including blackouts) over the next twenty years. Several comments expressed concerns about potential air quality impacts from alternative energy fossil-fueled power plants if Indian Point were to be shut down. The comments also wanted to make known the benefits of Indian Point as an emissions-free electricity provider.

1-a-EC/SO/SR; 1-c-EC/SO; 8-b-SO; 8-c-AQ/HH/SO; 19-b-EC/SO/SR; 19-c-EC/SO/SR; 26-c-EC/SO/SR; 28-b-EC/SO; 42-b-EC/SO; 42-f-EC/SO; 48-b-EC/SO; 48-d-AQ/SO; 57-e-EC/OP/SO; 58-c-AQ/EC/SO; 78-c-SO/SR; 85-a-EC/SO/SR; 92-a-EC/SO/SR; 101-c-SO/SR; 108-a-EC/SO/SR; 115-b-SO; 119-b-EC/SO; 119-c-AQ/EC/SO; 119-e-EC/GI/SO; 119-g-EC/SO/SR; 133-a-EC/SO/SR; 146-d-EC/SO; 150-e-AQ/OP/SO; 157-b-AL/EC/SO; 157-f-AL/EC/SO; 166-b-AL/EC/SO; 177-a-AQ/EC/SO

Response: *Nuclear power plants, like various other electrical generating plants, generate a significant amount of employment and income in the local economies. The local communities provide the people, goods, and services needed to operate the power plant. Power plant*

operations, in turn, provide wages and benefits for people, and payments for goods and services.

Any impact on electricity costs and service impacts from the loss of IP2 and IP3 electrical generating capacity is speculative. Due to the deregulation of the energy market in the State of New York, competition for the sale of electricity may keep electricity costs and services under control.

These comments are generally supportive of license renewal for IP2 and IP3 and nuclear power. The NRC is responsible for licensing and regulating the operation of nuclear power plants to ensure the protection of public health and safety and the environment. Air quality impacts from alternative energy power generation including environmental justice concerns are discussed in Chapter 8 in the SEIS. These comments do not present any significant new information that would warrant a change to the final SEIS.

The following comments pertain to contributions to the local economy in the form of high-paying jobs and tax revenue:

7-c-SO; 23-b-SO; 23-f-EC/SO; 23-i-EC/SO/SR; 29-a-SO/SR; 36-d-OP/SO; 57-b-AQ/EC/SO; 65-a-SO/SR; 65-c-EC/SO/SR; 67-b-EC/SO; 90-f-EC/SO; 92-b-EC-SO; 92-d-SO/SR; 92-e-SO/SR; 92-g-SO/SR; 105-a-SO/SR; 109-a-SO; 115-a-SA/SE/SO; 116-a-SO/SR; 116-b-EC/SO; 119-i-SO; 130-a-AQ/SO; 130-b-OP/SO/SR; 137-o-SO; 144-b-EC/SO; 150-b-SA/SO; 155-a-EC/SO; 166-d-SO/SR; 166-e-SO/SR; 166-g-AE/SO; 169-a-AL/EC/SO

Response: *Nuclear power plants, like various other electrical generating plants, generate a significant amount of employment and income in the local economies. The local communities provide the people, goods, and services needed to operate the power plant. Power plant operations, in turn, provide wages and benefits for people, and payments for goods and services.*

Terminating nuclear plant operations and reducing plant staff would have an impact on regional employment and income, and may affect the quality and availability of community services. Income from plant wages and salaries as well as expenditures for goods and services would decrease. Indirect employment and income created as a result of nuclear power plant operations would also disappear or be reduced. Demand for services and housing would substantially decline as plant workers and their families leave the area in search of jobs elsewhere, creating a decline in demand for housing, depressing housing prices and values. Conversely, housing markets in the vicinity of metropolitan areas generally experience more rapid, housing turnover, higher prices, and lower vacancy rates. While the loss of plant employment in urban regions may mean some out-migration of workers, many plant employees would be able to find other opportunities for employment. In addition, the socioeconomic impact on small businesses could be offset by economic growth in other parts of the regional economy.

These comments are generally supportive of license renewal for IP2 and IP3. These comments do not present any significant new information that would warrant a change to the final SEIS.

The following comments pertain to Entergy's involvement in the local community:

43-a-SE/SO; 48-a-SE/SO; 57-c-SA/SE/SO; 67-e-SE/SO; 85-c-EC/SO/SR; 109-c-SE/SO; 111-a-SO; 111-b-SO/SR; 111-c-EC/SO; 111-d-SO; 136-a-CR/SO/SR; 136-b-SO/SR; 150-f-SO/SR; 163-a-SE/SO/SR

Response: *These comments are generally supportive of Entergy's involvement in the local community and for the license renewal of IP2 and IP3. These comments do not present any significant new information that would warrant a change to the final SEIS.*

The following comments indicate that the DSEIS inadequately addresses socioeconomic impacts:

4-d-CI/LR/SO; 79-g-SO

Response: *The environmental review considers the potential socioeconomic impacts of license renewal on the communities and people living in the region surrounding IP2 and IP3. The discussion of impacts in this SEIS focuses on environmental issues of license renewal in proportion to their significance.*

As discussed in Section 2.2.8 of the SEIS, the nuclear plant and the people and communities that support it can be described as a dynamic socioeconomic system. The local communities provide the people, goods, and services needed to operate the nuclear power plant. Power plant operations, in turn, provide wages and benefits for people, and payments for goods and services. The measure of a communities' ability to support IP2 and IP3 operations depends on the ability of the community to respond to changing environmental, social, economic, and demographic conditions.

The socioeconomics region of influence (ROI) is defined by the area where IP2 and IP3 employees and their families reside, spend their income, and use their benefits, thereby affecting the economic conditions of the region. The IP2 and IP3 ROI consists of Dutchess, Orange, Putnam, and Westchester Counties, where approximately 84 percent of IP2 and IP3 employees reside. Riverfront communities in these counties were included in the assessment of socioeconomic impacts. Since Entergy has no plans to add non-outage employees during the license renewal period, employment levels at IP2 and IP3 would not change. Based on this information, there would be no socioeconomic impacts in the ROI during the license renewal term beyond those already being experienced. Cumulative socioeconomic impacts of license renewal are discussed in SEIS Section 4.8.4.

In addition, the safe operation of nuclear power plants is not limited to license renewal but is and will be dealt with on a daily basis as a part of the current and renewed operating license. Safety issues and concerns are addressed by the NRC on an ongoing basis at every nuclear power plant. Safety inspections are and will be conducted throughout the operating life of the plant, whether during the original or renewed operating license. If safety issues are discovered at a nuclear power plant, they are addressed immediately, and any necessary changes are incorporated under the current operating license. As such, the regulatory safety oversight of IP2 and IP 3 are ongoing and outside the regulatory scope of license renewal. This comment does not present any significant new information that would warrant a change to the final SEIS.

The following comments express concern that the Draft SEIS does not adequately consider the socioeconomic effects under the no action alternative, Section 8.2, and does not accurately address the negative impacts that denying the request for license renewal would have on local communities.

9-g-AL/SO; 90-d-AL/EC/SO

Response: *The socioeconomic consequences of terminating operations and the shutdown of IP2 and IP3 on the communities and people living in the region around the power plants under*

the no action alternative is addressed in Chapter 8 of the SEIS. Any impact on electricity costs from the loss of IP2 and IP3 electrical generating capacity is speculative. Due to the deregulation of the energy market in the State of New York, competition may keep electricity costs under control.

Terminating nuclear plant operations was considered under the no action alternative, including the effects that reducing plant staff would have on regional employment and income and the quality and availability of community services. Nuclear power plants generate a significant amount of employment and income in the local economies, which would be reduced with the cessation of plant operations. Income from plant wages and salaries as well as expenditures for goods and services would decrease. Demand for services and housing would substantially decline. Indirect employment and income created as a result of nuclear power plant operations would also be reduced.

The termination of plant operations would also have an impact on population and housing. Loss of plant employment in rural communities would likely mean plant workers and their families would leave the area in search of jobs elsewhere, creating a decline in demand for housing, depressing housing prices and values. Conversely, housing markets in the vicinity of metropolitan areas generally experience more rapid, housing turnover, higher prices, and lower vacancy rates. While the loss of plant employment in urban regions may mean some out-migration of workers, many plant employees would be able to find other opportunities for employment. In addition, the socioeconomic impact on local communities from the termination of power plant operations could be offset by economic growth in other parts of the regional economy. These comments do not present any significant new information that would warrant a change to the final SEIS.

The following comments express concern that the strongest opposition to the renewal of the Indian Point operating license is coming from outside of the affected region:

56-b-SO; 109-d-SO/SR

Response: *These comments are generally supportive of Entergy and the license renewal of IP2 and IP3. These comments do not present any significant new information that would warrant a change to the final SEIS.*

The following comments assert that the socioeconomic effects from the shutdown of IP2 and IP3 would not be as severe as expected:

50-s-SO; 171-a-SO

Response: *Terminating nuclear plant operations and reducing plant staff would have an impact on regional employment and income and the quality and availability of community services. Nuclear power plants generate a significant amount of employment and income in the local economies, which would no longer occur with the cessation of plant operations. Income from plant wages and salaries as well as expenditures for goods and services would decrease. Demand for services and housing would be reduced. Indirect employment and income created as a result of nuclear power plant operations would also be reduced.*

The termination of plant operations would also have an impact on population and housing. Loss of plant employment in smaller communities would likely mean plant workers and their families would leave the area in search of jobs elsewhere, creating a decline in demand for housing, depressing housing prices and values. Conversely, housing markets in the vicinity of

metropolitan areas generally experience more rapid, housing turnover, higher prices, and lower vacancy rates. While the loss of plant employment in urban regions may mean some out-migration of workers, many plant employees would be able to find other opportunities for employment. In addition, any socioeconomic impact could be offset by economic growth in other parts of the regional economy.

Should the licenses not be renewed, the owner of the Indian Point property would continue to make property tax payments to the Town of Cortlandt, the Village of Buchanan, and the Hendrick Hudson Central School District. Depending on the commencement of decommissioning activities, some workers would continue to be employed at Indian Point for an extended period of time after the termination of power plant operations. The majority of the impacts associated with plant operations would cease with reactor shutdown; however, some impacts would remain unchanged, while others would continue at reduced or altered levels. Terminating nuclear power plant operations would not immediately lead to the dismantlement (decommissioning) of the reactor and infrastructure. Some socioeconomic impacts resulting from terminating nuclear plant operations could be mitigated through new uses of the land. Impacts from the decommissioning of IP2 and IP3 in the future would be similar to what would occur now if the licenses were not renewed. Other economic values (e.g., property values and eco-tourism) could have been diminished by the presence of Indian Point. These values might flourish after plant shutdown, decommissioning, and removal and could make up for some economic loss; however this issue along with Indian Point workers ability to change jobs is speculative.

These comments do not present any significant new information that would warrant a change to the final SEIS.

The following comment describes the economic connection between Indian Point and Rockland County and expresses concern that the loss of jobs and local tax revenue from the closure of Indian Point would have a financial impact on Rockland County. The comment also expressed concern about the potential negative effects that a shutdown of Indian Point would have on local and small businesses in the area.

148-a-AL/SO; 148-b-AL/SO; 148-c-AL/SO

Response: *Nuclear power plants, like various other electrical generating plants, generate a significant amount of employment and income in the economies of local counties. The local communities provide the people, goods, and services needed to operate the power plant. Power plant operations, in turn, provide wages and benefits for people, and payments for goods and services.*

Terminating nuclear plant operations and reducing plant staff would have an impact on regional employment and income and may affect the quality and availability of community services. Income from plant wages and salaries as well as expenditures would decrease. Demand for services and housing would substantially decline. Indirect employment and income created as a result of nuclear power plant operations would also be reduced.

The termination of plant operations would also have an impact on population and housing. Loss of plant employment in smaller communities would likely mean plant workers and their families would leave the area in search of jobs elsewhere, creating a decline in demand for housing, depressing housing prices and values. Conversely, housing markets in the vicinity of metropolitan areas generally experience more rapid, housing turnover, higher prices, and lower vacancy rates. While the loss of plant employment in urban regions may mean some out-

migration of workers, many plant employees would be able to find other opportunities for employment. In addition, any socioeconomic impact on small businesses in Rockland County could be offset by economic growth in other parts of the regional economy.

These comments are generally supportive of the license renewal of IP2 and IP3. These comments do not present any significant new information that would warrant a change to the final SEIS.

A.2.7.1 Demographics

The following comments express concern that Indian Point is located in one of the most densely populated regions of the United States, and it should not have been sited there. Comments indicate that it is irresponsible to have a nuclear power plant located so close to a major city, and that Indian Point could not get siting approval today because of the population density around the plant.

17-d-DE; 97-f-DE/PA; 121-a-DE/OR; 145-f-DE/OR; 153-e-AM/DE; 179-d-DE

Response: *As discussed in Section 2.2.8.5 in the SEIS, IP2 and IP3 are located in a high-population area. The NRC is responsible for licensing and regulating the operation of nuclear power plants to ensure the protection of public health and safety and the environment. The safe operation of nuclear power plants is not limited to license renewal but is dealt with on an ongoing basis as a part of the current operating licenses. Safety issues and concerns are addressed by the NRC on an ongoing basis at every nuclear power plant. Safety inspections are and will be conducted throughout the operating life of the plant, whether during the original or renewed operating license term. If safety issues are discovered at a nuclear power plant, they are addressed immediately, and any necessary changes are incorporated into the current operating license. As such, the regulatory safety oversight of IP2 and IP 3 is ongoing and outside the regulatory scope of license renewal. These comments do not present any significant new information that would warrant a change to the final SEIS.*

The following comments indicate concern that the Indian Point evacuation plan is unlikely to be effective, including evacuating children from schools, and that evacuation plans have not kept up with changing demographics or potential traffic issues.

13-g-DE/EP; 50-p-DE/EP/NE; 87-a-DE/EP; 125-a-DE/EP; 172-b-DE/EP

Response: *Before a plant is licensed to operate, the NRC must have "reasonable assurance that adequate protective measures can and will be taken in the event of a radiological emergency." The NRC's decision of reasonable assurance is based on licensees complying with NRC regulations and guidance. The emergency plans for nuclear power plants cover preparations for evacuation, sheltering, and other actions to protect residents near plants in the event of a serious incident. Nuclear power plant owners, government agencies, and State and local officials work together to create a system for emergency preparedness and response that will serve the public in the unlikely event of an emergency. Federal oversight of emergency preparedness for licensed nuclear power plants is shared by the NRC and Federal Emergency Management Agency (FEMA).*

As part of the reactor oversight process, the NRC reviews licensees' emergency planning procedures and training. These reviews include regular drills and exercises that assist licensees in identifying areas for improvement, such as in the interface of security operations and emergency preparedness. These reviews are used by the NRC to make radiological health

and safety decisions before issuing new licenses and in the continuing oversight of operating reactors. The NRC also has the authority to take action, including shutting down any reactor deemed not to provide reasonable assurance of the protection of public health and safety.

The Commission considered the need for a review of emergency planning issues in the context of license renewal during its rulemaking proceedings on 10 CFR Part 54, which included public notice and comment. As discussed in the statement of consideration for rulemaking (56 FR 64966), the programs for emergency preparedness at nuclear power facilities apply to all nuclear power facility licensees and require the specified levels of protection from each licensee regardless of plant design, construction, or license date. Requirements related to emergency planning are in the regulations at 10 CFR 50.47 and Appendix E to 10 CFR Part 50. These requirements apply to all operating licenses and will continue to apply to facilities with renewed licenses. Through its standards and required exercises, the Commission reviews existing emergency preparedness plans throughout the life of any facility, keeping up with changing age, race, and ethnographic demographics and other site-related factors.

The Commission has determined that there is no need for a special review of emergency planning issues in the context of an environmental review for license renewal. Therefore, decisions and recommendations concerning emergency preparedness at nuclear plants are ongoing and outside the regulatory scope of license renewal. These comments do not present any significant new information that would warrant a change to the final SEIS.

The following comments indicate concern that spent fuel at Indian Point is vulnerable to terrorist attack or an accident in the spent fuel pools. The comments indicate that an attack on spent fuel stored at the Indian Point site would be disastrous given the size of the surrounding population.

18-b-DE/ST; 54-b-DE/ST; 117-c-DE/ST; 122-a-DE/PA/ST; 126-a-DE/RW/SF/ST; 161-h-DE/ST

Response: *As discussed in Section 2.2.8.5 in the SEIS, IP2 and IP3 are located in a high-population area. The NRC requires that nuclear power plants be both safe and secure. Safety refers to operating the plant in a manner that protects the public and the environment. Security refers to protecting the plant (i.e., using people, equipment, and fortifications) from intruders who wish to damage or destroy it in order to harm people and the environment.*

Security issues such as safeguards planning are not tied to a license renewal action but are considered to be issues that need to be dealt with as a part of the current (and renewed) operating license. Security issues are reviewed and updated at every operating plant. These reviews continue throughout the period of an operating license, whether during the original or renewed license term. If issues related to security are discovered at a nuclear plant, they are addressed immediately, and any necessary changes are reviewed and incorporated under the operating license. As such, decisions and recommendations concerning safeguards and security at nuclear power plants are ongoing and outside the regulatory scope of license renewal.

After the terrorist attacks of September 11, 2001, the NRC issued security related orders and guidance to all nuclear power plants. These orders and guidance include interim measures for emergency planning. Nuclear industry groups and Federal, State, and local government agencies assisted in the prompt implementation of these measures and participated in drills and exercises to test these new planning elements. The NRC has reviewed licensees' commitments to address these requirements and verified the implementation through inspections to ensure public health and safety.

The NRC and other Federal agencies have heightened vigilance and implemented initiatives to evaluate and respond to possible threats posed by terrorists, including the use of aircraft against commercial nuclear power facilities and independent spent fuel storage installations. These acts remain speculative and beyond the regulatory scope of a license renewal review. However, the NRC assesses threats and other information provided by other Federal agencies and sources on an ongoing basis. The NRC also works to ensure that licensees meet security requirements through the ongoing regulatory process (routine inspections) as this issue affects all nuclear power plants. The issue of security and risk from terrorist acts against nuclear power plants is not unique to facilities that have requested a renewal to their operating licenses. These comments do not present any significant new information that would warrant a change to the final SEIS.

The following comments express concern about safety issues stemming from the possibility of corrosion in plant components, continued storage of spent fuel in aging spent fuel pools, and reliance on dry cask storage, in light of the high and growing population near the Indian Point site. Some commenters suggest that the population has a different set of characteristics with sensitive receptor issues that differ from those encountered at other reactor sites.

44-b-AM/DE/SF, 50-b-DE/PA, 50-h-DE/PA, 141-b-AM/DE/PA/RW, 170-c-DE/PA

Response: *As discussed in Section 2.2.8.5 in the SEIS, IP2 and IP3 are located in a high-population area. The NRC is responsible for licensing and regulating the operation of nuclear power plants to ensure the protection of public health and safety and the environment. Before a plant is licensed to operate, the NRC must have "reasonable assurance that adequate protective measures can and will be taken in the event of a radiological emergency." The NRC's decision of reasonable assurance is based on licensees complying with NRC regulations and guidance. Safety refers to operating the plant in a manner that protects the public and the environment.*

The safe operation of nuclear power plants is not limited to license renewal but is dealt with on an ongoing basis as a part of the current operating licenses. Safety issues and concerns are addressed by the NRC on an ongoing basis at every nuclear power plant. Safety inspections are and will be conducted throughout the operating life of the plant, whether during the original or renewed operating license. If safety issues are discovered at a nuclear power plant, they are addressed immediately, and any necessary changes are incorporated into the current operating license. As such, the regulatory safety oversight of IP2 and IP3 are ongoing and outside the regulatory scope of license renewal. Through its standards and required exercises, the Commission reviews existing emergency preparedness plans throughout the life of any facility, keeping up with changing age, race, and ethnographic demographics and other site-related factors.

The focus of the environmental review of IP2 and IP3 is on environmental impacts of license renewal and is distinct and separate from the safety review. Safety issues become important to the environmental review when they could result in environmental impacts, which are why the environmental effects of postulated accidents associated with IP2 and IP3 are considered in the IP SEIS. These comments do not present any significant new information that would warrant a change to the final SEIS.

A.2.7.2 Aesthetics

The following comment indicates that the SEIS does not consider the aesthetic impacts of the Indian Point facility and the construction of a cooling tower on communities along the Hudson River Valley.

30-a-AL/AQ/AS/EJ/GE

Response: *Aesthetic impacts were evaluated in the 1996 GEIS for license renewal of nuclear plants and are considered Category 1 issues. The NRC believes that the analysis conducted for the GEIS (which included a case study on Indian Point) bounds the impacts of continued operation and refurbishment on aesthetic resources, and that renewing the operating license would not alter the existing visual intrusiveness of any nuclear power plant. It is understood that some people (including minority and low-income populations) perceive nuclear plant structures (including cooling towers) and vapor plumes negatively. Most of these negative perceptions are based on aesthetic considerations (i.e., that the plant is out of character or scale with the environment), as well as environmental and safety concerns or on an anti-nuclear orientation. Whatever the consideration, the NRC believes that for these people the enjoyment of the environment has been diminished by the presence of a nuclear power plant. However, because license renewal would not alter the visual intrusiveness of the nuclear power plant, negative perceptions would remain unchanged, and the impacts of license renewal on aesthetic resources would therefore not change. Nevertheless, since these are Category 1 issues, the aesthetic impact of IP2 and IP3 was evaluated for new and significant information for the IP DSEIS.*

As discussed in Section 4.4 of the IP DSEIS, the NRC reviewed and evaluated the IP2 and IP3 Environmental Report, scoping comments, other available information, and visited the Indian Point Energy Center in search of new and significant information on aesthetic impacts that could change the conclusions presented in the GEIS. However, no new and significant information was identified during this review and evaluation. Therefore, it is expected that there would be no additional impact related to these Category 1 issues during refurbishment and the renewal term beyond those evaluated in the GEIS.

The aesthetic impacts of constructing and operating cooling towers at the Indian Point Energy Center is not part of the proposed action nor is it within the regulatory scope of license renewal. The aesthetic impacts of constructing and operating cooling towers is, however, discussed in Chapter 8 of the SEIS. The comment does not present any significant new information that would warrant a change to the final SEIS.

A.2.7.3 Socio-Psychological Effects

The following comments indicate that the SEIS does not analyze psychological and social stress impacts of nuclear power, accidents, safety, security, acts of terrorism, and emergency preparedness; and suggests that an independent third party prepare the SEIS:

16-a-PS; 16-b-PS/ST; 16-c-EP/PA/PS; 50-r-EP/PS

Response: *Psychological and social stresses do not constitute environmental impacts that are subject to evaluation under NEPA. Pursuant to NEPA and the NRC's environmental regulations at 10 CFR Part 51, the NRC is required to prepare an environmental impact statement for license renewal actions. The SEIS cannot be prepared by an independent third party as one of the commenters suggests. The comment does not present any significant new information that would warrant a change to the final SEIS.*

A.2.7.4 Environmental Justice

The following comments expressed support for nuclear power and the renewal of IP2 and IP3 operating licenses, because Indian Point provides clean, safe, and affordable electricity, and keeping Indian Point open means that families in the working-class and the low-income neighborhoods will not be held hostage to rapidly increasing electricity bills. They also expressed concerns about serious health issues and poor air quality in minority and low-income communities caused by air emissions from fossil-fueled power plants in their neighborhoods that would be used to generate electrical power if Indian Point were to be shut down. Of special concern is the issue of disproportionate health effects, especially asthma rates, experienced by low-income and minority communities, including African Americans and Hispanics.

14-a-AQ/EJ/SR; 14-d-AL/EJ/GL; 31-a-EJ/SR; 31-b-EC/EJ/HH; 45-a- AQ/EJ; 45-b-AL/EC/EJ; 46-b-AQ/EJ; 49-b-AQ/EJ; 49-d-AQ/EJ/SR; 49-f-AQ/EJ; 49-g-AL/AQ/EJ; 58-b-AL/AQ/EJ; 62-a-EJ/SR; 62-b-/EJ/SR; 118-a-AQ/EJ/SR; 118-b-EC/EJ/SR; 134-b-AL/AQ/EJ; 158-a-EJ/SR; 177-d-AQ/EJ/SR

Response: *These comments are generally supportive of nuclear power and the license renewal of IP2 and IP3. The NRC is responsible for licensing and regulating the operation of nuclear power plants to ensure the protection of public health and safety and the environment. Air quality impacts from alternative energy power generation including environmental justice concerns are discussed in Chapter 8 in the SEIS. These comments do not present any significant new information that would warrant a change to the final SEIS.*

The following comments pertain to the NRC staff's finding of a "small" impact level of the construction and operation of a closed-cycle cooling system at Indian Point, and asks why the 1996 GEIS does not address environmental justice as a generic issue.

14-b-AL/EJ; 46-c-AL/EJ/SR; 49-e-AL/EJ

Response: *The NRC has no role in energy planning decisions. State regulatory agencies, system operators, power plant owners, and, in some cases other Federal agencies, ultimately decide whether the power plant should continue to operate. The NRC has no authority or regulatory control over this decision. While the NRC considers a range of replacement power alternatives to license renewal, the only alternative within NRC's decision-making authority is whether or not to renew a plant's operating license. The NRC considers the decision to not renew the plant's operating license in the No-Action Alternative.*

The NRC also has no role in a decision regarding changes to nuclear power plant cooling systems (other than those involving safety-related issues) to mitigate adverse impacts; that decision is under the jurisdiction of State or other Federal agencies. The environmental impacts of closed cycle cooling systems (cooling towers) are discussed in Chapter 8 of the SEIS. Nevertheless, the discussion of potential impacts from the construction and operation of a closed-cycle cooling system has been revised in the final SEIS.

Environmental justice was not evaluated on a generic basis in the 1996 GEIS, because guidance for implementing Executive Order 12898 was not available prior to the completion of the 1996 GEIS. The analysis of environmental justice impacts are addressed in plant-specific reviews.

The following comments pertain to an inadequate discussion of evacuation plans and emergency planning in the DSEIS:

50-i-EJ/LE; 50-j-EJ/PA; 164-f-EJ/EP

Response: *All human health and environmental risks are considered during plant specific license renewal environmental reviews. In addition, all minority and low-income people are considered in NRC's assessment of environmental justice impacts. The environmental impacts of postulated accidents including severe accidents are discussed in Chapter 5. The Commission has generically determined that impacts associated with such accidents are SMALL because nuclear plants are designed to successfully withstand design basis accidents, and the probability weighted consequences (risk) of severe accidents are also SMALL.*

Providing projected growth rates of environmental justice communities would not present information needed to support or complete the environmental justice impact analysis since the location of existing minority and low-income populations have been identified and potential human health and environmental impacts to minority and low-income communities have been discussed. Minority and low-income populations would most likely remain where they are and grow in their current locations. In addition, no reason appears to suggest that these populations would materially change during the license renewal period, and projecting the growth of minority and low-income population would not necessarily increase the significance of any environmental justice impacts, should they exist.

The NRC staff performed a site specific evaluation which evaluated the impacts of the leaks of radioactive material at IPEC from a general human health perspective as well as from the environmental justice perspective using subsistence living factors. The evaluations are contained in Chapters 2 and 4 of the Draft SEIS. Additional information related to the human health aspects of these comments is addressed in the Human Health section of this appendix.

The safe operation of nuclear power plants is not limited to license renewal but is dealt with on a daily basis as a part of the operating license. Safety issues and concerns are addressed by the NRC on an ongoing basis at every nuclear power plant. Safety inspections are and will be conducted throughout the operating life of the power plant, whether during the original or renewed operating license term. If safety issues are discovered at a nuclear plant, they are addressed immediately, and any necessary changes are incorporated into the operating license. As such, the regulatory safety oversight of IP2 and IP 3 are ongoing and outside the regulatory scope of license renewal. Through its standards and required exercises, the Commission reviews existing emergency preparedness plans throughout the life of any facility, keeping up with changing age, race, and ethnographic demographics and other site-related factors.

The Commission considered the need for a review of emergency planning issues in the context of license renewal during its rulemaking proceedings on 10 CFR Part 54, which included public notice and comment. As discussed in the statement of consideration for rulemaking (56 FR 64966), the programs for emergency preparedness at nuclear power facilities apply to all nuclear power facility licensees and require the specified levels of protection from each licensee regardless of plant design, construction, or license date. Requirements related to emergency planning are in the regulations at 10 CFR 50.47 and Appendix E to 10 CFR Part 50. These requirements apply to all operating licenses and will continue to apply to facilities with renewed licenses.

The Commission has determined that there is no need for a special review of emergency planning issues in the context of an environmental review for license renewal. Therefore,

decisions and recommendations concerning emergency preparedness at nuclear plants are ongoing and outside the regulatory scope of license renewal. These comments do not present any significant new information that would warrant a change to the final SEIS.

The following comments are in opposition to concerns about an increase in air pollution in minority and low-income communities:

50-t-EJ/AL; 182-d-AL/EJ/OR

Response: *All human health and environmental risks are considered during plant specific license renewal environmental reviews. In addition, all minority and low-income people are considered in NRC's assessment of environmental justice impacts for alternatives presented in Chapter 8 of the SEIS. These comments do not present any significant new information that would warrant a change to the final SEIS.*

The following comments expressed concern that the Draft EIS does not adequately assess environmental justice and fails to consider immobile people with disabilities and institutionalized individuals in special facilities. One Commenter goes on to suggests that there may be a disparate impact on minority communities and subsistence fishermen for cancer related to radiation releases from Indian Point. Concern was also expressed about a large minority, low-income and disabled population in special facilities within 50 miles who will be severely impacted if there is an evacuation from the area from Indian Point. The Draft SEIS fails to take into account the high percentage of minority and low-income populations in the lower Hudson Valley region who engage in subsistence fishing. Another commenter indicates that the Draft EIS does not assess the impact of uranium mining on Native Americans and the disposal of the radioactive waste on environmental justice communities, and that the NRC Staff relies on incomplete demographic analyses and/or inconsistent data in making assessments. Another commenter suggests that the Draft EIS discusses the population within 20 miles of Indian Point based on 2000 census data without mention of the minority composition within 20 miles of Indian Point. The commenter also identifies the use of projected population growth rates for the total population during the license renewal period while not including projected growth rates for environmental justice communities over that same time period as an inconsistency.

One commenter also expresses concern that the NRC Staff relies on incomplete demographic analyses and/or inconsistent data in making assessments. For example, the Draft EIS discusses the population within 20 miles of Indian Point based on 2000 census data; however there is no mention of the minority composition within 20 miles of Indian Point. Another inconsistency found in the Draft EIS is the use of projected population growth rates for the total population during the license renewal period while not including projected growth rates for environmental justice communities over that same time period. The DSEIS does not evaluate the impacts of relicensing on the environmental justice communities in Peekskill, Haverstraw and West Haverstraw. Without complete and consistent data the Draft SEIS does not meet the minimum requirements of NEPA. The use of Census block groups in the analysis obscures smaller neighborhood concentrations of minority populations. Probable real-life impacts on environmental justice communities are neither presented nor analyzed. There is a particular need to consider the full range of health, accident risk, and terrorist risk impacts on minority populations residing immediately adjacent to Indian Point.

68-c-DE/EJ/NE; 79-h-EJ; 79-n-EJ; 79-o-EJ; 79-p-EJ; 79-q-EJ; 79-t-EJ; 96-i-EJ/UF

Response: *All minority and low-income people are considered in NRC's assessment of environmental justice impacts regardless of whether they are immobilized with disabilities and/or institutionalized (in federal or state prisons; local jails; federal detention centers; juvenile institutions; nursing or convalescent homes for the aged or dependent; or homes, schools, hospitals, or wards for the physically handicapped, mentally retarded, or mentally ill; or in drug/alcohol recovery facilities). The location of minority and low-income populations identified in a SEIS environmental justice assessment are determined on the basis of where they are living at the time of the census. All people living in the U.S. (including institutionalized persons) on April 1, 2000 were counted based on where they were living at the time.*

Before a plant is licensed to operate, the NRC must have "reasonable assurance that adequate protective measures can and will be taken in the event of a radiological emergency." The NRC's decision of reasonable assurance is based on licensees complying with NRC regulations and guidance. The emergency plans for nuclear power plants cover preparations for evacuation, sheltering, and other actions to protect residents near plants (including institutionalized persons) in the event of a serious incident. Nuclear power plant owners, government agencies, and State and local officials work together to create a system for emergency preparedness and response that will serve the public in the unlikely event of an emergency. Federal oversight of emergency preparedness for licensed nuclear power plants is shared by the NRC and Federal Emergency Management Agency (FEMA).

As part of the reactor oversight process, the NRC reviews licensees' emergency planning procedures and training. These reviews include regular drills and exercises that assist licensees in identifying areas for improvement, such as in the interface of security operations and emergency preparedness. These reviews are used by the NRC to make radiological health and safety decisions before issuing new licenses and in the continuing oversight of operating reactors. The NRC also has the authority to take action, including shutting down any reactor deemed not to provide reasonable assurance of the protection of public health and safety.

The Commission considered the need for a review of emergency planning issues in the context of license renewal during its rulemaking proceedings on 10 CFR Part 54, which included public notice and comment. As discussed in the statement of consideration for rulemaking (56 FR 64966), the programs for emergency preparedness at nuclear power facilities apply to all nuclear power facility licensees and require the specified levels of protection from each licensee regardless of plant design, construction, or license date. Requirements related to emergency planning are in the regulations at 10 CFR 50.47 and Appendix E to 10 CFR Part 50. These requirements apply to all operating licenses and will continue to apply to facilities with renewed licenses. Through its standards and required exercises, the Commission reviews existing emergency preparedness plans throughout the life of any facility, keeping up with changing age, race, and ethnographic demographics and other site-related factors.

The Commission has determined that there is no need for a special review of emergency planning issues in the context of an environmental review for license renewal. Therefore, decisions and recommendations concerning emergency preparedness at nuclear plants are ongoing and outside the regulatory scope of license renewal.

The NRC does not question the existence of subsistence fishing in close proximity to IP2 and IP3. The NRC staff reviewed the results of IPEC's radiological environmental monitoring program (REMP). The REMP monitoring results show that concentrations of radioactive contaminants in native leafy vegetation, soils and sediments, Hudson River surface water and fish from the vicinity of IPEC are very low (at or near the threshold of the survey instrument's

detection capability) and seldom above background levels. Based on the data, the NRC staff concluded that no disproportionately high and adverse human health impacts would be expected in special pathway receptor populations in the region as a result of subsistence consumption of fish and wildlife.

The NRC is also committed to ensuring that all nuclear materials including uranium fuel, spent fuel, and radioactive wastes are managed to prevent detrimental health impacts to the public. The radiological and nonradiological environmental impacts of the uranium fuel cycle were evaluated for all nuclear power plants on a generic basis in the 1996 GEIS. The review included a discussion of the values presented in Table S-3, Table of Uranium Fuel Cycle Environmental Data, presented in 10 CFR Part 51.

On the basis of the evaluation presented in the GEIS, the Commission concluded that, other than for the disposal of spent fuel and high-level waste, impacts on individuals from radioactive gaseous and liquid releases will remain at or below the Commission's regulatory limits. The aggregate nonradiological impact of the uranium fuel cycle resulting from the renewal of an operating license for any plant would be small.

The environmental impacts of individual operating uranium fuel cycle facilities (including uranium mining) are addressed in separate EISs prepared by the NRC. These documents include analyses that address human health and environmental impacts to minority and low-income populations. Electronic copies of these EISs are available through the NRC's public Web site in the Publications Prepared by NRC Staff document collection of the NRC's Electronic Reading Room at http://www.nrc.gov/reading-rm/doc-collections/; and the NRC's Agency wide Documents Access and Management System (ADAMS) at http://www.nrc.gov/reading-rm/adams.html.

The impacts of spent fuel and high level waste disposal have also been addressed on a generic basis. The human health impacts of transporting spent nuclear fuel are addressed in an addendum to the 1996 GEIS in which the NRC evaluated the applicability of Table S–4 to future license renewal proceedings given that the spent fuel was planned to be shipped to a single repository. Further, as part of the site characterization and recommendation process for the proposed geologic repository at Yucca Mountain, Nevada, DOE is required by the Nuclear Waste Policy Act of 1982 to prepare an EIS. By law, the NRC is required to adopt DOE's EIS, to "the extent practicable," as part of any possible NRC construction authorization decision. As a result, DOE prepared and submitted to NRC the Supplemental Environmental Impact Statement for a Geologic Repository for the Disposal of Spent Nuclear Fuel and High-Level Radioactive Waste at Yucca Mountain, Nye County, Nevada (Repository SEIS) DOE/EIS-0250F-S1. This document includes analyses that address human health and environmental impacts to minority and low-income communities including Native Americans.

As noted in DOE's Repository SEIS, shipments of spent nuclear fuel (as well as fresh fuel) would use the nation's existing railroads and highways. DOE estimates that transportation-related impacts to land use; air quality; hydrology; biological resources and soils; cultural resources; socioeconomics; noise and vibration; aesthetics; utilities, energy, and materials; and waste management would be small. The small effect on the population as a whole would be likely for any segment of the population, including minority and low-income populations, as well as members of American Indian tribes.

DOE did not identify any potentially high and adverse impacts to members of the public from the transport of spent nuclear fuel. DOE determined that subsections of the population, including

minority or low-income populations, would not receive disproportionate impacts, and no unique exposure pathways, sensitivities, or cultural practices that would expose minority or low-income populations to disproportionately high and adverse impacts were identified. DOE concluded that no disproportionately high and adverse impacts would result from the national transportation of spent nuclear fuel to Yucca Mountain. On September 8, 2008, NRC staff recommended that the Commission adopt, with supplementation, DOE's Repository EIS and supplements (73 FR 53284). While DOE subsequently requested the withdrawal of its Yucca Mountain repository application (which remains pending before the NRC), it has not identified any alternatives for the disposal of spent nuclear fuel and high-level waste, and the impact of any alternative disposal are speculative and cannot be evaluated at this time.

Complete and consistent demographic data has been presented in the Draft SEIS. Section 2.2.8.5 in the SEIS provides demographic (including minority composition) information on populations residing in Dutchess, Orange, Putnam, and Westchester counties in 2000 and 2006. These counties stretch out more than 20 miles from IP2 and IP3. As stated in the text and according to the U.S. Census Bureau's 2006 American Community Survey, minority populations in the four-county region were estimated to have increased by nearly 90,000 persons and made up 32.7 percent of the total four-county population in 2006 (see SEIS Table 2-13). This represents an increase of 19 percent relative to the total population from 2000 to 2006. The largest increases in minority populations were estimated to occur in Hispanic or Latino and Asian populations, an estimated increase of 29.2 percent since 2000, and a 2.9 percent increase as a percent of the total population. The Black or African-American population increased by approximately 5 percent from 2000 to 2006 but remained unchanged as a percentage of the total four-county population. Asian populations grew by approximately 37 percent since 2000, but this resulted in only a one percent increase as a percent of the total population.

Providing projected growth rates of environmental justice communities would not present information needed to support or complete the environmental justice impact analysis since the location of existing minority and low-income populations have been identified and potential human health and environmental impacts to minority and low-income communities have been discussed. Concentrations of minority and low-income populations would most likely remain where they are and grow in their current locations. In addition, no reason appears to suggest that these populations would materially change during the license renewal period, and projecting the growth of minority and low-income population would not necessarily increase the significance of any environmental justice impacts, should they exist.

The discussion and figures in Section 4.4.6 in the SEIS indentify concentrated locations of minority and low-income block group populations residing within a 50-mile (80-kilometer) radius of IP2 and IP3. Even though minority and low-income Census block groups were identified in these communities in the Draft SEIS, the SEIS has been revised to specifically note that Peekskill, Haverstraw and West Haverstraw have been identified as potential environmental justice areas.

While Census block data is preferred for identifying minority communities, Census block group data was chosen because poverty and income information is not available from Census at the block level. The NRC acknowledges that Census block data on race and ethnicity would further define the location of minority communities, and does not question the existence of these populations and communities in close proximity to IP2 and IP3. The NRC addresses environmental justice matters for license renewal through (1) identifying the location of minority and low-income populations that may be affected by the proposed license renewal, and (2)

examining any potential human health or environmental effects on these populations to determine if these effects may be disproportionately high and adverse.

As discussed in Section 2.2.8.5 in the IP SEIS, IP2 and IP3 are located in a high-population area. The NRC requires that nuclear power plants be both safe and secure. Safety refers to operating the plant in a manner that protects the public and the environment. Security refers to protecting the plant (i.e., using people, equipment, and fortifications) from intruders who wish to damage or destroy it in order to harm people and the environment.

Security issues such as safeguards planning are not tied to a license renewal action but are considered to be issues that need to be dealt with constantly as a part of the current (and renewed) operating license. Security issues are reviewed and updated at every operating plant. These reviews continue throughout the period of an operating license, whether the original or renewed license. If issues related to security are discovered at a nuclear plant, they are addressed immediately, and any necessary changes are reviewed and incorporated under the operating license. As such, decisions and recommendations concerning safeguards and security at nuclear power plants are ongoing and outside the regulatory scope of license renewal.

After the terrorist attacks of September 2001, the NRC issued security related orders and guidance to nuclear power plants. These orders and guidance include interim measures for emergency planning. Nuclear industry groups and Federal, State, and local government agencies assisted in the prompt implementation of these measures and participated in drills and exercises to test these new planning elements. The NRC has reviewed licensees' commitments to address these requirements and verified the implementation through inspections to ensure public health and safety.

The NRC and other Federal agencies have heightened vigilance and implemented initiatives to evaluate and respond to possible threats posed by terrorists, including the use of aircraft against commercial nuclear power facilities and independent spent fuel storage installations. These acts remain speculative and beyond the regulatory scope of a license renewal review. However, the NRC assesses threats and other information provided by other Federal agencies and sources on an ongoing basis. The NRC also works to ensure that licensees meet security requirements through the ongoing regulatory process (routine inspections) as this issue affects all nuclear power plants. The issue of security and risk from terrorist acts against nuclear power plants is not unique to facilities that have requested a renewal to their operating licenses. Nevertheless, the SEIS has been revised to more fully describe the overall potential human health and environmental effects that could affect minority and low-income populations. These comments do not present any significant new information that would warrant a change to the final SEIS.

The following comments express concern with the effects of Strontium-90 on subsistence fishermen and persons who eat fish from the Hudson River:

73-b-EJ/HH/LE; 73-c-EJ/HH/LE; 73-e-EJ/HH; 79-b-EJ/HH; 93-g-EJ/HH; 96-g-EJ/HH/LE; 97-a-EJ/HH; 97-k-EJ/HH/LE; 124-b-EJ/EP/HH/PA; 138-a-EJ/HH/LE; 149-b-EJ/HH

Response: *The NRC's primary mission is to protect the public health and safety and the environment from the effects of radiation from nuclear reactors, materials, and waste facilities. The NRC's regulatory limits for radiological protection are set to protect workers and the public from the harmful health effects of radiation on humans. The limits are based on the recommendations of standards-setting organizations. Radiation standards reflect extensive*

scientific study by national and international organizations. The NRC actively participates and monitors the work of these organizations to keep current on the latest information concerning radiation protection.

The NRC reviewed the results of IPEC's radiological environmental monitoring program (REMP). The REMP monitoring results show that concentrations of radioactive contaminants in native leafy vegetation, soils and sediments, Hudson River surface water and fish from the vicinity of IPEC are very low (at or near the threshold of the survey instrument's detection capability) and seldom above background levels. Based on the data, the NRC concluded that no disproportionately high and adverse human health impacts would be expected in special pathway receptor populations in the region as a result of subsistence consumption of fish and wildlife.

The NRC has already fully considered and addressed these issues in Chapters 2 and 4 of the SEIS and these comments do not present any significant new information that would warrant a change to the final SEIS.

The following comment expresses concern about the lack of an environmental justice discussion in the generic GEIS, and suggests that there's no framework or guidance for addressing environmental justice in the Draft SEIS. The lack of guidance at the generic level may lead to an inadequacy at the specific EIS components.

113-c-EJ/GE

Response: *Environmental justice was not evaluated on a generic basis in the GEIS, because guidance for implementing Executive Order 12898 was not available prior to its completion in 1996. The analysis of environmental justice impacts are addressed in plant-specific environmental reviews.*

NRC staff is guided in its consideration of environmental justice in plant-specific environmental reviews by Office of Nuclear Reactor Regulation (NRR), Office Instruction LIC-203, Appendix C "Environmental Justice in NRR NEPA Documents." The environmental justice review involves identifying minority and low-income populations in the vicinity of the plant that may be affected by license renewal, any concerns and potential environmental impacts that may affect these populations, including their geographic locations, the significance of such concerns and effects and whether they would be disproportionately high and adverse when compared to the general population, and if so, the mitigation measures available to reduce and/or eliminate these impacts. The NRC performs the environmental justice review to determine whether there would be disproportionately high and adverse human health and environmental effects on minority and low-income populations and report the results of this review in the SEIS. This comment does not present any significant new information that would warrant a change to the final SEIS.

The following comments express concern that the Draft SEIS failed to address, or inadequately addressed:

1. **Impact of cancer on minority and low-income populations that are more susceptible to cancer from Indian Point radionuclide emissions than other populations;**

2. **impact to subsistence fishing in the Hudson River;**

3. **fact that low-income populations will be more severely and negatively impacted by an evacuation resulting from a radiological event at Indian Point; (see also 79-u-EJ/SM)**

4. **the fact that disabled and institutionalized residents of special facilities will be more severely and negatively impacted by an evacuation or radiological event at Indian Point, including disabled patients in the dozens of hospitals and long term care facilities, and inmates in the many prisons in the area; and (see also 79-v-EJ/EP/SM)**

5. **environmental justice concerns relating to production and long term storage of Indian Point's fuel, especially upon Native American populations. (see also 79-y-EJ/UF)**

79-r-EJ

Response:

1. *Aspects of this comment related to cancer incidence due to radionuclide emissions from Indian Point are addressed in Chapter 4 of the SEIS and the Human Health portion of this Appendix.*

2. *Impacts to subsistence fishing are addressed in the "Subsistence Consumption of Fish and Wildlife" discussion in Section 4.4.6 Environmental Justice in the SEIS.*

3. *The emergency plans for nuclear power plants cover preparations for evacuation, sheltering, and other actions to protect residents near plants in the event of a serious incident. Nuclear power plant owners, government agencies, and State and local officials work together to create a system for emergency preparedness and response that will serve the public in the unlikely event of an emergency. Federal oversight of emergency preparedness for licensed nuclear power plants is shared by the NRC and Federal Emergency Management Agency (FEMA).*

   The Commission considered the need for a review of emergency planning issues in the context of license renewal during its rulemaking proceedings on 10 CFR Part 54, which included public notice and comment. As discussed in the statement of consideration for rulemaking (56 FR 64966), the programs for emergency preparedness at nuclear power facilities apply to all nuclear power facility licensees and require the specified levels of protection from each licensee regardless of plant design, construction, or license date. Requirements related to emergency planning are in the regulations at 10 CFR 50.47 and Appendix E to 10 CFR Part 50. These requirements apply to all operating licenses and will continue to apply to facilities with renewed licenses. Through its standards and required exercises, the Commission reviews existing emergency preparedness plans throughout the life of any facility, keeping up with changing age, race, and ethnographic demographics and other site-related factors.

   The Commission subsequently determined that there is no need for a special review of emergency planning issues in the context of an environmental review for license renewal. Therefore, decisions and recommendations concerning emergency

preparedness at nuclear plants are ongoing and outside the regulatory scope of license renewal.

4. *All minority and low-income people are considered in NRC's assessment of environmental justice impacts regardless of whether they are immobilized with disabilities and/or institutionalized (in federal or state prisons; local jails; federal detention centers; juvenile institutions; nursing or convalescent homes for the aged or dependent; or homes, schools, hospitals, or wards for the physically handicapped, mentally retarded, or mentally ill; or in drug/alcohol recovery facilities). The location of minority and low-income populations identified in a SEIS environmental justice assessment are determined on the basis of where they are living at the time of the census. All people living in the U.S. (including people living in prisons) on April 1, 2000 were counted based on where they were living at the time. Same response as 3.*

5. *The NRC is committed to ensuring that all nuclear materials including uranium fuel, spent fuel, and radioactive wastes are managed to prevent detrimental health impacts to the public. The radiological and nonradiological environmental impacts of the uranium fuel cycle are evaluated in the 1996 GEIS. The review included a discussion of the values presented in Table S-3, Table of Uranium Fuel Cycle Environmental Data, presented in 10 CFR Part 51.51.*

   On the basis of the evaluation presented in the GEIS, the Commission concluded that, other than for the disposal of spent fuel and high-level waste, impacts on individuals from radioactive gaseous and liquid releases will remain at or below the Commission's regulatory limits.

   As part of the site characterization and recommendation process for the proposed geologic repository at Yucca Mountain, Nevada, the DOE is required by the Nuclear Waste Policy Act of 1982 to prepare an EIS. By law, the NRC is required to adopt DOE's EIS, to "the extent practicable," as part of any possible NRC construction authorization decision. As a result, DOE prepared and submitted to NRC the Supplemental Environmental Impact Statement for a Geologic Repository for the Disposal of Spent Nuclear Fuel and High-Level Radioactive Waste at Yucca Mountain, Nye County, Nevada (Repository SEIS) DOE/EIS-0250F-S1. This document includes analyses that address human health and environmental impacts to minority and low-income communities including Native Americans.

The following comments express concern that low-income populations, residents of special facilities, including disabled patients and inmates in prisons will be more severely and negatively impacted by an evacuation resulting from a radiological event at Indian Point. Potential impacts upon disabled and institutionalized individuals was completely ignored, and the relicensing of Indian Point places these individuals, including children, seniors, and veterans at risk.

79-u-EJ/SM; 79-v-EJ/EP/SM; 79-w-EJ

Response: *All minority and low-income people are considered in NRC's assessment of environmental justice impacts regardless of whether they are immobilized with disabilities and/or institutionalized (in federal or state prisons; local jails; federal detention centers; juvenile institutions; nursing or convalescent homes for the aged or dependent; or homes, schools, hospitals, or wards for the physically handicapped, mentally retarded, or mentally ill; or in drug/alcohol recovery facilities). The location of minority and low-income populations identified*

in a SEIS environmental justice assessment are determined on the basis of where they are living at the time of the census. All people living in the U.S. (including people living in prisons) on April 1, 2000 were counted based on where they were living at the time.

The NRC is responsible for licensing and regulating the operation of nuclear power plants to ensure the protection of public health and safety and the environment. The safe operation of nuclear power plants is not limited to license renewal but is dealt with constantly on a daily basis as a part of the operating license. Safety issues and concerns are addressed by the NRC on an ongoing basis at every nuclear power plant. Safety inspections are and will be conducted throughout the operating life of the power plant, whether during the original or renewed operating license term. If safety issues are discovered at a nuclear plant, they are addressed immediately, and any necessary changes are incorporated into the operating license. As such, the regulatory safety oversight of IP2 and IP 3 are ongoing and outside the regulatory scope of license renewal.

Before a plant is licensed to operate, the NRC must have "reasonable assurance that adequate protective measures can and will be taken in the event of a radiological emergency." The NRC's decision of reasonable assurance is based on licensees complying with NRC regulations and guidance. The emergency plans for nuclear power plants cover preparations for evacuation, sheltering, and other actions to protect residents near plants in the event of a serious incident. Nuclear power plant owners, government agencies, and State and local officials work together to create a system for emergency preparedness and response that will serve the public in the unlikely event of an emergency. Federal oversight of emergency preparedness for licensed nuclear power plants is shared by the NRC and Federal Emergency Management Agency (FEMA).

As part of the reactor oversight process, the NRC reviews licensees' emergency planning procedures and training. These reviews include regular drills and exercises that assist licensees in identifying areas for improvement, such as in the interface of security operations and emergency preparedness. These reviews are used by the NRC to make radiological health and safety decisions before issuing new licenses and in the continuing oversight of operating reactors. The NRC also has the authority to take action, including shutting down any reactor deemed not to provide reasonable assurance of the protection of public health and safety.

The Commission considered the need for a review of emergency planning issues in the context of license renewal during its rulemaking proceedings on 10 CFR Part 54, which included public notice and comment. As discussed in the statement of consideration for rulemaking (56 FR 64966), the programs for emergency preparedness at nuclear power facilities apply to all nuclear power facility licensees and require the specified levels of protection from each licensee regardless of plant design, construction, or license date. Requirements related to emergency planning are in the regulations at 10 CFR 50.47 and Appendix E to 10 CFR Part 50. These requirements apply to all operating licenses and will continue to apply to facilities with renewed licenses. Through its standards and required exercises, the Commission reviews existing emergency preparedness plans throughout the life of any facility, keeping up with changing age, race, and ethnographic demographics and other site-related factors.

The Commission has determined that there is no need for a special review of emergency planning issues in the context of an environmental review for license renewal. Therefore, decisions and recommendations concerning emergency preparedness at nuclear plants are ongoing and outside the regulatory scope of license renewal. These comments do not present any significant new information that would warrant a change to the final SEIS.

The commenter wants the Final SEIS to address the impact on employment for environmental justice communities and low-income populations.

79-x-AL/EJ

Response: *The NRC addresses environmental justice matters for license renewal through (1) identifying the location of minority and low-income populations that may be affected by the proposed license renewal, and (2) examining any potential human health or environmental effects on these populations to determine if these effects may be disproportionately high and adverse. The SEIS provides a discussion of potential impacts to minority and low-income populations from license renewal, refurbishment (vessel head replacement), and replacement power alternatives, including potential employment impacts.*

Socioeconomic conditions in minority and low-income communities would not change as a result of renewing the IP2 and IP3 operating licenses. Employment levels would remain relatively unchanged, so direct and indirect employment opportunities caused by IPEC would remain unchanged. Therefore, there would be no additional socioeconomic impact to minority and low-income populations during the license renewal term beyond what is currently being experienced. The SEIS has been revised to more fully describe the overall potential human health and environmental effects of license renewal that could affect minority and low-income populations.

The following comment expresses environmental justice concerns relating to production and long term storage of Indian point's fuel, especially upon Native American populations

79-y-EJ/UF

Response: *The NRC is committed to ensuring that all nuclear materials including uranium fuel, spent fuel, and radioactive wastes are managed to prevent detrimental health impacts to the public. The radiological and nonradiological environmental impacts of the uranium fuel cycle are evaluated in the 1996 GEIS. The review included a discussion of the values presented in Table S-3, Table of Uranium Fuel Cycle Environmental Data, presented in 10 CFR Part 51.51.*

On the basis of the evaluation presented in the GEIS, the Commission concluded that, other than for the disposal of spent fuel and high-level waste, impacts on individuals from radioactive gaseous and liquid releases will remain at or below the Commission's regulatory limits.

As part of the site characterization and recommendation process for the proposed geologic repository at Yucca Mountain, Nevada, the DOE is required by the Nuclear Waste Policy Act of 1982 to prepare an EIS. By law, the NRC is required to adopt DOE's EIS, to "the extent practicable," as part of any possible NRC construction authorization decision. As a result, DOE prepared and submitted to NRC the Supplemental Environmental Impact Statement for a Geologic Repository for the Disposal of Spent Nuclear Fuel and High-Level Radioactive Waste at Yucca Mountain, Nye County, Nevada (Repository SEIS) DOE/EIS-0250F-S1. This document includes analyses that address human health and environmental impacts to minority and low-income communities including Native Americans. This comment does not present any significant new information that would warrant a change to the final SEIS.

A.2.8 Comments Concerning Land Use Issues

The following comment indicates that the SEIS does not analyze offsite land use impacts of continued operations and the additional storage of spent fuel on real estate values in the surrounding areas.

129-d-AL/LU

Response: *The impacts evaluated for the 1996 GEIS (NUREG-1437) identified 92 environmental issues that were considered for the license renewal of nuclear power plants. Members of the public, citizen groups, industry representatives, and other Federal, state, and local governmental agencies commented on and helped identify these 92 issues during the preparation of the GEIS. Offsite land use impacts were determined to be Category 2 issues to be addressed in plant-specific supplemental environmental impact statements (SEISs). The impact of nuclear plant operations on real estate values was not identified as an issue to be addressed by license renewal.*

The regulatory authority over licensee economics (including the need for power and the No Action Alternative) falls largely within the jurisdiction of the states and to some extent within the jurisdiction of the Federal Energy Regulatory Commission. The proposed rule for license renewal had included a cost-benefit analysis and consideration of licensee economics as part of the National Environmental Policy Act (NEPA) review. However, during the comment period, state, Federal, and licensee representatives expressed concern about the use of economic costs and cost-benefit balancing in the proposed rule and the GEIS. They noted that President's Council on Environmental Quality (CEQ) regulations interpret NEPA to require only an assessment of the cumulative effects of a proposed Federal action on the natural and man-made environment and that the determination of the need for generating capacity has always been the states' responsibility. For this reason, the purpose and need for the proposed action (i.e., license renewal) is defined in the 1996 GEIS as follows:

> *The purpose and need for the proposed action (renewal of an operating license) is to provide an option that allows for power generation capability beyond the term of a current nuclear power plant operating license to meet future system generating needs, as such needs may be determined by State, licensee, and, where authorized, Federal (other than NRC) decision-makers.*

The SEIS for license renewal is not required to address the economic costs and economic benefits of the proposed action or of alternatives to the proposed action. In addition, the SEIS need not discuss other issues not related to the environmental effects of the proposed action and the alternatives, or any aspect of the storage of spent fuel for the facility within the scope of the generic determination in § 51.23(a) and in accordance with § 51.23(b) (see 10 CFR 51.95 (c)(2)). The draft SEIS must contain an analysis of issues identified as Category 2 in appendix B to subpart A of this part that are open for the proposed action. Table B-1 summarizes the Commission's findings on the scope and magnitude of environmental impacts of renewing the operating license for a nuclear power plant as required by section 102(2) of the National Environmental Policy Act of 1969, as amended.

Offsite land use impacts of spent fuel storage in an ISFSI are not part of the proposed action and are not within the regulatory scope of license renewal and therefore are not addressed in the IP DSEIS. These impacts have been addressed as part of a separate NEPA review conducted by the NRC.

The comment does not present any significant new information that would warrant a change to the final SEIS.

A.2.9 Comments Concerning Postulated Accidents

The following comments assert that studies by Lamont-Doherty Earth Observatory show that the Indian Point plant may be more vulnerable to earthquakes than previously thought because it sits less than a mile south of a newly-identified seismic zone (Ramapo Fault) running from Stamford, Connecticut, to Peekskill, New York. It appears that this information was not included in the draft SEIS. We recommend that NRC include and analyze any new geologic and seismic data in the final SEIS, particularly concerning recent seismic activity occurring in the northern New Jersey-New York metropolitan region.

9-c-LE/OE/PA/RW, 10-d-OE/PA, 13-c-PA/SF/ST, 32-a-AM/OP/PA, 51-a-HH/PA/UF, 55-e-PA, 55-f-AE/PA/RW, 71-b-OE/PA, 76-b-OR/PA, 79-j-HH, 87-b-HH/PA/RW/ST, 97-g-EP/OE/PA, 102-j-OE/PA, 124-b-EJ/EP/HH/PA, 129-e-SM; 140-ii-SM; 162-d-GW/LE/PA, 164-a-OE/PA/ST, 174-d-PA, 179-c-PA, 180-e-OE/PA, and 183-c-EP/HH/PA

The following comments assert that, given the proximity of the Indian Point site to the Ramapo Fault, the NRC should provide a site-specific analysis of whether the dry casks and the spent fuel pools would be able to withstand a significant earthquake.

10-a-OE/PA; 20-a-PA/SF/ST; 96-j-LR/PA/RW; 129-e-SM; 140-ii-SM

Response: *Insofar as these comments raise a safety issue, these comments are not unique to the license renewal action; rather, they pertain to the current operating license and are being addressed as a part of the current operating license reactor oversight process. The NRC staff is aware that recent updates to seismic data and models indicate that estimates of the earthquake hazard at some nuclear plant sites in the Central and Eastern United States (CEUS) may be larger than previous estimates. Based on a preliminary review of the updated seismic data and models, the NRC staff concluded that the seismic hazards remain small in an absolute sense and that the currently operating plants in the CEUS remain safe. Nevertheless, the NRC staff determined that the recent data and models warrant further study and analysis. Those activities have been initiated and are being pursued under the Generic Issue Program (GIP) as Generic Issue 199, "Implications of Updated Probabilistic Seismic Hazard Estimates in Central and United States on Existing Plants." This issue is now in the Safety/Risk Assessment stage of the GIP, in which the NRC staff is collecting and analyzing hazard information from the US Geological Survey and other sources, and developing an up-to-date understanding of the seismic spectra at each site. Should the NRC staff evaluations determine the seismic risk increase exceeds established safety values, GI-199 will proceed to the Regulatory Assessment stage of the GIP, where appropriate regulatory actions would be identified.*

Insofar as the comments suggest that a seismic event during the period of license renewal could result in environmental impacts, such impacts were considered as part of the SEIS discussion of severe accidents initiated by external phenomena and by the GEIS in its "Review of Existing Impacts." As discussed in section 5.1.2 of the draft SEIS, the NRC staff evaluated the risk of beyond-design-basis earthquakes at existing nuclear power plants, and determined that the risk from such events is SMALL; further, the NRC determined that the risks from other external events are adequately addressed by the generic consideration of internally-generated severe accidents in the GEIS, and that this issue should be considered on a site-specific basis in a plant's SAMA analysis. Entergy's SAMA analysis included a search for mitigation measures for accident scenarios initiated by fire and seismic external events (see section G.2.2 of the draft SEIS). In addition, Entergy increased the benefit derived from the internal event PRA by a multiplication factor to account for the combined contribution from internal and external events. The NRC staff has not identified any new and significant information with

regard to the environmental consequences of a severe accident at IP2 and IP3, including externally-initiated accidents. The comment provides no new and significant information; therefore no changes were made to the SEIS in response to this comment.

The following comments assert that the Indian Point plant and spent fuel are potential targets of a terrorist attack based upon their proximity to the New York City metropolitan area; they also assert that the draft SEIS ignores the possibility – as well as the possible effects on the environment and public health – of another terrorist attack.

13-c-PA/SF/ST, 38-b-PA/RW/ST, 39-c-PA/ST, 50-m-PA/ST, 87-b-HH/PA/RW/ST, 102-d-OW/PA/ST, 128-r-SM/UF; 129-o-SM

Response: *The NRC and other Federal agencies have heightened vigilance and implemented initiatives to evaluate and respond to possible threats posed by terrorists, including the use of aircraft against commercial nuclear power facilities and independent spent fuel storage installations. While these are legitimate matters of concern, they will continue to be addressed through the ongoing regulatory process as a current and generic regulatory issue that affects all nuclear facilities and many of the activities conducted at nuclear facilities. The issue of security and risk from malevolent acts at nuclear power facilities is not unique to facilities that have requested a renewal of their licenses. In the Pilgrim license renewal proceeding, the Commission affirmed that the National Environmental Policy Act (NEPA) imposes no legal duty to consider malevolent acts in conjunction with license renewal (CLI-10-14). In any event, the NRC performed a discretionary analysis of terrorism in developing the GEIS. The NRC concluded that core damage and radiological release from such acts would be no worse than the damage and release from internally initiated events. The comment is outside the scope of a plant-specific license renewal review; therefore, no changes were made to the SEIS in response to this comment.*

The following comments assert that the draft SEIS fails to address the effects of a spent fuel pool fire at Indian Point, in particular, the release of cesium-137 from the spent fuel pools.

13-d-PA/SF, 89-a-HH/PA/SF; 140-hh-SM

Response: *As noted by the ASLB in LBP-08-13, "spent fuel pool fires are Category 1 environmental issues and are addressed generically in the GEIS for license renewal. The Commission reaffirmed this designation in Vermont Yankee/Pilgrim" (CLI-07-3). The Commission has subsequently reviewed two related petitions for rulemaking seeking to overturn this classification, and has denied these petitions on the basis that the risk of a fire is very low. As such, a plant-specific analysis of the effects of a spent fuel pool fire is not required. Spent fuel pools are robust structures constructed of very thick steel-reinforced concrete walls and possess a stainless steel liner. They contain enormous quantities of water, and as a result for most events, plant operators would have significant amounts of time to correct any problems. In addition, nuclear plants possess many other sources of cooling water that are readily available for cooling spent fuel. Recently, the Commission reiterated that a "'SAMA that addresses [spent fuel pool] accidents would not be expected to have a significant risk for the site' because the spent fuel pool accident 'risk level is less than that for a reactor accident." (CLI-10-14). The*

comment is outside the scope of a plant-specific license renewal review; therefore, no changes were made to the SEIS in response to this comment.

The following comment asserts that the DSEIS (in Section 5.1.2) acknowledges that "[s]evere nuclear accidents.., such as... floods, earthquakes, fires, and sabotage, traditionally have not been discussed in quantitative terms in [past environmental documents] and were not specifically considered for IP2 and IP3 in the GEIS." This section continues, however, to note that NRC did evaluate impact assessments at 44 other nuclear plants and concluded that the risk from these types of events at those plants is small.

17-e-NE/PA

Response: *In the GEIS (Section 5.3.3.1), the Commission concluded that the risk from sabotage and beyond-design-basis events at existing nuclear power plants is small, and additionally, that the risks from other external events are adequately addressed by a generic consideration of internally-initiated severe accident. These conclusions were based on the results of detailed external event probabilistic risk assessments for a limited number of plants, together with additional rationale that supports the extrapolation of the findings to the entire population of plants. Based on the information in the GEIS, the Commission found that the probability weighted consequences of atmospheric releases, fallout onto open bodies of water, releases to groundwater, and societal and economic impacts from severe accidents are small for all plants, and codified this result in 10 CFR Part 51. Thus, the Commission addressed these impacts in the GEIS.*

It should be noted that the statement in the DSEIS that "severe accidents initiated by external phenomena… were not specifically considered for IP2 and IP3 in the GEIS" is not completely correct. As indicated on page 5-17 of the GEIS, the NRC staff reviewed or performed detailed probabilistic assessments of external events for a number of plants, including IP2 and IP3. This statement will be corrected in the FSEIS.

The following comments assert that the population density around Indian Point is much higher than that around any other nuclear power station in the country. An accident at Indian Point would have a potentially much greater impact on human health and safety than a similar event at a nuclear power station in a less urbanized part of the country. The Draft SEIS does not adequately consider the millions of lives that would be destroyed in the event of a disaster, or the population growth at Indian Point. Because the magnitude of these impacts does not parallel the situation at other reactors, the SEIS must address questions of risk that are ruled out in the GEIS.

17-f-PA, 17-n-EP/PA/ST, 50-b-DE/PA, 50-c-PA, 50-h-DE/PA, 97-f-DE/OE/PA, 122-a-DE/PA/ST, 170-c-DE/PA, 170-f-HH/PA/UF

The following comments assert that the environmental impact statement needs to consider operation of an aging nuclear facility within a highly populated area and include modeling to determine the possible outcome of accidents.

22-a-HH/OR/OS/PA, 145-a-AM/PA, 171-b-PA/ST

Response: *The methodology used in the GEIS to predict the environmental impacts of postulated accidents accounts for the site-specific population within 50-miles of each nuclear power plant including Indian Point, and the projected growth of this population through the license renewal period (year 2030 for Indian Point). See GEIS Chapter 5. Based on this methodology, it was recognized that plant sites with larger populations, such as Indian Point, have a larger number of persons at risk for a given severe accident release, and that an accident would have higher impacts on human health and safety than a similar event at a nuclear power station in a less urbanized part of the country. Thus, the issue of large population size was considered in the GEIS. Moreover, the population in the vicinity of IP2 and IP3 was fullly considered in Entergy's SAMA analysis, which utilizes the projected population to determine the potential costs associated with severe accidents. The comments provide no new or significant information; therefore, no changes were made to the SEIS in response to these comments. These comments are outside the scope of the license renewal review; therefore, no changes were made to the SEIS in response to these comments.*

The following comment asserts that the probability of an accident, no matter how remote, does not diminish the severity of an accident should it occur. Therefore, weighting the severity as a function of probability is meaningless. Unless it can be shown that the probability is really zero, then the consequences pertain, and they need to be fully described, analyzed, and mitigated.

50-j-EJ/PA

Response: *The GEIS provides an evaluation of the environmental impacts of two classes of postulated accidents – design basis accidents and severe accidents. Design basis accidents are those that both the licensee and the NRC staff evaluate to ensure that the plant meets acceptable design and performance criteria. The results of these accidents are not probabilistically-weighted since they are considered to be within the scope of the licensing basis, and can be expected to occur within the lifetime of the population of operating plants. Severe accidents are events beyond the design basis of the plant. Although the environmental consequences of severe accidents can be substantially greater than for design basis accidents, the likelihood of severe accidents is extremely small. Thus, the GEIS presents the environmental impacts of severe accidents in a risk context, wherein risk is expressed as the product of the frequency of the event and the consequences of the event. This same approach was used to address the environmental impacts of severe accidents in plant-specific final environmental statement (FES) reports published since 1980 (see GEIS Section 5.3.3.1). This approach does not diminish the severity of an accident, but presents this information from a risk perspective so that severe accident risks can be compared with that for other risks. The comment is outside the scope of a plant-specific license renewal review; therefore no changes were made to the SEIS in response to this comment.*

The following comments assert that the fact that the draft SEIS examines mitigation for accidents but not the consequences of accidents is inappropriate, and the brief treatment of different scenarios in Tables 5.3 - 5.4 falls short of meeting the need for analysis of accidents. This section must be expanded in the final SEIS to present a thorough analysis of what it would mean for the affected populations should any of the potential event scenarios unfold.

50-k-PA, 50-l-HH/PA, 50-m-PA/ST, 155-b-PA

Response: *A detailed discussion of accident consequences is presented in Section 5.2 of the GEIS. This includes consideration of multiple exposure pathways (i.e., atmospheric releases, fallout onto open bodies of water, and groundwater releases), and additional risk metrics (e.g., early and latent fatalities, economic impacts, and land contamination). The GEIS concluded that the probabilistically-weighted consequences due to severe accidents are of small significance for all plants. Thus, these consequences need not be addressed in the SEIS.*

The ER and SEIS do include additional, plant-specific information regarding the frequency and consequences of severe accidents as part of the severe accident mitigation alternatives analysis. See, e.g., SEIS Chapter 5. However, the scope of the consequence information presented therein is limited to that which is necessary to assess the risk reduction associated with candidate design alternatives in accordance with established NRC regulatory analysis guidelines. The comment is outside the scope of a plant-specific license renewal review; therefore no changes were made to the SEIS in response to this comment.

A.2.10 Comments Concerning Severe Accident Mitigation Alternatives (SAMAs)

The following comments assert that the draft SEIS notes that some SAMAs were potentially cost beneficial, but need not be implemented as part of license renewal pursuant to 10 CFR 54 because they do not relate to adequately managing the effects of aging during the re-licensing period. An EIS must rigorously explore and objectively evaluate all reasonable alternatives, and not defer their further analysis to some undetermined point in the future. We urge Entergy to continue to refine and implement these alternatives as they appear to be cost beneficial and would mitigate the impact of a severe accident should one occur.

55-d-SM, 137-b-GW/PA/RW/SF, 137-f-AL/LE/PA/RF/SF, 137-i-PA, 170-d-PA/SM

Response: *The SAMA analysis constitutes a systematic and comprehensive process for identifying potential plant improvements, evaluating the implementation costs and risk reduction for each SAMA, and determining which SAMAs may be cost beneficial to implement. . The analysis is technically rigorous and consistent with the NEPA expectation that federal agencies take a "hard-look" at the environmental impacts of their proposed actions, including consideration of viable alternatives. If a SAMA is determined to be potentially cost beneficial but is not related to adequately managing the effects of aging during the re-licensing period, it is not required to be implemented as part of license renewal pursuant to 10 CFR Part 54. Further refinement beyond determining whether a SAMA is potentially cost beneficial is not necessary for an objective evaluation. Nevertheless, potentially cost-beneficial alternatives are identified and considered as part of the license renewal process, and licensees often commit to further evaluate the most promising cost-beneficial SAMAs among those that have been identified, for possible future implementation in order to further reduce plant risk, as Entergy has done for Indian Point. Such a commitment to perform a further evaluation is not a condition of granting a renewed license. Accordingly, a license renewal applicant's decision to defer this further evaluation of the potentially cost-beneficial SAMAs which it has identified, to some point in the future (i.e., outside the license renewal SAMA review), is acceptable. The comments provide no new and significant information; therefore, no changes were made in the SEIS in response to this comment.*

The following comment assert that the SAMA analysis in the DSEIS is defective because it incorporated an outdated air dispersion model (i.e., the ATMOS air dispersion module in the MACCS2 computer code) that will not accurately predict the dispersion of radionuclides traversing a complex terrain over long distances. An accurate SAMA analysis depends on the accuracy of the estimates of human exposure to radiation from a severe accident, which in turn depends on the validity of air dispersion models used to predict the manner in which radiation will be geographically dispersed through the atmosphere. ATMOS's simplistic assumptions directly affect its ability to accurately model the dispersion of radioactivity from the Indian Point plant.

97-e-PA, 129-m-SM

Response: *The MACCS2 code was developed under NRC sponsorship for use in evaluating the potential impacts of severe accidents at nuclear power plants on the surrounding public. The MACCS2 code considers, among other things, phenomena related to atmospheric transport and deposition under time variant meteorology, short- and long-term mitigative actions, potential exposure pathways, deterministic and stochastic health effects, and economic costs. The NRC is aware of no model other than the MACCS2 code that fully addresses each factor completely. The issue of concern in a SAMA analysis is not the results of a single meteorological data trial but the results of numerous meteorological trials that provide the mean dispersion over the entire 50-mile radius. In this regard, the atmospheric transport model used in MACCS2 has been found to generally perform as well as several more modern atmospheric transport models (Ref. NUREG/CR-6853), and within the level of accuracy of other portions of the analysis. As such, the MACCS2 model has proven its acceptability for the purpose of conducting a SAMA analysis. The adequacy of the atmospheric transport model used in the MACCS2 code was raised in a contention filed by the State of New York in the license renewal adjudicatory proceeding. The contention includes the criticisms mentioned above and has been admitted for litigation by the ASLB. Additional discussion of the atmospheric transport model and its impact on the SAMA analysis has been provided in Section G.2.3 of Appendix G of the FSEIS.*

The following comment asserts that the projections of the 2035 population likely to be living within 50 miles of Indian Point, on which the SAMA analysis is based, appear to underestimate the potential exposed population. It was projected that in 2035 the population of New York County (Manhattan) will be 1,570,657, whereas data from the U.S. Census estimates that in 2007 Manhattan's population was 1,620,867 – over 50,000 more than Entergy asserts would be at risk 29 years later.

129-m-SM

Response: *A concern regarding the adequacy of the population projections used in the SAMA analysis was raised in a contention filed by the State of New York in the license renewal adjudicatory proceeding. The contention includes the criticisms mentioned above and has been admitted for litigation by the ASLB. Additional discussion of the population projections and their impact on the SAMA analysis has been provided in Section G.2.3 of Appendix G to the FSEIS.*

The following comment asserts that the cost formula contained in the MACCS2 computer program underestimates the decontamination costs likely to be incurred as a result of a dispersion of radiation. The NRC Staff should use the analytical framework contained in the 1996 Sandia National Laboratories report concerning site restoration costs (D. Chanin and W. Murfin, "*Site Restoration: Estimation of Attributable Costs from Plutonium-Dispersal Accidents*," SAND96-0957). The NRC Staff should revise the Sandia

results for the densely populated and developed New York City area, incorporate the region's property values, and ensure that the resulting financial costs are expressed in present value and future value.

129-n-SM

Response*: A concern regarding the adequacy of the decontamination cost estimates used in the SAMA analysis was raised in a contention filed by the State of New York in the license renewal adjudicatory proceeding. The contention includes the criticisms mentioned above and has been admitted for litigation by the ASLB. Additional discussion of the decontamination cost estimates and their impact on the SAMA analysis has been provided in Section G.2.3 of Appendix G to the FSEIS.*

The following comments assert that the SAMA assessment is flawed because it fails to consider the risks and the contribution to severe accident costs from intentional attacks on Indian Point. Conventional PRA techniques can be adapted for this analysis by postulating an initiating event (malicious act) and then examining the outcomes of that event. The SAMA assessment should address National Infrastructure Protection Plan principles for increasing the inherent robustness of infrastructure facilities against attack, and should consider the mitigation measures recommended by the 2006 NAS Study to reduce the risk of impacts from intentional attacks, including: additional surveillance to detect and/or thwart attacks, creating earthen berms to protect casks from aircraft strikes, placing visual barriers around storage pads to prevent targeting of individual casks, re-spacing the casks to reduce likelihood of cask-to-cask interactions in the event of aircraft attack, and implementing design changes to newly manufactured casks to improve cask resistance to attack.

128-r-SM/UF, 140-bb-SM, 140-jj-SM

Response: *The NRC and other Federal agencies have heightened vigilance and implemented initiatives to evaluate and respond to possible threats posed by terrorists, including the malevolent use of aircraft against commercial nuclear power facilities and independent spent fuel storage installations. The NRC has required, and nuclear power plants have implemented, various security and mitigation measures that, along with the robust nature of nuclear power plants and spent fuel pools, make the probability of a successful terrorist attack (i.e., one that causes the release of a large amount of radioactive material into the environment) very low. In the Pilgrim license renewal proceeding, the Commission affirmed that NEPA imposes no legal duty to consider malevolent acts in conjunction with license renewal (CLI-10-14). In any event, the NRC performed a discretionary analysis of terrorism in developing the GEIS. The NRC concluded that core damage and radiological release from such acts would be no worse than the damages and release from internally initiated events. Thus, on this basis the NRC staff finds that the environmental impacts of renewing a nuclear power plant license, in regard to a terrorist attack, are not significant. The comment provides no new and significant information; therefore no changes were made in the SEIS in response to this comment.*

The following comments assert that the SAMA analysis in the draft SEIS is incomplete because it did not consider the contribution to severe accident costs from a fire in either of the SFPs at Indian Point. No SAMAs that would avoid or mitigate such costs have been identified. If the costs of SFP fires were considered, the value of SAMAs would be significant.

102-I-NE/OE/PA, 128-r-SM/UF, 140-cc-SM, 147-b-NE/OE/PA, and 174-e-NE/OE/PA

Response: *The objective of the SAMA evaluation is to identify and evaluate potential plant improvements that provide the greatest level of risk reduction in a cost-beneficial manner. The focus of SAMA evaluations is on reactor accidents because reactor accidents account for the majority of the severe accident risk for a nuclear power plant facility. Previous studies show that the risk associated with spent fuel pool accidents and dry cask storage accidents is considerably less than that for reactor accidents (e.g., NUREG-1738 and NUREG-1864). Given that a spent fuel pool accident risk is considerably less than that for a reactor accident, a SAMA that addresses spent fuel accidents would not be expected to have a significant impact on total risk for the site. Additional mitigation strategies implemented subsequent to September 11, 2001 further reduce the risk from SFP fires by enhancing spent fuel coolability and the ability to recover SFP water level and cooling prior to a potential SFP fire, and make it even more unlikely that additional SFP safety enhancements could substantially reduce risk or be cost-beneficial. Further, as the Commission recently observed in the Pilgrim license renewal proceeding, the GEIS determined that the impacts of onsite spent fuel storage, including spent fuel pool accidents, are "small" and constitute a Category 1 issue for which site-specific consideration in a license renewal proceeding is not required (CLI-10-14). The comments provide no new and significant information; therefore no changes were made in the SEIS in response to this comment.*

The following comment asserts that the SAMA analysis in the draft SEIS underestimates the potential for containment bypass during a core-damage accident. In light of current knowledge about severe reactor accidents, it is prudent to assume that all accident sequences that proceed to core damage with a dry secondary side and at high reactor coolant system pressure would result in induced failure of steam generator tubes, and that one or more of the secondary side safety valves downstream of the affected steam generator(s) would remain open after tube failure. This would significantly increase the conditional probability of an Early High release from that used in the ER. If the economic benefit of averted containment bypass accidents were appropriately considered, a number of SAMAs rejected as too costly would be cost-effective.

140-dd-SM

Response: *The proposed assumptions are bounding in nature, and fail to acknowledge that only a portion of the accidents that proceed to core melt with high primary side pressure and a dry secondary side would be expected to result in an induced SGTR. In many sequences, other reactor coolant system (RCS) piping components are estimated to fail prior to (or very close to) the estimated time of SG tube rupture, thereby depressurizing the RCS and reducing the potential for an induced SGTR. Use of bounding assumptions is inconsistent with Commission policy on the use of PRA evaluations in support of regulatory decisions which states that such PRAs should be as realistic as practicable. Nevertheless, the impact of assuming a substantially higher probability of induced steam generator tube rupture was assessed as part of Entergy's SAMA evaluation. As described in Section G.6.2 of Appendix G of the SEIS, no additional cost beneficial SAMAs were identified as a result of this assessment. The comment provides no new and significant information; therefore no changes were made in the SEIS in response to this comment.*

The following comment asserts that the source term used to estimate the consequences of the most severe accidents with early containment failure was based on radionuclide release fractions generated by the MAAP code, and is smaller than that specified in NRC

guidance such as NUREG-1465, *Accident Source Terms for Light- Water Nuclear Power Plants* (1995) and the NRC's recent reevaluation for high-burnup fuel, ERI/NRC 02-202, *Accident Source Terms for Light-Water Nuclear Power Plants. High Burnup and MOX Fuels* (2002).

140-ee-SM

Response: *The source terms (radionuclide release fractions) described in the referenced documents were developed primarily to support reactor siting criteria wherein substantial meltdown into containment is postulated and the containment is assumed to leak at its maximum allowable leak rate. These source terms do not account for fission product removal, such as would occur if the release were into the containment (e.g., fission product removal by containment sprays), or if the release were the result of a SGTR event (e.g., fission product deposition within the primary system piping and within the steam generators). As such, use of the source terms proposed by the commenter represents a very conservative (non-realistic), essentially bounding estimate of releases to the environment for the "early high" release category. Use of bounding assumptions is inconsistent with Commission policy on the use of PRA evaluations in support of regulatory decisions which states that such PRAs should be as realistic as practicable. In fact, the radionuclide release fractions calculated by the MAAP code for SGTR events (which dominate the "early high" release category) are in generally good agreement with those calculated by NRC-sponsored codes, as indicated in the NRC staff's review of the Indian Point Individual Plant Examination. The comment provides no new and significant information; therefore no changes were made in the SEIS in response to this comment.*

The following comment asserts that the SAMA analysis significantly underestimated offsite costs resulting from a severe accident at Indian Point because it failed to adequately consider the uncertainties in its consequence calculations resulting from meteorological variations.

140-ff-SM

Response: *To account for potential uncertainties in the SAMA analysis, estimated benefits for each SAMA were increased by a multiplier of approximately 2 based on the ratio of the 95th percentile core damage frequency to the mean core damage frequency. The comment fails to recognize that: (1) there are additional conservatisms in other parts of the analysis, specifically, the risk reduction estimates and the cost estimates, (2) the SAMA analysis is a probabilistic assessment of a broad range of accident sequences, meteorological conditions and other pertinent factors rather than an assessment of one accident under a single set of meteorological conditions, and (3) combining the estimated uncertainties in each step of the SAMA evaluation would result in an over-estimate of the uncertainties, and could lead to inappropriate decisions regarding whether a SAMA would realistically be cost-beneficial. Consistent with the use of risk methods and uncertainties in other regulatory applications, the SAMA analysis is based on best estimate (mean value) risk estimates, but considers the potential impact of uncertainties on the results of the evaluation, i.e., whether additional SAMAs would be cost-beneficial given the uncertainties. Although on its surface a multiplier of about 2 may appear small relative to the uncertainties in other parts of the analysis, the staff considers the margin adequate to cover those uncertainties, since the risk reduction and cost estimates were evaluated in a conservative manner. The comment provides no new and significant information; therefore no changes were made in the SEIS in response to this comment.*

The following comment asserts that the SAMA analysis significantly underestimated offsite costs of a severe accident because it inappropriately used a $2,000/person-rem dose conversion factor. The $2,000/person-rem conversion factor is intended to represent the costs associated with stochastic health effects (i.e., fatal cancers, nonfatal cancers, and hereditary effects), and does not account for the costs associated with deterministic effects (i.e., early fatalities from acute radiation exposure). The total cost of latent cancer fatalities could also be higher because some members of the public will receive doses above the threshold level for application of a dose- and dose-rate reduction effectiveness factor. These deficiencies undervalue the offsite costs of severe accidents and the benefits of SAMAs that would mitigate the environmental impacts of severe accidents.

140-ff-SM

Response: *The NRC staff estimates that the costs associated with deterministic health effects would be less than 3 percent of the costs of stochastic health effects estimated using the $2000 per person-rem dose conversion. Thus, the inclusion of deterministic health effects, while consistent with the regulatory guidance in NUREG-1530, would have a negligible impact on the results of the SAMA analysis. The comment provides no new and significant information; therefore no changes were made in the SEIS in response to this comment.*

The following comment asserts that the NRC should be more vigilant in assessing cost measures and not engage in a pro forma, deferential analysis of the costs of safety design measures provided by the plant owner.

170-d-PA/SM

Response: *The NRC Staff did not engage in a pro forma, deferential analysis of the cost estimates provided by the licensee. Rather, the Staff reviewed the bases for the licensee's cost estimates and also compared the cost estimates to estimates developed elsewhere for similar improvements, including estimates developed as part of other licensees' SAMA analyses. Where Entergy's cost estimates appeared high, the Staff obtained additional information and justification for the values. The Staff concluded that the cost estimates provided by Entergy were reasonable and consistent with estimates provided in other license renewal applications. The comment provides no new and significant information; therefore no changes were made in the SEIS in response to this comment.*

The following comments assert that editorial corrections should be made in the FSEIS. The NRC Staff's review of the comments led the Staff to conclude that certain editorial corrections should be made to the FSEIS, and are indicated in the category "Editorial Comments – To Be Addressed in FSEIS" below. Other comments were rejected by the NRC Staff, as indicated in the category "Editorial Comments – Not applicable" below, where the comment was determined to be incorrect, insignificant, inconsistent, confusing, and/or adequately addressed elsewhere.

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SAMA Editorial Changes Incorporated in the SEIS:

Page 5-6, Table 5-3. The last entry for IP3 (loss of essential service water) should be 1.8×10^{-8} rather than 1.9×10^{-8}. [40-ww-ED/SM]

Page G-3, Table G-1. The last entry for IP3 (loss of essential service water) should be $1.8x10^{-8}$ rather than $1.9x10^{-8}$. [40-lll-ED/SM]

Page G-14, line 5-6. Parenthetical information indicates that gas turbine and AFW components are located in 'sheet metal clad structures'. It should list EDG components rather than AFW components. ER Section E.1.3.3.1 indicates that the high wind analysis resulted in proposal of an enhancement to upgrade the EDG building. [40-lll-ED/SM]

Page G-17, line 22-25. Change the text to read "The information was derived from Westinghouse Electric Company, Core Radiation Sources to Support IP2 Power Uprate Project, CN-REA-03-4 (3/7/2005), and Westinghouse Electric Company, Core Radiation Sources to Support IP3 Stretch Power Uprate (SPU) Project, CN-REA-03-40 (5/19/2005)". (See the response to RAI 4a in reference Entergy 2008A.) [40-lll-ED/SM]

Page G-21, line 32-34. Text states that a modification to replace the existing gas turbines with an IP2 SBO/Appendix R diesel is planned for the near future. In fact, installation of this diesel was made a condition of acceptance of the LRA for review. The diesel was installed and operational prior to 4/30/08. See Entergy letter NL-08-074, Indian Point, Units 2 and 3, Amendment 4 to License Renewal Application (LRA), April 30, 2008 (ML081280491). [40-lll-ED/SM]

Page G-32, line 31-33. The overall multiplier shown has been rounded to one decimal place for each unit: "(i.e. 3.8x2.1=8.0 for IP2 and 5.5xl.4=7.7 for IP3)". While not incorrect, this does create a slight apparent disconnect with the description, which states that the multiplier of 8 slightly exceeds the (actual calculated value). Suggest keeping the second decimal (as follows) to provide some clarification: "(i.e., 3.80x2.10=7.98 for IP2 and 5.53x1.40=7.73 for IP3)". [40-lll-ED/SM]

SAMA Editorial Changes Not Incorporated in the SEIS

Page 5-7, Table 5-4. The entries for In-vessel steam explosion for IP2 and IP3 are 1 and 0, respectively. This appears to be due to rounding up or down at 0.5%. However, this is not consistent with the treatment for Intact Containment and may lead to confusion since the percentages for IP2,no longer add up to 100%. Suggest that the percentage for In-vessel steam Explosion be shown as "<1" for both IP2 and IP3. [40-ww-ED/SM]

Page 5-7, Table 5-4. The total population dose for I P3 is 24.5 rather than 24.3. Suggest changing "22.0" and "24.3" to "22" and "24" for IP2 and IP3, respectively. [40-ww-ED/SM]

Page 5-8, Line 30-34. The DSEIS states that Entergy identified 5 potentially cost-beneficial SAMAs for IP2 in the baseline analysis and two additional potentially cost-beneficial SAMAs (44 and 56) when uncertainties are considered. ER Table 4-4 (page 4-74) indicates that SAMA 28 was not cost-beneficial without accounting for uncertainty. The FSEIS should state that Entergy identified 4 potentially cost-beneficial SAMAs for IP2 in the baseline analysis and three additional (28, 44, and 56) when uncertainties are considered. [40-ww-ED/SM]

Page 5-9, Line 11-14. See comment for pages 5-8, lines 30-34. For consistency with SAMAs 44 and 56, SAMA 28 should be annotated “(cost beneficial with uncertainties)”. [40-ww-ED/SM]

Page G-4, Table G-2. The entries for In-vessel steam explosion for IP2 and IP3 are 1 and 0, respectively. This appears to be due to rounding up or down at 0.5%. However, this is not

consistent with the treatment for Intact Containment and may lead to confusion since the percentages for IP2 no longer add up to 100%. Suggest that the percentage for In-vessel steam Explosion be shown as "<1" for both IP2 and IP3. [40-lll-ED/SM]

Page G-4, Table G-2. The total population dose for IP3 is 24.5 rather than 24.3. Suggest changing "22.0" and "24.3" to "22" and "24" for IP2 and IP3, respectively. [40-lll-ED/SM]

Page G-25, Table G-6. Change population dose risk reduction from "18" to "1' for IP2 SAMA 56. The value is 0.45 (see ER Table E.2-2). [40-lll-ED/SM]

Page G-25, Table G-6. Change population dose risk reduction from "20" to "40" for IP2 SAMA 65. The value is 40.45 (see ER Table E.2-2). [40-lll-ED/SM]

Page G-30, line 10-15. Text states that Entergy identified 5 potentially cost-beneficial SAMAs for IP2 in the baseline analysis and two additional (44 and 56) when uncertainties are considered. ER Table 4-4 (pg 4-74) indicates that SAMA 158 G-30 10-15 28 was not cost-beneficial without accounting for uncertainty. FSEIS should state that Entergy identified 4 potentially cost-beneficial SAMAs for IP2 in the baseline analysis and three additional (28, 44, and 56) when uncertainties are considered. [40-lll-ED/SM]

Page G-30, line 25-28. See comment #158 for page G-30, lines 10-15. For consistency with SAMAs 44 and 56, SAMA 28 should be annotated "(cost beneficial with uncertainties)". [40-lll-ED/SM]

A.2.11 Comments Concerning Uranium Fuel Cycle and Waste Management Issues

The following comments raise concerns about the long term storage of spent fuel in spent fuel pools and dry casks, and state that the risk is greater than described in the draft SEIS. Also, they generally assert that, because of radioactive waste leaks, there should be increased inspection of the sources of nuclear waste leakage and their effects on current and future human health:

9-c-LE/PA/RW; 11-e-RW/ST; 12-e-RW/ST; 17-r-EP/GI/RI; 20-a-PA/SF/ST; 38-g-RW; 47-c-RW; 61-a-LE/RW/ST; 63-b-RW; 72-a-EP/LE/OR/RW; 80-a-EP/OR/RW/ST; 80-b-LE/RW/SF/ST; 87-b-HH/PA/RW/ST; 91-e-OR/RW/ST; 106-a AE/LE/RW/SF; 123-e-RW/SF; 126-a-DE/RW/SF/ST

Response: *A generic assessment of the radiological and nonradiological environmental impacts of the uranium fuel cycle and transportation of nuclear fuel and wastes is contained in 10 CFR Part 51, Tables S-3 and S-4, respectively. 10 CFR Part 51.51(a) states in part, "Every environmental report prepared for the construction permit stage of a light-water-cooled nuclear power reactor, and submitted on or after September 4, 1979, shall take Table S-3, Table of Uranium Fuel Cycle Environmental Data, as the basis for evaluating the contribution of the environmental effects of uranium mining and milling, the production of uranium hexafluoride, isotopic enrichment, fuel fabrication, reprocessing of irradiated fuel, transportation of radioactive materials and management of low-level wastes and high-level wastes related to uranium fuel-cycle activities to the environmental costs of licensing the nuclear power reactor." The information, with the exception of Radon-222 (Rn-222), Technetium-99 (Tc-99), provides the basis for the environmental information provided by applicants and must be used at individual licensing proceedings for the construction of light-water reactors. The GEIS for license renewal*

supplements the data on environmental impacts of the uranium fuel cycle presented in Table S-3 and of transportation of radioactive wastes presented in Table S-4 to to extend the evaluation of impacts to Rn-222, Tc-99, higher fuel enrichment, higher fuel burnup, and license renewal for an additional 20 years of operation. The data in Table S-3 were developed to represent the worst case on bounding estimates of the potential releases from the uranium fuel cycle while still being in compliance with NRC regulatory limits. The GEIS for license renewal provides a review of regulatory requirements of the various stages of the fuel cycle, including detailed discussions of the on-site and off-site requirements. The storage and disposal of spent fuel, low-level radioactive waste, and mixed waste storage and the radiological and Nonradiological impacts to the environment are also discussed.

Based on the information contained in the GEIS for license renewal, the Commission concluded that the impacts from the uranium fuel cycle are SMALL except for the off-site radiological collective impacts from the fuel cycle and from high-level waste and spent fuel disposal, which the Commission concluded, are acceptable.

The NRC staff did not identify any new and significant information related to the uranium fuel cycle during its review of the IP2 and IP3 environmental report, the site audit, and the scoping process. Therefore, there are no impacts related to these issues beyond those discussed in the GEIS for license renewal.

The NRC ensures that nuclear power plants are operated safely within radiation protection requirements; the NRC does this by licensing the plants and the plant operators, and establishing license conditions for the safe operation of each plant. The NRC provides continuous oversight of plants through its Reactor Oversight Process (ROP) to verify that they are being operated in accordance with NRC regulations. The NRC has authority to take action to protect public health and safety and may demand immediate licensee actions, up to and including a plant shutdown. The NRC currently inspects existing radioactive waste handling and storage facilities at IPEC. Security issues for the facility and all radioactive material are also part of the ROP which the NRC provides continuous oversight.

The comments do not present any significant new information that would warrant a change to the final SEIS.

The following comment asserts that nuclear power has significant environmental impacts, specifically from uranium mining and discharges of radioactive effluents into the atmosphere and groundwater from nuclear power plants:

13-e-RW/UF

Response: *The comment is noted. The SEIS, in chapter 6, contains a discussion of the impacts from the uranium fuel cycle and greenhouse gas emissions. The SEIS, in chapters 2 and 4, contains an evaluation of the impacts to human health from radioactive emissions from IPEC. The Human Health and Leaks comment response sections also contain information on the impacts from radioactive effluents.*

The comment does not present any significant new information that would warrant a change to the final SEIS.

The following comments raise concerns about the safe transportation of radioactive waste in the public domain:

35-c-AM/RW; 84-a-RW

Response: *The transportation of radioactive waste is evaluated in chapter 6 of the SEIS and in chapter 6 of the GEIS for license renewal. The GEIS addresses both the radiological and nonradiological environmental impacts resulting from shipments of low-level radioactive waste (LLW) and mixed waste to off-site disposal facilities and of spent fuel to a monitored retrievable storage or permanent repository. The nonradiological impacts are traffic density, weight of the loaded truck or railcar, heat from the fuel cask, and transportation accidents. The radiological impacts include possible exposures of transport workers and the general public along transportation routes. Radiation exposure to these groups also may occur through accidents along transportation corridors.*

In addition, Table S-4 in 10 CFR Part 51 lists the environmental impacts of transportation of spent fuel and waste to and from a nuclear power reactor.

The environmental impacts from the transportation of fuel and waste attributable to license renewal were found to be small when they are within the range of impact parameters indentified in Table S-4. The estimated radiological effects are within NRC's regulatory standards. The nonradiological impacts are those from periodic shipments of fuel and waste by individual trucks or rail cars and thus would result in infrequent and localized minor contributions to traffic density.

The comments do not present any significant new information that would warrant a change to the final SEIS.

The following comments assert that radioactive waste pollutes the Hudson River and the local region, the region where it is disposed, and potentially areas through which it is transported.

38-b-PA/RW/ST; 38-f-RW/SF

Response: *All nuclear plants were licensed with the expectation that they would release some radioactive material to both the air and water during normal operation. NRC regulations require that radioactive gaseous and liquid releases from nuclear power plants meet radiation dose-based limits specified in 10 CFR Part 20, the "as low as is reasonably achievable" (ALARA) dose criteria in Appendix I to 10 CFR Part 50, and the EPA's regulations in 40 CFR Part 190. Regulatory limits are placed on the radiation dose that members of the public might receive from radioactive material released by nuclear plants. The NRC regulations are dose based, such that the dose resulting from the radioactive effluent is the value used by the NRC to determine compliance with regulatory limits. Nuclear power plants are required to report their radioactive gaseous, liquid, and solid effluent releases as well as the results of their radiological environmental monitoring program annually to the NRC. The annual effluent release and radiological environmental monitoring reports submitted to the NRC are available to the public through the ADAMS electronic reading room on the NRC website (www.NRC.gov).*

The NRC staff performed an evaluation of the impacts from radioactive effluents discharged into the environment in chapters 2 and 4 of the SEIS. As indicated, the staff reviewed the results of IPEC's radiological environmental monitoring program (REMP), which show that concentrations of radioactive contaminants in native leafy vegetation, soils and sediments, Hudson River surface water and fish from the vicinity of IPEC are very low (at or near the threshold of the survey instrument's detection capability) and seldom above background levels. Based on these data, the NRC staff concluded that no disproportionately high and adverse human health

impacts would be expected in special pathway receptor populations in the region as a result of subsistence consumption of fish and wildlife.

The issues of transportation of radioactive waste, radioactive pollution in the local area where it is generated and stored, and the impacts associated with its disposal are evaluated in chapter 6 of the dSEIS and in chapter 6 of the GEIS for license renewal. The GEIS addresses both the radiological and nonradiological environmental impacts resulting from shipments of low-level radioactive waste (LLW) and mixed waste to off-site disposal facilities and of spent fuel to a monitored retrievable storage or permanent repository. The nonradiological impacts are traffic density, weight of the loaded truck or railcar, heat from the fuel cask, and transportation accidents. The radiological impacts include possible exposures of transport workers and the general public along transportation routes. Radiation exposure to these groups also may occur through accidents along transportation corridors.

In addition, Table S-4 in 10 CFR Part 51 lists the environmental impacts of transportation of spent fuel and waste to and from a nuclear power reactor.

The environmental impacts from the transportation of fuel and waste attributable to license renewal are found to be small when they are within the range of impact parameters indentified in Table S-4. The estimated radiological effects are within NRC's regulatory standards. The Nonradiological impacts are those from periodic shipments of fuel and waste by individual trucks or rail cars and thus would result in infrequent and localized minor contributions to traffic density.

The issue of radioactive leaks is addressed in chapter 2 and 4 of the dSEIS and in the Human Health and Leaks comment response sections.

The comment does not present any significant new information or arguments that would warrant a change to the final SEIS.

The following comments assert that radioactive waste was used to make weapons used in Iraq that cause more damage to homes and people than regular weapons:

38-c-RW/SF/ST; 38-e-RW/SF; 38-f-RW/SF

Response: *The comment appears to relate to the use of depleted uranium used for military applications. Radioactive waste from commercial nuclear power plants licensed by the NRC is not used to make weapons. The NRC requires its licensees to maintain strict control over the use, storage, transportation, and disposal of radioactive material and waste. Spent nuclear fuel is stored at the reactor site under strict controls for its safety and security in accordance with NRC regulations.*

The comments are out of scope and do not present any significant new information that would warrant a change to the final SEIS.

The following comment raises concerns about the cost of storing radioactive wastes :

39-a-RW/SF

Response: *The regulatory authority over licensee economics (including the need for power) falls within the jurisdiction of the states and, to some extent, within the jurisdiction of the Federal Energy Regulatory Commission. It should be noted that the President's Council on Environmental Quality (CEQ) regulations interpret NEPA to require an assessment of the*

cumulative effects of a proposed Federal action on the natural and man-made environment and indicate that the determination of the need for generating capacity is the states' responsibility.

The NRC, in accordance with 10 CFR 51.53(c)(2), does not require the licensee to address the need for power or the economic costs and economic benefits of the license renewal or of alternatives to the proposed action, except insofar as such costs and benefits are either essential for a determination regarding the inclusion of an alternative in the range of alternatives considered or are relevant to mitigation. An evaluation of the economic costs associated with IPEC's storage of radioactive waste and of the leaks of radioactive material is outside the scope of the license renewal review.

The impacts related to the leaks of radioactive material are evaluated in chapters 2 and 6 of the SEIS and in the Human Health and Leaks comment response sections.

The comment does not present any significant new information that would warrant a change to the final SEIS.

The following comments indicate that the GEIS does not adequately evaluate the long term impacts and safety of the generation and long-term storage of radioactive waste:

50-n-RW/SF; 96-j-LR/PA/RW; 38-g-RW; 38-i-RW; 47-c-RW

Response: *The GEIS for license renewal contains a complete and thorough evaluation of the uranium fuel cycle and solid waste management. The NRC is conducting a rulemaking, including public notice and consideration of public comments, to codify the conclusions of the GEIS in Table B–1 of Appendix B to 10 CFR Part 51.*

Additionally, the NRC's Waste Confidence Rule, found in 10 CFR 51.23, states that "the Commission has made a generic determination that, if necessary, spent fuel generated in any reactor can be stored safely and without significant environmental impacts for at least 30 years beyond the licensed life for operation (which may include the term of a revised or renewed license) of that reactor at its spent fuel storage basin or at either onsite or offsite independent spent fuel storage installation. Further, the Commission believes there is reasonable assurance that at least one mined geologic repository will be available within the first quarter of the twenty-first century, and sufficient repository capacity will be available within 30 years beyond the licensed life for operation of any reactor to dispose of the commercial high-level waste and spent fuel originating in such reactor and generated up to that time." While the Commission has initiated a rule making proceeding regarding the Waste Confidence Rule, the rule remains in effect at this time.

Accordingly, no discussion of the environmental impact of spent fuel storage in reactor facility storage pools or independent spent fuel storage installation is required for an environmental impact statement associated with license renewal.

The NRC has considered and addressed the issue; the comments do not present any significant new information that would warrant a change to the final SEIS or to the GEIS for license renewal.

The following comments assert that nuclear waste is accumulating without possible future disposal. License renewal lengthens this storage period. As a result, the SEIS should evaluate the case where Indian Point's spent fuel is permanently stored at the site:

38-c-RW/SF/ST; 38-f-RW/SF; 38-g-RW; 47-a-SF; 47-b-LE/EP/SF; 54-a-LE/OR/RW/SF; 71-c-LE/RW; 84-a-RW; 102-c-RW/SF; 102-k-RW; 103-b-RW/SF

Response: *As discussed above, the NRC's Waste Confidence Rule, found in 10 CFR 51.23, states that "the Commission has made a generic determination that, if necessary, spent fuel generated in any reactor can be stored safely and without significant environmental impacts for at least 30 years beyond the licensed life for operation (which may include the term of a revised or renewed license) of that reactor at its spent fuel storage basin or at either onsite or offsite independent spent fuel storage installation. Further, the Commission believes there is reasonable assurance that at least one mined geologic repository will be available within the first quarter of the twenty-first century, and sufficient repository capacity will be available within 30 years beyond the licensed life for operation of any reactor to dispose of the commercial high-level waste and spent fuel originating in such reactor and generated up to that time."*

Accordingly, no discussion of any environmental impact of spent fuel storage in reactor facility storage pools or independent spent fuel storage installation is required for an environmental impact statement associated with license renewal.

The comments are out of scope and do not present any significant new information or arguments that would warrant a change to the final SEIS.

The following comments assert that the final SEIS should contain specific information (i.e. location, shielding, storage duration, and security) on IP's plan for the storage of low-level radioactive waste:

55-c-RW; 129-c-RW; 137-g-NE/RW

Response: *Issues regarding storage of low-level radioactive waste are outside of the scope of the environmental review process for license renewal. The NRC has determined that the environmental impacts related to the storage of low-level radioactive waste, as set forth in NUREG–1437 and in Table B–1 of Appendix B to 10 CFR Part 51, are small. That finding is based on the comprehensive regulatory controls that are in place and the low public doses being achieved at all power reactors. The NRC staff included a brief discussion of IPEC's plan for low-level radioactive waste due to the closure of the Barnwell, South Carolina facility to states outside of the Atlantic compact. The NRC ensures that nuclear power plants are operated safely within radiation protection requirements; the NRC does this by licensing the plants and the plant operators, and establishing license conditions for the safe operation of each plant. The NRC provides continuous oversight of plants through its Reactor Oversight Process (ROP) to verify that they are being operated in accordance with NRC regulations. The NRC has authority to take action to protect public health and safety and may demand immediate licensee actions, up to and including a plant shutdown. The NRC currently inspects existing radioactive waste handling and storage facilities at IPEC. Security issues for the facility and all radioactive material are also part of the ROP which the NRC provides continuous oversight. Any future facility used for the storage of radioactive waste will be inspected in accordance with the ROP to ensure that the radiation doses to plant workers and members of the public are within regulatory limits.*

The comment does not present any significant new information that would warrant a change to the final SEIS.

The following comment asserts that radioactive material has been lost at some nuclear power plants because they do not have an adequate accountability measures for high-level radioactive wastes stored in the spent fuel pools:

63-f-RW/ST

Response: *The comment is noted. The issue is not unique to license renewal; it is a current operating issue that is addressed through the NRC's inspection program. Radioactive material accountability issues are periodically reviewed by NRC inspectors for compliance with NRC requirements. The reviews continue throughout the term of the operating license, whether the original or renewed license. If issues related to radioactive material accountability are discovered at a nuclear plant, they are addressed immediately, and any necessary changes are incorporated under the operating license.*

The comment does not present any significant new information that would warrant a change to the final SEIS.

The following comments assert that used fuel is a resource that can be used in future generations through recycling, as is done in other countries:

71-d-RW; 120-h-OP/RW

Response: *The comment raises a generic national policy issue that is outside the scope of the environmental review for license renewal and the NRC's regulatory authority under the Atomic Energy Act of 1954, as amended.*

The comment does not present any significant new information that would warrant a change to the final SEIS.

The following comments assert that storage of spent fuel in storage pools and dry casks at Indian Point are very robust and are not vulnerable from natural events and terrorist attack:

79-j-HH; 120-m-RW/SF

Response: *The comment is noted. The comment does not present any significant new information that would warrant a change to the final SEIS.*

The following comment asserts that if Indian Point shuts down, spent fuel could be left unmonitored onsite until decommissioning:

124-a-AL/RW/SF

Response: *The NRC staff does not agree with the comment. Although the comment is outside the scope of the environmental review, the NRC staff notes that any spent fuel stored at the site after the plant is shutdown will be controlled in a safe and secure manner.*

NRC regulations require that spent nuclear fuel be stored and maintained in a safe and secure manner while the plant is operating and after the plant operating license expires. The spent fuel remains under the direct control of the licensee and the regulatory oversight of the NRC until its ultimate disposition.

The comment does not present any significant new information that would warrant a change to the final SEIS.

The following comments assert that the basis for the impacts of the uranium fuel cycle are out of date and need to be revised:

50-u-GL/UF; 123-d-GE/SF

Response: *The NRC committed to review and revise the GEIS for license renewal on a 10-year cycle, if necessary. In July 2009, the NRC staff issued a draft for public comment of revision 1 to the GEIS. Since publication of the 1996 GEIS, over 30 plant sites (50 reactor units) have applied for license renewal and undergone environmental reviews, the results of which were published as supplements to the 1996 GEIS. The revised GEIS will include a review and reevaluation of the technical issues and findings of the 1996 GEIS. It will incorporate lessons learned and knowledge gained during previous license renewal reviews. In addition, new research, findings, and other information will be considered in evaluating the significance of impacts associated with license renewal. Nevertheless, the draft revision has not been adopted; the 1986 GEIS is still applicable. Section 4.12.1 of the draft GEIS contains the environmental consequences of the uranium fuel cycle.*

The comments do not present any significant new information that would warrant a change to the final SEIS.

The following comments assert that the NRC inadequately evaluated negative impacts of uranium mining, fuel fabrication, and storage of waste on communities, including low income and minority populations' water resources and health:

51-a-HH/PA/UF; 70-b-UF; 79-y-EJ/UF; 164-h-UF

Response: *A generic assessment of the radiological and nonradiological environmental impacts of the uranium fuel cycle and transportation of nuclear fuel and wastes is contained in 10 CFR Part 51, Tables S-3 and S-4, respectively. 10 CFR Part 51.51(a) states in part, "Every environmental report prepared for the construction permit stage of a light-water-cooled nuclear power reactor, and submitted on or after September 4, 1979, shall take Table S-3, Table of Uranium Fuel Cycle Environmental Data, as the basis for evaluating the contribution of the environmental effects of uranium mining and milling, the production of uranium hexafluoride, isotopic enrichment, fuel fabrication, reprocessing of irradiated fuel, transportation of radioactive materials and management of low-level wastes and high-level wastes related to uranium fuel-cycle activities to the environmental costs of licensing the nuclear power reactor." The information, with the exception of Radon-222 (Rn-222), Technetium-99 (Tc-99), provides the basis for the environmental information provided by applicants and must be used at individual licensing proceedings for the construction of light-water reactors. The GEIS for license renewal supplements the data on environmental impacts of the uranium fuel cycle presented in Table S-3 and of transportation of radioactive wastes presented in Table S-4 to extend the evaluation of impacts to Rn-222, Tc-99, higher fuel enrichment, higher fuel burnup, and license renewal for an additional 20 years of operation. The data in Table S-3 were developed to represent the worst case on bounding estimates of the potential releases from the uranium fuel cycle while still being in compliance with NRC regulatory limits. The GEIS for license renewal provides a review of regulatory requirements of the various stages of the fuel cycle, including detailed discussions of the on-site and off-site requirements. The storage and disposal of spent fuel, low-level radioactive waste, and mixed waste storage and the radiological and Nonradiological impacts to the environment are also discussed.*

Based on the information contained in the GEIS for license renewal, the Commission concluded that the impacts from the uranium fuel cycle are SMALL except for the off-site radiological collective impacts from the fuel cycle and from high-level waste and spent fuel disposal, which the Commission concluded, are acceptable.

The NRC staff did not identify any new and significant information related to the uranium fuel cycle during its review of the IP2 and IP3 environmental report, the site audit, and the scoping process. Therefore, there are no impacts related to these issues beyond those discussed in the GEIS for license renewal.

The comments do not present any significant new information that would warrant a change to the final SEIS.

The following comments assert that greenhouse gases attributable to the mining of uranium, its manufacture in to fuel, and use at Indian Point needs to be fully disclosed in the SEIS:

81-a-UF; 96-i-EJ/UF; 103-a-AL/UE

Response: *The issue of greenhouse gases (GHG) is discussed in chapter 6 of the SEIS. The NRC staff concluded that estimating the GHG emissions associated with current nuclear energy sources is challenging because of differing assumptions and noncomparable analyses performed by the various authors. The differences and complexities in these assumptions and analyses increase when using them to project future GHG emissions. However the NRC staff was able to draw some conclusions.*

(1) The current estimates of GHG emissions from the nuclear fuel cycle are far below those for fossil-fuel-based energy sources.

(2) IP2 and IP3 license will involve continued uranium mining, processing, and enrichment, but will not result in increased GHG emissions associated with plant construction or decommissioning (as the plant will have to be decommissioned at some point whether the license is renewed or not).

(3) Few studies predict that nuclear fuel cycle emissions will exceed those of fossil fuels within a timeframe that includes the IP2 and IP3 periods of extended operation. Several studies suggest that future extraction and enrichment methods, the potential for higher grade resource discovery, and technology improvements could extend this timeframe.

The comment does not present any significant new information or arguments that would warrant a change to the final SEIS.

A.2.12 Comments Concerning Radiological Impacts

The following comment questioned GEIS statements that the radiological impacts from license renewal are SMALL. An article in the Wall Street Journal about a drop in power demand that worries utilities, and an article in TIME magazine about increased energy efficiency:

2-a-AL/RI

Response: *The comment is noted. The comment appears to relate to the need for power from IP2 and IP3; that issue is beyond the scope of license renewal and of the NRC's regulatory authority. The comment does not present any significant new information that would warrant a change to the final SEIS.*

The following comment asserts that Entergy's radiological environmental monitoring program should include the testing of lichen as an indicator of radioactive contamination:

93-b-RI/TE

Response: *IPEC conducts a radiological environmental monitoring program (REMP) in which radiological impacts to the environment and the public around the IPEC site are monitored, documented, and compared to NRC standards. Entergy summarizes the results of its REMP in an Annual Radiological Environmental Operating Report. The reports are publicly available on the NRC's public website. The purpose of IPEC's REMP is to enable the identification and quantification of changes in the radioactivity of the area and to measure radionuclide concentrations in the environment attributable to operations at the IPEC site.*

The REMP samples environmental media in the environs around the site to analyze and measure the radioactivity levels that may be present. The media samples are representative of the radiation exposure pathways to the public from plant radioactive effluents. The REMP measures direct radiation and airborne, and waterborne pathways for radioactivity in the vicinity of the IPEC site. Direct radiation pathways include radiation from buildings and plant structures and airborne material that may be released from the plant. In addition, the REMP also measures background radiation (i.e., cosmic sources, naturally occurring radioactive material, including radon and global fallout). Thermoluminescent dosimeters (TLDs) are used to measure direct radiation. The airborne pathway includes measurements of air, precipitation, drinking water, and broad leaf vegetation samples. The waterborne pathway consists of measurements of Hudson River surface water, fish and invertebrates, aquatic vegetation, bottom sediment, and shoreline soil.

The results of the REMP are intended to supplement the results of the radiological effluent monitoring program by verifying that the measurable concentrations of radioactive material and levels of radiation are not higher than expected on the basis of the effluent measurements and modeling of the environmental exposure pathways. The two programs work together as a check against each other.

The REMP provides measurements of radiation and of radioactive materials in those exposure pathways and for those radionuclides which lead to the highest potential radiation exposure to members of the public. It does not require that every type of environmental media or biota in the area be sampled and analyzed. The NRC requires that only commercially or recreationally important species in the vicinity of the discharge point be sampled and analyzed. Other biota, such as lichen, which may be present in the area, do not represent a significant dose pathway to humans and are not required to be part of the REMP.

The radiological effluent monitoring and environmental monitoring programs are part of the NRC's Reactor Oversight Process inspection program for every nuclear power plant to ensure compliance with regulatory requirements. For license renewal, the NRC staff reviewed these programs and found them to be acceptable. The Staff's evaluation can be found in Chapters 2 and 4 of the final SEIS.

The NRC has considered and addressed this issue in the SEIS. The comment does not present any significant new information that would warrant a change to the final SEIS.

The following comments assert that the draft SEIS does not adequately discuss the long term health impacts from radioactive emissions and from radionuclides leaking into the environment:

96-d-HH/LE/RI; 98-c-HH/LE/RI; 117-a-AM/LE; 117-b-AM/LE; 126-d-LE/RI

Response: *The issue of radioactive leaks from IPEC was addressed in chapters 2 and 4 of the SEIS and in the Human Health and Leaks comment resolution sections.*

The NRC has considered and addressed these issues in the SEIS. The comments do not present any significant new information that would warrant a change to the final SEIS.

The following comment asserts that the EIS does not evaluate the synergistic impacts of radioactive effluents and chemical toxins such as PCBs and mercury:

102-h-HH/RI; 174-a-HH/RI; 174-c-HH; 180-e-HH/LE/RI

Response: *The NRC's primary mission is the safe regulation of commercial uses of nuclear materials, and to protect the public health and safety and the environment from the effects of radiation from nuclear reactors, materials, and waste facilities. The NRC's regulatory limits for radiological protection are set to protect workers and the public from the harmful health effects of radiation on humans. The limits are based on the recommendations of standards-setting organizations. Radiation standards reflect extensive scientific study by national and international organizations. The NRC actively participates and monitors the work of these organizations to keep current on the latest trends in radiation protection.*

Federal regulatory agencies, such as the U.S. Environmental Protection Agency regulate hazardous materials that are released into the air, water, and land. Additionally, individual State regulatory agencies regulate non-radioactive materials and from industrial facilities.

The combination of radiological and non-radiological controls in place at IPEC ensures that the public and the environment are adequately protected. If the NRC, EPA, or State agency determines that there is a need to revise its regulations to protect the public, facility workers, or the environment, the agency will initiate a rulemaking. The assessment models used by federal and state agencies to assess an impact typically use conservative assumptions and are based on data obtained from actual effluent waste streams or directly from the environment to develop a protection standard or limit.

The comment does not present any significant new information or arguments that would warrant a change to the final SEIS.

A.2.13 Comments Concerning Spent Fuel

The comment states that spent fuel storage, disposal and groundwater contamination must conform to state standards and should not impact coastal uses, users, and resources:

4-c-LR/SF

Response: *The State of New York, not the NRC, is responsible for coastal zone management and for assuring that coastal zone management issues are properly addressed. The NRC is responsible for protecting the public health and safety and the environment from the radiological impacts of IP2 and IP3 operation. Nevertheless, the NRC's process for the license renewal of nuclear power facilities includes substantial involvement and cooperation with state and local government agencies. These requirements are contained in 10 CFR 51.71(d), which states:*

"Consideration will be given to compliance with environmental quality standards and requirements that have been imposed by Federal, State, regional, and local agencies having responsibility for environmental protection, including applicable zoning and land-use regulations and water pollution limitations or requirements issued or imposed under the Federal Water Pollution Control Act. The environmental impact of the proposed action will be considered in the analysis with respect to matters covered by environmental quality standards and requirements irrespective of whether a certification or license from the appropriate authority has been obtained. While satisfaction of Commission standards and criteria pertaining to radiological effects will be necessary to meet the licensing requirements of the Atomic Energy Act, the analysis will, for the purposes of NEPA, consider the radiological effects of the proposed action and alternatives."

The comment does not present any significant new information that would warrant a change to the final SEIS.

The following comments raise concerns about the long term impacts from the storage of spent fuel in spent fuel pools and dry casks, especially with regard to terrorist attacks and the U.S. Department of Energy's failure to open a disposal site that is sized to accommodate all the spent fuel expected to be generated. In addition, the comments assert that the SEIS should evaluate the impacts of a fire, accident, or attack on the spent fuel:

13-c-PA/SF/ST; 13-d-PA/SF; 17-a-NE/SF; 17-p-EP/PA/RI; 17-h-SF; 17-i-SF/ST; 17-k-SF/ST; 20-a-PA/SF/ST; 27-e-SF/ST; 37-b-LE/SF/ST; 41-b-AM/SF; 44-b-AM/DE/SF; 50-n-RW/SF; 79-k-SF; 80-a-EP/OR/RW/ST; 80-b-LE/RW/SF/ST; 89-a-HH/PA/SF; 103-b-RW/SF; 106-a-AE/LE/RW/SF; 117-c-OR/SF; 123-d-GE/SF; 123-e-RW/SF; 126-a-DE/RW/SF/ST; 128-r-SM/SF/ST; 129-b-UF; 140-gg-UF; 162-e-AM/RW; 162-a-OR/RW; 174-b-RI; 178-LE/OR/RW; 180-f-RW; 17-p-EP/PA/RI;

Response: *A generic assessment of the radiological and nonradiological environmental impacts of the uranium fuel cycle and transportation of nuclear fuel and wastes is contained in 10 CFR Part 51, Tables S-3 and S-4, respectively. 10 CFR Part 51.51(a) states in part, "Every environmental report prepared for the construction permit stage of a light-water-cooled nuclear power reactor, and submitted on or after September 4, 1979, shall take Table S-3, Table of Uranium Fuel Cycle Environmental Data, as the basis for evaluating the contribution of the environmental effects of uranium mining and milling, the production of uranium hexafluoride, isotopic enrichment, fuel fabrication, reprocessing of irradiated fuel, transportation of radioactive materials and management of low-level wastes and high-level wastes related to uranium fuel-cycle activities to the environmental costs of licensing the nuclear power reactor." The information, with the exception of Radon-222 (Rn-222), Technetium-99 (Tc-99), provides the basis for the environmental information provided by applicants and must be used at individual licensing proceedings for the construction of light-water reactors. The GEIS for license renewal supplements the data on environmental impacts of the uranium fuel cycle presented in Table S-3 and of transportation of radioactive wastes presented in Table S-4 to extend the evaluation of*

impacts to Rn-222, Tc-99, higher fuel enrichment, higher fuel burnup, and license renewal for an additional 20 years of operation. The data in Table S-3 were developed to represent the worst case on bounding estimates of the potential releases from the uranium fuel cycle while still being in compliance with NRC regulatory limits. The GEIS for license renewal provides a review of regulatory requirements of the various stages of the fuel cycle, including detailed discussions of the on-site and off-site requirements. The storage and disposal of spent fuel, low-level radioactive waste, and mixed waste storage and the radiological and Nonradiological impacts to the environment are also discussed.

Based on the information contained in the GEIS for license renewal, the Commission concluded that the impacts from the uranium fuel cycle are SMALL except for the off-site radiological collective impacts from the fuel cycle and from high-level waste and spent fuel disposal, which the Commission concluded, are acceptable.

The NRC staff did not identify any new and significant information related to the uranium fuel cycle during its review of the IP2 and IP3 environmental report, the site audit, and the scoping process. Therefore, there are no impacts related to these issues beyond those discussed in the GEIS for license renewal.

The NRC ensures that nuclear power plants are operated safely within radiation protection requirements; the NRC does this by licensing the plants and the plant operators, and establishing license conditions for the safe operation of each plant. The NRC provides continuous oversight of plants through its Reactor Oversight Process (ROP) to verify that they are being operated in accordance with NRC regulations. The NRC has authority to take action to protect public health and safety and may demand immediate licensee actions, up to and including a plant shutdown.

In regard to the frequency of malevolent acts, the NRC has determined that security and mitigation measures the NRC has imposed upon its licensees since 9/11, coupled with national anti-terrorist measures and the robust nature of reactor containments and spent fuel pools, make the probability of a successful terrorist attack, though numerically indeterminate, very low.

The security-related measures and other mitigation measures implemented since 9/11 include actions that would improve the likelihood of identifying/thwarting the attack before it is initiated, mitigating the attack before it results in damage to the plant, and mitigating the impact of the plant damage such that reactor core damage or a spent fuel pool fire is avoided. Given the implementation of additional security enhancements and mitigation strategies, as well as further consideration of the factors identified above, the NRC staff concludes that the frequency of large radionuclide releases due to malevolent acts is very low. In addition, the NRC currently inspects existing radioactive waste handling and storage facilities at IPEC. Security issues for the facility and all radioactive material are also part of the ROP which the NRC provides continuous oversight.

Regarding the long term storage and ultimate disposition of spent nuclear fuel, the NRC's Waste Confidence Rule, found in 10 CFR 51.23, states that "the Commission has made a generic determination that, if necessary, spent fuel generated in any reactor can be stored safely and without significant environmental impacts for at least 30 years beyond the licensed life for operation (which may include the term of a revised or renewed license) of that reactor at its spent fuel storage basin or at either onsite or offsite independent spent fuel storage installation. Further, the Commission believes there is reasonable assurance that at least one mined geologic repository will be available within the first quarter of the twenty-first century, and

sufficient repository capacity will be available within 30 years beyond the licensed life for operation of any reactor to dispose of the commercial high-level waste and spent fuel originating in such reactor and generated up to that time."

Accordingly, no discussion of any environmental impact of spent fuel storage in reactor facility storage pools or independent spent fuel storage installation is required for an environmental impact statement associated with license renewal.

The comments do not present any significant new information that would warrant a change to the final SEIS.

The following comment indicates that storage of spent fuel in dry casks, while safer than spent fuel pool storage, will not reduce the amount of spent fuel in the pools.

17-j-SF

Response: *The comment is noted.*

Regardless of the final quantity of spent nuclear fuel generated during the operation of a nuclear power plant, the NRC's Waste Confidence Rule, found in 10 CFR 51.23, states that "the Commission has made a generic determination that, if necessary, spent fuel generated in any reactor can be stored safely and without significant environmental impacts for at least 30 years beyond the licensed life for operation (which may include the term of a revised or renewed license) of that reactor at its spent fuel storage basin or at either onsite or offsite independent spent fuel storage installation. Further, the Commission believes there is reasonable assurance that at least one mined geologic repository will be available within the first quarter of the twenty-first century, and sufficient repository capacity will be available within 30 years beyond the licensed life for operation of any reactor to dispose of the commercial high-level waste and spent fuel originating in such reactor and generated up to that time."The comment does not present any significant new information that would warrant a change to the final SEIS.

The following comment asserts that the National Academy of Sciences supports the need for an evaluation of the potential impacts from a terrorist attack:

17-l-SF/ST

Response*: The comment is noted. The NRC and other Federal agencies have heightened vigilance and implemented initiatives to evaluate and respond to possible threats posed by terrorists, including the use of aircraft against commercial nuclear power facilities and independent spent fuel storage installations.*

In regard to the frequency of malevolent acts, the NRC has determined that security and mitigation measures the NRC has imposed upon its licensees since 9/11, coupled with national anti-terrorist measures and the robust nature of reactor containments and spent fuel pools, make the probability of a successful terrorist attack, though numerically indeterminate, very low.

The security-related measures and other mitigation measures implemented since 9/11 include actions that would improve the likelihood of identifying/thwarting the attack before it is initiated, mitigating the attack before it results in damage to the plant, and mitigating the impact of the plant damage such that reactor core damage or a spent fuel pool fire is avoided. Given the implementation of additional security enhancements and mitigation strategies, as well as further consideration of the factors identified above, the NRC staff concludes that the frequency of large

radionuclide releases due to malevolent acts is very low. In addition, the NRC currently inspects existing radioactive waste handling and storage facilities at IPEC. Security issues for the facility and all radioactive material are also part of the ROP which the NRC provides continuous oversight. The NRC will continue to assess security-related measures and other mitigation measures that may be needed to assure adequate protection of the licensed facility. In the Pilgrim license renewal proceeding, the Commission affirmed that the National Environmental Policy Act (NEPA) imposes no legal duty to consider malevolent acts in conjunction with license renewal (CLI-10-14). The comment does not present any significant new information that would warrant a change to the final SEIS.

The following comment indicates that the storage of nuclear waste is not good for humans and the environment:

21-a-AE/OR/SF

Response: The comment is noted. The comment does not present any significant new information that would warrant a change to the final SEIS.

The following comments indicate that the Iraqi people were killed by nuclear waste-tipped warheads and continue to be impacted by the fallout from the weapons:

38-e-RW/SF; 38-f-RW/SF

***Response**: The comment appears to relate to the use of depleted uranium used for military applications. Radioactive material and waste from commercial nuclear power plants licensed by the NRC is not used to make weapons. The NRC requires its licensees to maintain strict control over the use, storage, transportation, and disposal of radioactive material and waste. Spent nuclear fuel is stored at the reactor site under strict controls for its safety and security in accordance with NRC regulations.*

The comments are out of scope and do not present any significant new information that would warrant a change to the final SEIS.

The following comment asserts that radioactive waste is going to last a long time at potentially great cost:

39-a-RW/SF

***Response**: The regulatory authority over licensee economics (including the need for power) falls within the jurisdiction of the states and, to some extent, within the jurisdiction of the Federal Energy Regulatory Commission. It should be noted that the President's Council on Environmental Quality (CEQ) regulations interpret NEPA to require an assessment of the cumulative effects of a proposed Federal action on the natural and man-made environment and indicate that the determination of the need for generating capacity is the states' responsibility.*

The NRC, in accordance with 10 CFR 51.53(c)(2), does not require the licensee to address the need for power or the economic costs and economic benefits of the license renewal or of alternatives to the proposed action, except insofar as such costs and benefits are either essential for a determination regarding the inclusion of an alternative in the range of alternatives considered or are relevant to mitigation. An evaluation of the economic costs associated with IPEC's storage of radioactive waste and of the leaks of radioactive material is outside the scope of the license renewal review.

The impacts related to the leaks of radioactive material are evaluated in chapters 2 and 6 of the SEIS and in the Human Health and Leaks comment response sections.

The comment does not present any significant new information that would warrant a change to the final SEIS.

The following comment indicates that Yucca Mountain is no longer a viable option for the disposal of IP's spent fuel. Consideration should be given to evaluating the use of monitored retrievable storage in the NRC's GEIS on License Renewal as well as for IP:

50-g-GE/SF

Response: *The comment is on an issue that is beyond the scope of license renewal and of the NRC's regulatory authority. The U.S. Department of Energy (DOE) is responsible for the preparation of an environmental impact statement for a storage or disposal facility for spent nuclear fuel. The NRC is responsible to evaluate the safety issues associated with the method of storage/disposal repository proposed by the DOE. The NRC's evaluation will determine the suitability of the proposed method for a license. However, regarding the long term storage or monitored retrievable storage and ultimate disposition of spent nuclear fuel, the NRC's Waste Confidence Rule, found in 10 CFR 51.23, states that "the Commission has made a generic determination that, if necessary, spent fuel generated in any reactor can be stored safely and without significant environmental impacts for at least 30 years beyond the licensed life for operation (which may include the term of a revised or renewed license) of that reactor at its spent fuel storage basin or at either onsite or offsite independent spent fuel storage installation. Further, the Commission believes there is reasonable assurance that at least one mined geologic repository will be available within the first quarter of the twenty-first century, and sufficient repository capacity will be available within 30 years beyond the licensed life for operation of any reactor to dispose of the commercial high-level waste and spent fuel originating in such reactor and generated up to that time."*

Accordingly, no discussion of any environmental impact of spent fuel storage in reactor facility storage pools or independent spent fuel storage installation is required for an environmental impact statement associated with license renewal.

The comments do not present any significant new information that would warrant a change to the final SEIS.

The following comment asserts that the SEIS should evaluate the case where Indian Point's spent fuel is permanently stored at the site:

102-c-RW/SF

Response: *The NRC addressed similar comments related to the issues associated with spent fuel in the Uranium Fuel Cycle and Waste Management and Spent fuel comment response sections.*

The following comment asserts that storage of spent fuel in storage pools and dry casks at Indian point are not vulnerable to natural events and terrorist attack:

120-m-RW/SF

Response: *The comment is noted. The NRC addressed comments related to the issues associated with spent fuel in the Uranium Fuel Cycle and Waste Management and Spent fuel comment response sections.*

The comment does not present any significant new information that would warrant a change to the final SEIS.

The following comment asserts that spent fuel would be left onsite for 60 years, unmonitored, until the facility is decommissioned:

124-a-AL/RW/SF

Response: *This comment was addressed in the Uranium Fuel Cycle and Waste Management and Spent fuel comment response sections.*

A.2.14 Comments Concerning Alternatives

The following comments are generally opposed to power alternatives due to environmental impacts, lack of proven feasibility or resource availability, or potential effects on electric rates:

34-a-AL/EC); 57-f-AL/AQ; 99-c-AL/EC; 9-h-AE/AL/AQ/HH; 14-c-AL/AQ; 14-d-AL/EJ/GL; 23-c-AL/AQ; 42-g-AL/AQ; 45-b-AL/EC/EJ; 49-g-AL/AQ/EJ; 52-c-AL/AQ/EJ; 52-d-AL; 56-a-AL/AQ/EC; 56-f-AL/SA; 58-b-AL/AQ/EJ; 67-d-AL; 90-c-AL/AQ/HH; 90-e-AL/AQ; 99-d-AL/AQ; 108-b-AL/GI/SR; 105-b-AL/EC; 112-a-AL/AQ/EC; 112-b-AL/AQ/EC; 112-c-AL; 112-d-AL/AQ; 112-e-AL/AQ; 112-f-AL/AQ; 112-g-AL/AQ/EC; 113-k-AL/AQ/RG; 113-f-AL/AQ;; 120-c-AL/AQ/EC; 120-i-AL/AQ/GI; 120-j-AL/AQ – IP; 127-c-AL/SR; 133-d-AL/AQ/SR; 134-a-AL/AQ/GI; 134-b-AL/AQ/EJ; 144-d-AL/OS; 148-a-AL/SO; 148-b-AL/SO; 148-c-AL/SO; 148-p-AL/SO; 157-b-AL/EC/SO, 157-f-AL/EC/SO; 158-b-AL/AQ/EC; 159-b-AL/SA/SR; 159-e-AL/AQ/SR; 166-b-AL/EC/SO; 166-c-AL/HH; 166-f-AL/HH; 169-b-AL/AQ/EC; 169-o-AL/EC/SO

Response*: In Chapter 8 of this SEIS, NRC staff evaluates potential effects of alternatives to license renewal. Many of these comments express concerns about air quality effects of alternatives to license renewal. NRC staff has evaluated potential air quality effects from alternatives in Chapter 8 of this SEIS. The staff's findings indicate that alternatives to license renewal would not necessarily have major effects on air quality, though those alternatives that utilized combustion technologies would have proportionately greater impacts. Air quality impacts from continued operation of IP2 and IP3 are Category 1 issues, and the staff has not found any new and significant information that would challenge this determination.*

During the public comment period on the draft SEIS, many commenters expressed concerns about the impacts of shutdown for minority and low-income populations, based on an increased reliance on older and less clean (or less efficient) electric generating stations located near minority or low income populations. While NRC staff cannot predict with certainty how electric generators would respond to the loss of Indian Point, the NRC staff assumes that new generation or new market access for existing generation (via transmission projects, for example) to loads in and around New York City would occur to offset electricity supplied by IP, rather than an increased loading for old, inefficient, and expensive generation capacity located in New York City. The NRC's framework, set forth by the GEIS, assumes that there is a need for the power generated by the IP units, and thus, simply shutting the units down would not fulfill the need for power. Thus, the staff assumes the need for some sort of replacement, which includes new

generation and energy efficiency/energy conservation (though not generation alternatives, per se, they are options used by energy planners to address the need for power). These matters are, however, outside of NRC's jurisdiction.

The NRC staff recognizes substantial efforts on the part of New York State regulatory, policy-setting, and policy-implementing agencies to promote and further renewable energy and energy efficiency in New York. The NRC staff acknowledges the State's estimates regarding the potential of renewable energy and energy conservation, as these are matters which the State exercises jurisdiction. As a result, the NRC staff disagrees with commenters who indicated that conservation or energy sources considered renewable by New York State couldn't replace at least a portion of the electricity supplied by the IP units. The NRC staff's review of alternatives includes consideration of proposed transmission projects, which could facilitate to power from new generation projects – like wind power – to reach New York City or other downstate regions served by IP2 and IP3. Thus, replacements won't necessarily occur in Westchester County or New York City. The staff also recognizes, however, that repowered facilities could be built on existing power plant sites in Westchester or New York City, though these new facilities would have modern emissions controls and would likely be substantially cleaner than the facilities they replaced.

The NRC staff has also reviewed comments indicating that coal-fired power would be infeasible, and the staff has now removed the coal-fired alternative from the range of alternatives considered in depth.

The following comments state that the socioeconomic effects discussed under the "No Action Alternative" do not accurately address the negative impacts on local communities:

9-g-AL/SO; 23-h-AL/AQ; 90-d-AL/EC/SO; 94-c-AL/EC/OE; 169-a-AL/EC/SO

Response: *Actual decisions about what types of power plants will operate, whether IP2 and IP3 get renewed licenses or not, will be made by state and utility decision makers. The NRC does not play a role in energy planning decision-making in New York. The NRC staff does, however, in Chapter 8, provide an evaluation of environmental impacts that may result from potential alternatives to license renewal. This evaluation addresses effects to air quality and whether these effects may be high and disproportionate for low income and minority communities. Issues of electrical grid stability that may result from an Indian Point shutdown would be addressed by the New York Independent System Operator (NYISO). NYISO has indicated that Indian Point plays an important role in electric reliability and supply in downstate New York, and has also indicated a potential need for Indian Point's generators to continue operating as synchronous condensers in the event that the reactors themselves shut down. (A synchronous condenser is required to provide the necessary reactive power loading for electric grid operation.) Matters related to electric rates are outside the NRC's jurisdiction; rates are set by entities buying and selling power on New York's restructured energy system.*

The following comments request that the license be conditioned to require the installation of a closed-cycle cooling system:

9-e-AE/AL; 87-d-AE/AL; 97-h-AE/AL/OE

Response: *Under the Federal Clean Water Act, the New York State Department of Environmental Conservation (NYSDEC) has the sole authority to require installation of*

measures to reduce the discharge of pollutants – including heat from operating the Indian Point reactors – to surface waters. The decision of whether to require cooling towers is a matter for the NYSDEC to decide. Information on the NYSDEC permitting processes, hearings, and decisions regarding cooling towers at Indian Point can be found at http://www.dec.ny.gov/permits/57609.html (State Pollution Discharge Elimination System process) and http://www.dec.ny.gov/permits/63150.html (Water Quality Certification process). The NYSDEC, not the NRC, has the authority to require installation and operation of cooling towers for water quality purposes.

The following comments request that the staff include a discussion of additional environmental impacts for the coal-fired generation alternative:

92-c-AL/AQ; 92-f-AL/EC; 113-i-AL/AQ; 120-l-AL; 157-c-AL/EC

Response: *Based on comments on the draft SEIS, the NRC staff has removed the coal-fired alternative from the range of alternatives considered in depth. The comments no longer apply to the SEIS.*

The following comments request more information about the natural gas fired combined-cycle generation alternative including feasibility, type, retrofitting, and location:

9-i-AL/ED; 140-oo-AL

Response: *The decision regarding which alternatives would replace IP2 and IP3 in the event that the licenses are not renewed is within the authority of New York State and utility decision-makers, not the NRC. As a result, the NRC staff's analysis in Chapter 8 is not prescriptive about the specific type of units that would be built or their specific locations. Further, Entergy is a merchant operator that sells power to load serving entities in New York, and does not have a firm obligation to serve load. Entergy, therefore, would not need to replace IP2 and IP3 if the two units cannot continue to operate. The alternatives analysis in Chapter 8 is intended to provide insight into the likely impacts of alternatives to license renewal so that the NRC can determine whether or not the adverse environmental impacts of license renewal are so great that preserving the option of license renewal for energy planning decision-makers would be unreasonable (see 10 CFR 51.95(c)(4)).*

Regarding the onsite, natural gas-fired alternative, the NRC staff understands that construction potentially could proceed while IP2 and IP3 are operating, so that the alternative might be available when IP2 and IP3 would have to shut down if the licenses are not renewed (or if Entergy chose not to continue operating the facility). The NRC staff has, as suggested in these comments, replaced "gas-fired alternative" with NGCC in the text of Chapter 8. In addition, the NRC staff has reworded the conclusion in Chapter 8 to more clearly differentiate relative impact levels of alternatives.

Finally, the NRC staff acknowledges, as suggested in these comments, that natural gas plays an important and growing role in New York State's energy portfolio.

The following comment requests greater specificity in the staff's consideration of alternatives, including wind power sourced solely from offshore windfarms, removing wood burning, and basing alternative locations on proposed but unfinished existing projects:

9-j-AL/ED/OE

Response: *The NRC staff cannot assume that wind-generated power would come from offshore wind projects, given that the vast majority of proposed wind generating projects likely to be online in New York State and surrounding areas by the time the IP2 and IP3 licenses expire is planned for onshore locations. The NRC staff notes that the wind power portion of the combination alternatives does not include specific project locations because the capacity needed exceeds any one currently-proposed project; the staff's consideration of possible impacts addresses the range that may occur at various locations. Regarding wood-fired power, the NRC staff notes that wood-burning is explicitly included in New York State's Renewable Portfolio Standard as a qualifying resource (under the category of "biomass"). Finally, the staff notes that it may be possible to locate alternatives at proposed but unfinished project locations for single-source replacements (like the NGCC alternative). The staff's consideration of both a new site and an existing power plant site (either IP or a repowered site), encompasses the potential impacts that would result from an NGCC unit at a proposed but unfinished location.*

The following comments indicate that relying on alternative means of energy production would avoid creation of nuclear waste:

11-f-AL/OR; 38-d-AL;103-c-AL

Response: *During operation, IP2 and IP3 generate several categories of radioactive waste materials, which can range from slightly contaminated clothing items to spent nuclear fuel. The NRC staff reviews waste management at IP2 and IP3 in Chapter 2, and addresses the nuclear fuel cycle – including spent fuel – in Chapter 6 of this SEIS. In Chapter 8 of this SEIS, the NRC staff evaluates environmental impacts of alternatives to license renewal, including waste generation. In general, the alternatives to license renewal considered in this SEIS do not produce radioactive waste materials.*

Insofar as portions of these comments address conversion of the IP site to a wind power site, the NRC staff notes that the site has relatively low wind potential and space for few turbines, and the staff did not, therefore, explicitly consider a wind alternative at the IP site. In addition, the NRC staff notes that comments suggesting the conversion of Sing Sing Correction Facility to a manufacturing plant, or promotion by NRC of wind and solar power are outside the NRC's statutory purview and authority.

The following comments support alternative energy sources, indicate that NRC staff's analysis of alternatives in the draft SEIS was too restrictive, or indicate that the staff's analysis was based on limited data:

2-a-AL/RI; 12-f-AL; 41-d-AL; 68-a-AL/NE/OE; 68-d-AL/OE; 73-f-AQ/WA/AL; 79-c-AL; 79-x-AL/EJ; 79-z-AL; 81-c-AL; 86-c-AL; 86-d-AE/AL/GL; 87-f-AL/OE; 95-a-AL/OE; 96-o-AL; 98-b-AL/SA; 102-a-AL/OE; 102-f-AL/OE; 110-c-AL/OP/ST; 122-d-AL; 124-a-AL/RW/SF; 129-f-AL; 129-h-AL; 129-k-AL/LR; 129-l-AL; 140-pp-AL; 140-rr-AL; 140-ss-LR; 141-d-AL/OR; 155-c-AL/SA; 170-g-AL; 173-b-AL/OR; 174-i-AL; 180-b-AL/OE; 182-d-AL/EJ/OR

Response: *In response to these comments and others, the NRC staff has updated its consideration of energy alternatives in this SEIS. In particular, the SEIS now includes conservation/energy efficiency as a full replacement alternative for Indian Point, and considers state-level reports to characterize renewable energy potential. The NRC staff addresses the impacts from alternatives in Chapter 8 of this SEIS.*

After reviewing the comments as well as available reference documents, the NRC staff determined that solar power alone, or a combination of wind and solar, would be insufficient to replace the power generated by IP2 and IP3 upon expiration of the licenses without license renewal. Similarly, sufficient tidal power capacity is not likely to be available by 2013 or 2015 to replace IP2 and IP3. New York does not have sufficient geothermal resources to function as a replacement for IP2 and IP3.

Insofar as these comments address alternatives as merely a consequence of the no-action alternative, the NRC staff disagrees. In developing and finalizing the staff's license renewal environmental rule, NRC staff specifically indicated – in response to comments from EPA, the Council on Environmental Quality, and others – that alternatives would not be handled as simply consequences of the no-action alternative. The NRC staff includes in this SEIS a range of alternatives that includes likely options that are "technically feasible and commercially viable," as set out in the GEIS. These alternatives can also be consequences of the no-action alternative, though they may be pursued by utilities even if the NRC renews a power plant license.

The GEIS limits the extent to which the staff must consider combinations of alternatives, stating, "While many methods are available for generating electricity, and a huge number of combinations or mixes can be assimilated to meet a defined generating requirement, such expansive consideration would be too unwieldy to perform given the purposes of this analysis." The GEIS also indicates the ". . . NRC has determined that a reasonable set of alternatives should be limited to analysis of single, discrete electric generation sources and only electric generation sources that are technically feasible and commercially available." GEIS S8.1. Based on scoping-stage and draft SEIS comments, the NRC staff included – and now updated – two combinations of alternatives. The staff does not include a broader portfolio of combination alternatives in this SEIS, although the impacts of the more likely individual components of such combinations have been considered.

Finally, several of these comments address issues related to energy policy choices, suggesting, for example, that the government or utilities ought to pursue different energy generating (or energy demand reducing) options. The NRC, for its part, does not engage in energy planning or in energy portfolio policy development. These matters fall under the purview of New York State (as New York asserted during the NRC's 1996 GEIS rulemaking), utility company planners, or other Federal (non-NRC) actors as indicated by law or regulation.

The following comments request additional information on the impacts of a cooling tower:

4-b-AL/LR; 10-b-AL/OE; 14-b-AL/EJ/OE; 30-a-AL/AQ/AS/EJ; 40-f-AE/OE

Response: *The NRC staff has updated its impact analysis – contained in Chapter 8 – of potential impacts from installing cooling towers at IP2 and IP3, including potential impacts to aesthetics. The NRC staff considered analyses provided to the New York State Department of Environmental Conservation (NYSDEC) by Entergy in 2010 (attachments to the analyses were developed in earlier years). These analyses are available from NYSDEC at http://www.dec.ny.gov/permits/57609.html. As the NRC staff notes throughout this SEIS, the decision of whether to install cooling towers would be made by NYSDEC, under its authority to issue SPDES permits under the Clean Water Act.*

Regarding comments that specifically address the need to provide more information for the purposes of consistency with New York's Coastal Management Plan, the NRC staff notes that Entergy will be separately applying to the New York State Department of State (NYSDOS), and the NRC SEIS is not intended to meet the specific data needs of NYSDOS for its Federal Consistency review.

Finally, several commenters expressed concerns that cooling towers would trigger major impacts because Entergy would cease operating IP2 and IP3 rather than install cooling towers. The NRC staff notes that such decisions are solely under the purview of Entergy, and the commenters' assumption that Entergy would close IP2 and IP3 appears to be speculative. As such, the NRC staff has not assumed that installing cooling towers would cause Entergy to close IP2 and IP3. Nonetheless, the impacts of license renewal denial have been considered in the Alternatives analysis of the SEIS.

The following comments indicate that environmental impacts from cooling towers would be larger than indicated in the draft SEIS:

40-j-AE/AL; 40-v-AL/TS; 40-dd-AE/AL; 40-ii-AE/AL/OE/TS; 40-pp-AL; 40-ddd-AL/TS; 40-bbb-AL/OE; 40-ccc-AL/TE; 40-dddd-TS; 40-gggg-AL; 40-hhhh-AL; 40-jjjj-AL; 40-kkkk-AL; 40-eee-AL/AQ; 40-fff-AL; 40-ggg-AL; 40-llll-AL; 40-mmmm-AL; 40-nnnn-AL; 40-oooo-AL; 40-pppp-AL; 46-c-AL/EJ/SR; 49-e-AL/EJ;49-g-AL/AQ/EJ; 112-h-AL/RG; 113-g-AE/AL/AQ; 137-f-AL/LE/PA/RF/SF; 137-h-AL; 139-f-AL/LR; 140-kk-AL

Response: *The NRC staff has updated its impact analysis, in Chapter 8, of the potential impacts from installing cooling towers at IP2 and IP3, including potential impacts to aesthetics. The NRC staff considered analyses provided to the New York State Department of Environmental Conservation (NYSDEC) by Entergy in 2010 (attachments to the analyses were developed in earlier years). These analyses are available from NYSDEC at http://www.dec.ny.gov/permits/57609.html. As NRC staff notes throughout this SEIS, the decision of whether to install cooling towers falls to NYSDEC, not NRC.*

In addition, the staff has updated all impact areas addressed by these comments and included either new information provided by the comments or new information in recent documents submitted to the NYSDEC. In general, the NRC staff does not assume that IP2 and IP3 would shut down if they are required by NYSDEC to install cooling towers. Should, after various adjudicatory and administrative process are completed, NYSDEC issue a SPDES permit indicating that IP2 and IP3 have to install cooling towers, the decision of whether to continue to operate would fall to Entergy. Nonetheless, the potential impacts of plant shutdown are considered in the SEIS.

Regarding concerns about replacement power for electricity consumed by cooling tower components and generating capacity lost due to lower thermal efficiency of the retrofitted units, the NRC staff notes that the alternatives considered in Chapter 8 would also be available to replace the capacity losses. In general, the 127 MW of replacement power that would be required during the periods of maximum capacity loss could be installed with relatively little additional environmental impact. A gas-fired alternative of this size would create an impact that is a fraction of those created by the NGCC alternative considered in Chapter 8, and could be constructed on an existing power plant site, including the existing IP site.

The following comments express support for conservation as an alternative:

51-c-AL; 103-a-AL/UF; 130-c-AL; 129-g-AL; 140-qq-AL; 154-b-AL; 160-a-AL/SA/ST; 161-i-AL/OR

Response: *As a result of comments received on the draft SEIS and as a result of efforts on the part of many State and local level organizations, the NRC staff has revised its assessment of energy conservation (used interchangeably with energy efficiency) in the FSEIS. The NRC staff now considers energy conservation as a viable, stand-alone alternative to license renewal. The staff addresses this alternative in Chapter 8 of the FSEIS.*

The following comment indicates that comparisons of greenhouse gas emissions in the SEIS should include Carbon Capture and Sequestration and address the importance of IP2 and IP3 to New York's participation in the Regional Greenhouse Gas Initiative:

40-xx-AL/AQ/OE

Response: *The NRC staff's comparisons of relative greenhouse gas emission levels in the draft SEIS did not include the effect of carbon capture and sequestration (CCS) on fossil fuel emissions. Relative emission levels in the studies the NRC staff reviewed did not assume that CCS was in place. While such efforts may well reduce the levels of carbon gas emissions, the specific cost-benefits of such methods are for State and utility decision-makers to resolve.*

The NRC staff recognizes that New York State is a part of the Regional Greenhouse Gas Initiative (RGGI), but the staff does not state the relative importance of Indian Point to achieving RGGI or State emission reduction goals. Those are matters for RGGI program administrators and State decision-makers to determine.

No change has been made to the SEIS as a result of this comment.

The following comments indicate that the draft SEIS has incorrectly addressed cooling tower costs and outage duration:

40-zz-AL/OE; 40-sss-AL; 40-iiii-AL

Response: *The NRC staff has updated the cooling towers impact assessment with information submitted since the draft SEIS publication, including cooling tower installation costs and construction times. This includes information from these comments as well as new information submitted by Entergy as part of the ongoing NYSDEC review processes. The NRC staff notes that decisions about whether to require cooling tower implementation are for the NYSDEC to determine. Evaluations of the potential impact levels are included to fulfill NRC's requirements under NEPA.*

The NRC staff has revised discussion of cooling tower installation costs and timelines based on the information that it has received. This discussion occurs in Chapter 8 of this SEIS.

The following comments request that the cooling tower alternative be removed:

34-b-AE/AL; 40-aaa-AE/AL/OE; 40-rrr-AL; 113-b-AE/AL/EJ

Response: *The NRC staff disagrees with these comments. The cooling tower alternative is considered in the SEIS, consistent with NEPA's requirements that reasonable alternatives be*

considered, regardless of whether the alternatives are outside the agency's specific regulatory purview.

The NRC staff has included additional information about the staff's rationale for maintaining the cooling tower alternative in Chapter 8 of this SEIS. The NRC staff's consideration of a cooling tower alternative is in no way intended to prejudice NYSDEC's determinations or any part of ongoing administrative and adjudicatory processes.

The following comments indicate that the restoration alternative should be removed:

40-oo-AE; 40-www-AL; 128-i-AL; 123-g-AL; 140-ll-AL

Response: *In light of comments received on the draft SEIS, as well as the staff's review of recent judicial decisions and applicable law, the NRC staff has removed the restoration alternative from the range of alternatives considered in Chapter 8 of the SEIS.*

The following comment indicates difficulty comparing the impacts of different alternatives across issue areas;

139-f-AL/LR

Response: *The NRC staff acknowledges that impacts in one resource area may not be directly comparable to impacts in another resource area. In the GEIS, however, the staff developed a system for assigning impact levels for all resource areas based on the resource characteristics. As such, a large impact on aesthetic values, for example, is not necessarily directly comparable to a large impact on land use. Impacts within resource areas are, however, directly comparable among alternatives.*

No change has been made to the SEIS as a result of this comment.

The following comment requests that the impacts of the No Action Alternative include the impacts to property values:

129-d-AL/LU

Response: *Offsite land use impacts of spent fuel storage in an ISFSI are not part of the proposed action and are not within the regulatory scope of license renewal and therefore are not addressed in the SEIS. These impacts have been addressed as part of a separate NEPA review conducted by the NRC.*

Regarding potential impacts to land use as a result of no action, the NRC staff assigned an impact level of SMALL. In the staff's discussion of possible socioeconomic impacts of no action, the staff notes that no action may result in positive effects on property values while it may also cause reductions in tax revenues for local jurisdictions.

The NRC staff notes that it is not likely that the site would be cleared by 2025, as the commenter asserts, if the licenses are not renewed. Denial of the license renewal applications would not result prompt removal of spent fuel from the IPEC site. Spent fuel would continue to be stored at the site, prior to eventual decommissioning. Even in cases where licensees immediately decommission a power plant site, dismantle existing structures, and decontaminate the site to applicable standards, ISFSIs can remain onsite and are subject to separate licensing

procedures. Further, Entergy has not indicated that it would immediately initiate site dismantling and decontamination if its licenses are not renewed. NRC decommissioning regulations provide that licensees may maintain a facility in SAFSTOR status for up to 60 years before fully decommissioning a site.

The following comments request that the staff address New York's renewable portfolio standard and efforts to implement renewable energy in the alternatives analysis:

129-i-AL; 132-a-AL/OE

Response: *The NRC staff has revised the SEIS to add information regarding New York State's renewable energy and energy efficiency (energy conservation) programs to the extent that they are useful in determining whether alternatives are reasonable. Also, the staff considers a stand-alone conservation/energy efficiency alternative to license renewal in the final SEIS. In addition, the NRC staff has drawn on projections of renewable energy capacity developed by and for New York State agencies, and has updated its treatment of renewable alternatives.*

The following comment indicates that the staff's characterization of a critical transmission congestion area and transmission line capabilities are inaccurate:

129-j-AL

Response: *The NRC staff has removed language regarding critical congestion areas and has instead indicated that power transmission in New York State is highly congested. The NRC staff has also included a discussion in Chapter 8 of this SEIS of several proposals for new transmission as indicative of potential ways to transmit energy from upstate New York to New York City and Long Island.*

The following comment requests the use of updated information from the Energy Information Administration (EIA) concerning alternative energy sources:

140-mm-AL

Response: *The NRC staff has included updated information from EIA's 2010 Annual Energy Outlook, and has generally updated related information in Chapter 8 of this SEIS.*

The following comment indicates that the NRC staff devoted most of its alternatives analysis to a coal-fired replacement and also requests that staff consider the alternative of license renewal for one of the Indian Point units:

140-nn-AL

Response: *Regarding a separate analysis of each unit, the NRC staff has addressed – in both the draft and final SEISs – renewal of only one unit as a portion of a combination of alternatives.*

Regarding portions of this comment that address the coal-fired alternatives, the NRC staff has removed the coal-fired alternative from the range of alternatives considered in depth in the final SEIS.

The following comment calls for an expanded analysis of the no action alternative:

9-f-AL/OE

Response: *The NRC staff notes that, in the 1996 Statement of Consideration accompanying the publication of the NRC's environmental regulations for the license renewal rule, the NRC committed to review alternatives to license renewal as direct alternatives to the proposed action, rather than merely as consequences of the no-action alternative. As such, the NRC staff reviews a variety of alternatives to the proposed action in this SEIS. The NRC staff's consideration of no action is limited to the direct effects of shutdown because the staff has reviewed effects of decommissioning as well as the effects of other reasonable alternatives in other sections of the SEIS. The NRC staff indicates, in Chapter 8, that additional impacts as a result of replacement power or other actions will occur beyond the direct impacts of IP2 and IP3 shutdown and those impacts are considered in the SEIS.*

Typically, matters related to energy costs are within the purview of State and utility decision-makers. In New York State's restructured energy market, energy costs are also dependent on competition among energy producers and suppliers, as well as transmission owners and operators, and the New York Independent System Operator. These matters are generally outside of NRC's jurisdiction.

The following comment requests a change in classification of the impacts of green house gases and air quality of the proposed alternatives:

40-hhh-AL/ED

Response: *The NRC staff has removed the coal-fired alternative from the range of alternatives considered in depth and has adjusted the performance of the NGCC alternative as indicated by these comments. Given that there is no specific regulatory system for assigning impacts from greenhouse gases, the NRC staff has not assigned specific impact levels as a result of greenhouse gas emissions. The NRC staff does, however, assess relative GHG emission levels in Chapter 6 of this SEIS, and addresses the cumulative impacts of climate change in Chapter 4. The NRC staff has also corrected the land use figures for wind power in consideration of these comments.*

The following comments are general statements opposed to alternatives to license renewal involving coal- or natural-gas fired power generation and general support of Indian Point on the grounds of avoided incremental impacts on existing air quality and greenhouse gas (GHG) emissions.

23-e-AQ; 46-b-AQ/EJ; 86-b-AQ; 88-a-AQ; 90-b-AQ; 119-h-AQ; 133-c-AQ; 177-c-AQ

Response: *In Chapter 8 of this SEIS, NRC staff evaluates potential effects of alternatives to license renewal including impacts on air quality. Section 2.2.4.3 in the IP SEIS describes the existing ambient air quality within a 50-mi (80-km) radius of the site and encompassing the currently designated nonattainment areas of New York and New Jersey. Actual decisions about what types of power plants will operate, whether IP2 and IP3 get renewed licenses or not, will be made by decision makers on the state level and the utility level. NRC does not play a role in energy planning decision-making. The NRC staff does, however, in Chapter 8, provide an evaluation of environmental impacts that may result from potential alternatives to license renewal. As described in Section 8.3 of this SEIS, the NRC staff has now removed the coal-fired alternative from the range of alternatives considered in depth based in part on comments indicating that coal-fired power would be infeasible or highly unlikely. Replacement of the*

electricity supplied by the IP units with a natural-gas fired plant, now referred to as the Natural Gas-Fired Combined-Cycle (NGCC) alternative, remains a reasonable alternative. Section 8.3.1 specifically addresses the impacts of a new NGCC plant located at either the IP2 and IP3 site or an alternate site; Chapter 8 also considers combinations of alternatives that include substantial amounts of renewable energy sources. Air quality impacts from continued operation of IP2 and IP3 are Category 1 issues, and the staff has not found any new and significant information that would challenge this determination. The NRC staff also assesses relative GHG emission levels in Chapter 6 of this SEIS, and addresses some cumulative impacts of climate change in Chapter 4. As presented in Chapter 8, the staff's findings indicate that alternatives to license renewal would not necessarily have major effects on air quality, though those alternatives that utilized combustion technologies would have proportionately greater impacts.

A.2.15 Comments Concerning Decommissioning Issues

The following comment questions the decommissioning process regarding spent fuel and the current status of 'long term storage' at the facility:

96-f-DC/LE/WA

Response: *The storage of spent nuclear fuel is discussed in Chapter 7 of the SEIS. The safety and environmental effects of spent fuel storage have been evaluated by the NRC and, as set forth in the Waste Confidence Rule (10 CFR 51.23), the Commission has made a generic determination that, if necessary, spent fuel generated in any reactor can be stored safely and without significant environmental impacts for at least 30 years beyond the licensed life of operation (which may include the term of a revised or renewed license) of that reactor at its spent fuel storage basin or at either onsite or offsite independent spent fuel storage installations. In addition, on September 15, 2010, the Commission approved a revision to the agency's "Waste Confidence" findings and regulation, expressing its confidence that the nation's spent nuclear fuel can be safely stored for at least 60 years beyond the licensed life of any reactor and that sufficient repository capacity will be available when necessary. However, until a revised final rule is issued, the current determination under 10 CFR 51.23 remains in effect at this time and governs the consideration of this issue.*

The GEIS for license renewal (NUREG-1437) evaluated a variety of spent fuel and waste storage scenarios, including on site storage of these materials for up to 30 years following expiration of the operating license, transfer of these materials to a different plant, and transfer of these materials to an Independent Spent Fuel Storage Installation (ISFSI). During dry cask storage and transportation, spent nuclear fuel must be "encased" in NRC-approved casks. An NRC-approved cask is one that has undergone a technical review of its safety aspects and been found to meet all of the NRC's requirements. These requirements are specified in 10 CFR Part 72 for storage casks and 10 CFR Part 71 for transportation casks. For each potential scenario involving spent fuel, the GEIS determined that existing regulatory requirements, operating practices, and radiological monitoring programs were sufficient to ensure that impacts resulting from spent fuel and waste storage practices during the term of a renewed operating license would be small, and that this is a Category 1 issue. This conclusion is contained in

Table B-1 of Appendix B to Part 51. In sum, the Commission concluded that the impacts associated with spent fuel and high-level waste disposal are Small. The Staff's evaluation of the IP2 and IP3 license renewal application did not find any new and significant information related to the storage of spent nuclear fuel. Thus, there are no impacts related to spent nuclear fuel storage beyond those discussed in the GEIS.

The staff notes that on March 3, 2010, DOE submitted a motion to the Atomic Safety and Licensing Board seeking to withdraw its application for a permanent geologic repository at Yucca Mountain, Nevada. The ASLB denied that request and this matter is now pending before the Commission. Notwithstanding DOE's decision to seek to withdraw its Yucca Mountain repository application, the Nuclear Waste Policy Act establishes the Federal government's responsibility to provide a place for the permanent disposal of high-level waste and spent nuclear fuel. The Act authorizes and requires the DOE to locate and build a permanent repository and an interim storage facility and develop a transportation system between nuclear power plants and the repository and interim storage facility. Accordingly, while DOE has not yet specified an alternative to Yucca Mountain, there is every reason to believe that a permanent solution to the issue of spent fuel storage will be achieved. Further, until the DOE takes possession of it, the spent nuclear fuel will be safely stored at the nuclear power reactor site, subject to NRC oversight ad regulation.

The following comment questions why the assessment of decommissioning is not a site specific issue:

137-I-DC/RW

Response: *The NRC's license renewal process classifies environmental and human health issues as either Category 1 (generic to all nuclear power plants) or Category 2 (requires a site specific evaluation). For license renewal, the NRC performed a comprehensive evaluation of all nuclear power plants in the United States to assess the scope and impact to public health and safety and the environment from radioactive material released from a nuclear power plant for an additional 20 years of operation. That impact evaluation is presented in the Generic Environmental Impact Statement for License Renewal of Nuclear Plants NUREG-1437 (GEIS). The GEIS identified 92 environmental issues that were considered for the license renewal evaluation for power reactors in the U.S. The nuclear industry, Federal, state, and local governmental agencies, members of the public, and citizen groups commented on and helped identify these 92 issues during the preparation of the GEIS. For each of the identified 92 issues, the staff evaluated existing data from all operating power plants throughout the U.S. From this evaluation, the staff determined which issues could be considered generically and which issues do not lend themselves to generic consideration. The GEIS divides the 92 issues that were assessed into two principle categories: One for generic issues (which are termed "Category 1 issues") and the other for site-specific issues (termed "Category 2 issues").*

Category 1 issues are termed "generic" issues because the conclusions related to their environmental impacts were found to be common to all plants (or, in some cases, to plants having specific characteristics such as a particular type of cooling system). For Category 1 issues, a single level of significance was common to all plants, mitigation was considered, and the NRC determined that it was not likely to be beneficial. Issues that were resolved generically are not reevaluated in the site-specific supplement to the generic environmental impact

statement on license renewal (SEIS) because the conclusions reached would be the same as in the GEIS, unless new and significant information is identified that would lead the NRC staff to reevaluate the GEIS's conclusions. During the environmental reviews of license renewal applications, the NRC staff makes a concerted effort to determine whether any new and significant information exists that would change the generic conclusions for Category 1 issues. The following issues associated with decommissioning were evaluated in the GEIS: radiation doses, waste management, air quality, water quality, ecological resources, and socioeconomic impacts. The evaluation concluded that all of the issues were Category 1 issues that are generic to all nuclear power plants and the impacts would be small.

During the scoping process and the environmental review, the NRC looks for any information that could demonstrate that there are unique characteristics related to the facility or the environment surrounding the facility that would lead to the conclusion that the generic determination for a particular issue is not valid for a specific site. The NRC staff discusses and evaluates potential new and significant information on impacts of operations during the renewal term in the SEIS.

As with all Category 1 conclusions, the NRC staff review evaluates each license renewal application and the site to determine if there is new and significant information that would change the conclusion in the GEIS.

The comments relating to decommissioning issues have been thoroughly evaluated in the GEIS for license renewal. No new and significant information was identified during the scoping process, the review of the IPEC Environmental Report, and the Staff's site visit beyond those identified and evaluated in the GEIS. No changes will be made to the SEIS based on these comments.

A.2.16 Comments Concerning Greenhouse Gas Issues

The following comments indicate that the greenhouse gas analysis in the draft SEIS is based on one outdated study:

10-c-GL; 50-t-GL/UF

Response: *The NRC staff's consideration of potential greenhouse gas emissions from nuclear power as well as other alternatives relied on a number of studies, and not merely on Mortimer's work, as stated in the comment. The NRC staff mentioned Mortimer as an early example of an attempt to determine greenhouse gas emissions from nuclear power, and included his 1990 study as only one of many. While some of Mortimer's assumptions may no longer be valid, the NRC staff notes that some of changes to his assumptions (like ore grades) may result in greater greenhouse gas (GHG) emissions from the nuclear fuel cycle, while others (e.g., new enrichment methods and programs like the Megatons to Megawatts program that turns former Soviet nuclear warheads into U.S. reactor fuel) likely result in lower GHG emissions from the nuclear fuel cycle than Mortimer calculated. The NRC staff considered each of these factors prior to including Mortimer, and determined that it was reasonable to include Mortimer's study along with other, more-recent studies. The NRC staff concluded that reduced grades of nuclear fuel in the future would likely lead to greater GHG emissions, but that improved enrichment technologies may reduce GHG emissions. On the whole, the staff concluded that GHG emissions from the nuclear fuel cycle would likely remain below the GHG emissions from equivalent fossil-fuel facilities throughout the period of extended operation, and that GHG emissions from equivalent renewable sources may be lower during the period of extended*

operation. The comments provided no new or significant information, and NRC staff has made no changes to the SEIS as a result of these comments.

The following comment states that emissions from fossil fuel power plants result in global climate change:

14-d-AL/EJ/GL

Response: *The NRC staff acknowledged, in Chapter 6 of the draft SEIS, that all forms of power generation, including fossil fuel power plants, result in GHG emissions during their lifecycles. No changes have been made to the SEIS as a result of this comment.*

The following comment indicates that climate change effects on the Hudson River may become catastrophic in the future:

86-d-AE/AL/GL;

Response: *In Section 4.8.1, the NRC staff indicated that climate change could have widespread and noticeable effects on the Hudson River ecosystem. This comment does not present any new information, and the staff has not made any changes to the SEIS as a result of the comment.*

The following comments indicate that continued operation of Indian Point in concert with climate change results in even greater effects to Hudson River biota:

87-e-GL; 102-b-AE/GL/OE; 102-i-AM/GL/OE; 147-a-GL/LE; 180-d-AM/GL/OE

Response: *The NRC staff noted, in section 4.8.1, that cumulative effects to the Hudson River ecosystem are likely to be large. In reaching this conclusion, the NRC staff considered the impacts from continued Indian Point operation and the effects of climate change, as well as other environmental stressors like water withdrawals and invasive and nuisance species. Should rising river temperatures cause Indian Point to exceed the discharge temperature limits in its SPDES permit at some point in the future, the New York State Department of Environmental Conservation may take action to enforce the terms of the SPDES permit. These comments contain no new information, and the staff has not made any changes to the SEIS as a result of these comments.*

The following comments indicate that climate change will result in more-frequent storms and flooding, thus increasing corrosion and the likelihood of leaks:

102-i-AM/GL/OE; 147-a-GL/LE; 180-d-AM/GL/OE

Response: *These comments indicate that potentially increased storm and flooding events as a result of climate change would accelerate corrosion in buried piping and other systems. In general, aging of plant systems, structures and components is a matter for the safety review, and monitoring for leakage is a matter for ongoing NRC oversight.*

As part of the license renewal safety review, the NRC staff reviewed Entergy's proposed Aging Management Program (AMP) for managing the aging effects of buried and underground piping. The NRC staff is also in the process of revising its guidance in the Generic Aging Lessons Learned (GALL) Report to capture recent industry and plant-specific operating experience to

effectively manage any potential aging effects for such piping. The results of the staff findings for the safety review are documented in the Safety Evaluation Report (SER) for license renewal.

Although climate change may trigger storms with increased severity, and may also increase the likelihood of flooding events at some sites, climate change could also trigger longer periods of dry weather or drought, which may result in reduced precipitation and soil moisture. Thus, potential climate change, by itself, does not warrant new evaluations or conclusions regarding buried piping beyond the staff's finding in the SER for license renewal or ongoing oversight of any potential leaks at reactor facilities.

The NRC staff has not made any changes to the SEIS as a result of these comments.

The following statements indicate that IP emits few greenhouse gases and is inexpensive to operate:

33-a-AE/GL/LE; 159-a-EC/GL

Response: *The NRC staff notes that nuclear facilities, while emitting essentially no GHGs during power generation, do result in GHG emissions during their lifecycles. Fuel mining, enrichment, fabrication, and transportation, for example, all result in GHG emissions. Also, GHGs are produced in manufacturing raw materials to construct nuclear power plants. Similarly, other energy sources that do not produce carbon dioxide or other GHGs while generating electricity result in GHG emissions at other points in their lifecycles.*

The NRC has no authority to choose between alternative energy generating technologies, or to consider cost of operation in its license renewal decisions. Such decisions are within the jurisdiction of State, utility, and where appropriate, other Federal entities.

No changes have been made to the SEIS as a result of this comment.

The following are general statements expressing concern over potential climate change effects on the Hudson River and indicate that Indian Point has either minor or mitigative effects on climate change by comparison:

113-h-AE/GL; 113-d-AQ/GL/SR

Response: *The NRC staff evaluated cumulative impacts to the Hudson River, including impacts as a result of climate change along with other factors affecting the river. In addition, staff evaluated the potential impacts of continued Indian Point operation and other alternatives on the Hudson River and its biota. These comments provide no new information, and, as a result, the staff has made no changes to the SEIS in response to these comments.*

A.2.17 Comments Concerning Editorial Issues Not Otherwise Addressed in This Appendix

Page 2-77, line 34-35 – Delete extra words and add reference:

40-t-AE/ED

Response: *Editorial change made.*

Remove the reference to transmission lines on page 4-52, line 9-11 because the lines are all on the Indian Point site.

40-rr-AE/ED/TL

Response: *Editorial change made.*

Change section heading to "protected species"

40-u-ED/TS

Response: *The NRC staff has changed the SEIS section heading to 4.6.1, Aquatic Special Status Species.*

Page 8-54, line 18-19 – Change "hypotheses" to "conclusions."

40-ooo-AE/ED/OE

Response: *Editorial change made.*

Page 2-16, line 3 – The FSEIS should stat that IP1 provides waste processing for IP2 only.

40-l-ED

Response: *Editorial change made.*

Page 2-22, line 15-18 – Replace the paragraph with one suggested.

40-m-ED

Response: *Editorial change made, with some modifications.*

Page 4-53, line 26 – Start new paragraph after "… vicinity of the site."

40-ss-ED

Response: *Editorial change made.*

Page 4-2, Table 4-1 – Remove "Eutrophication" from table
Page 4-3, line 1-4 – Replace the sentence with one suggested.
Page 4-6, line 6-10 – Replace the sentence with one suggested.

40-x-ED

Response: *The NRC staff has considered these editorial comments. NRC staff has retained "eutrophication" as a Category I issue in Table 4-1 as it is listed in the GEIS as applicable to all plants. As the NRC staff noted, no new and significant information related to this issue was identified during the staff's review. The NRC staff has made the indicated text changes on page 4-3 and 4-6. .*

Page 4-8, line 12-13 – Replace the sentence with one suggested.
Page 4-8, line 31-32 – Revise FSEIS to note that the NYSDEC was discussing generalized characteristics of ecosystems, not the specific characteristics of the Hudson River ecosystem.

40-aa-ED

Response: *The NRC staff has made the change on lines 12-13 regarding the status of the SPDES permits. The NRC staff has not changed the quoted text on lines 31-32, as that text was taken directly from page 29 of NYSDEC's 2003 Hudson River Power Plants FEIS. The statement is quoted directly from an NYSDEC staff-written portion of the document.*

Page 4-63, line 15-7 – Insert suggested wording after "… depending on the species."
Page 5-6, Table 5-3 – The last entry for IP3 (loss of essential service water) should be $1.8x10^{-8}$ rather than $1.9x10^{-9}$.

40-vv-ED

Response: *The NRC staff has made the proposed change to what were formerly lines 15-17 of page 4-63. The NRC staff has also changed the text in Table 5-3.*

Page 8-2, line 6-7 – Revise FSEIS to note that the "normal design flow rate" given in the DSEIS is actually the maximum design flow rate.
Page 8-2, line 14 – "Has" should be changed to "may potentially have."

40-yy-ED

Response: *Editorial changes made.*

Page 9-9, Table 9-1 – Change "SMALL to LARGE" under Coal-Fired Plant Alternate Site column to "MODERATE."
Page E-3, Table E-2 – Add footnotes suggested.
Page E-4, Table E-2 – Add footnotes suggested.
Page E-4, Table E-2 – Provided updated status of various certificates and permits.

40-iii-ED

Response: *The first editorial change is no longer applicable due to changes to the SEIS. The staff has made the remainder of the changes in this comment.*

A.2.18 Comments Concerning Refurbishment

The following comment indicates that the draft SEIS did not address the potential impacts of replacing the reactor vessel heads and control rod drive mechanisms for IP2 and IP3:

137-k-RF

Response: *Chapter 3 of the DSEIS provides the NRC staff's analysis of the potential impact of refurbishment activities associated with the possible replacement of reactor vessel heads and control rod drive mechanisms at IP2 and IP3. No change has been made to the SEIS as a result of this comment.*

A.2.19 Comments Outside the Scope of the Environmental Review for License Renewal: Safeguards and Security; Operational Safety; Aging Management; Need for Power; Energy Costs, etc.

The following comments address various issues outside the scope of license renewal:

83-a-OS; 131-a-OS; 151-b-OS; 120-d-OS

Response: *These comments include a narrative about personal involvement in a fish study, a statement indicating that Indian Point provides funding for scholarships in nuclear fields, an assertion that Riverkeeper has historically worked to restore the Hudson River, and an assertion that individuals living near Three Mile Island unit 2 would've traded economic gains from the power plant to avoid the 1979 accident at that facility.*

These comments do not address matters within the scope of this review, and the staff has made no changes to the SEIS as a result of these comments.

The following comment is a general statement that nuclear waste is used for weapons:

84-b-OS

Response: *The commenter appears to address the use of depleted uranium by the United States armed forces for certain types of munitions meant to pierce hardened vehicles or facilities. Depleted uranium is a byproduct of uranium enrichment and is not produced at the Indian Point site. Spent nuclear fuel and the other types of radioactive waste materials generated at IP2 and IP3 are disposed of according to federal regulations. Spent fuel resides in IP2 and IP3 spent fuel pools or the site's dry cask storage facility, as discussed in Chapter 6. Low-level wastes are either stored onsite or shipped offsite for disposal, as discussed in Chapter 2.*

A.2.19.1 Aging Management

The following comments question the reliability and performance of plant operations to ensure proper plant management:

13-f-AM/GE/OM; 32-a-AM/OP/PA; 35-c-AM/RW; 41-b-AM/SF; 44-b-AM/DE/SF; 63-e-AM; 73-h-AM/LR/ST; 96-c-AM/LE/OM; 96-n-AM/LE; 102-n-AM; 121-b-AM/LE; 141-b-AM/DE/PA/RW; 145-a-AM/PA; 147-c-AM; 153-e-AM; 174-g-AM; 179-g-AM; 180-i-AM

Response: *Extensive studies and experience have shown that commercial nuclear power facilities can be safely operated for more than 40 years. As a result, the NRC has provided an option in Title 10 of the Code of Federal Regulations (10 CFR) that allows owners of nuclear power reactors to seek license renewal for up to an additional 20 years with no limitations on the number of times the license may be renewed. The decision whether to seek license renewal, including the length of the renewal period, rests entirely with nuclear power reactor owners and typically is based on the plant's economic viability and whether it can continue to meet NRC safety and environmental requirements. The NRC bases its decision regarding license renewal on whether the facility would continue to meet the requirements for safe operation and whether the protection of the environment can be assured during the renewal term.*

Steps the NRC takes to ensure that each licensee meets its primary responsibility of plant safety include the ongoing licensing process, the Reactor Oversight Process, and the Enforcement Program.

The Reactor Oversight Process is composed, in part, of an inspection program. The core of the NRC inspection program for nuclear power plants is carried out by a minimum of two, on site resident inspectors. The NRC baseline inspection program typically consists of approximately 2700 hours per site. In the implementation of the baseline program, the NRC can make adjustments to the inspection plan based on plant performance trends. The NRC screens each event and assesses its safety significance, identifies the need for prompt follow-up, determines the need for plant-specific or generic licensing-related action, and/or identifies abnormal occurrences.

The concerns expressed in these comments are assessed on an ongoing basis and are outside the scope of the environmental review for license renewal.

The following comments question the IP exemption from a one-hour fire rating requirement:

87-c-AM/HH/OM; 102-o-AM; 152-b-AM/SA; 152-b-AM/SA; 153-c-AM; 174-h-SA; 180-j- AM

Response: *The fire exemption addressed in these comments refers to the Hemyc electrical raceway fire barrier system (ERFBS). In response to testing performed by the NRC in 2005 reflecting potential non-conformance to the 1-hour fire rating, Entergy performed testing on the system and declared the Hemyc ERFBS at Indian Point 3 inoperable. Entergy implemented temporary compensatory measures including an hourly fire watch and verification that the fire detection systems were operable in the affected areas until compliance was restored for the Hemyc ERFBS.*

In a letter dated July 24, 2006, Entergy stated that it would modify the installed Hemyc ERFBS based on the test results. These modifications provided at least a 24-minute rated fire barrier for cable tray configurations, and a 30 minute rating for conduit and box configurations, between redundant trains of safe shut down equipment and cables. Entergy asserted that in light of the

minimal fire hazards and the existing fire protection features in the affected areas, this configuration continues to satisfy the basis for an exemption in accordance with 10 CFR 50.12.

Upon extensive review the NRC staff concluded that the 30-minute fire barrier is adequate for protection of the redundant safe shutdown equipment, due to the lack of significant combustible loading in the area, the partial fire wall which localizes a postulated fire from affecting redundant equipment, and the available fire detection and manual suppression systems. The referenced exemption was granted on September 28, 2007. The exemption relates to a safety issue and is beyond the scope of the environmental review for license renewal.

The following comments question the inspection process and ability to manage buried piping:

102-i-AM/GL; 153-d-AM/LE/OM; 180-d-AM/GL; 183-b-AM/OM

Response: *The principal concerns presented in these comments relate to the aging of buried piping important to the continued safe operation of the facility. As part of the safety review for license renewal, the NRC staff makes the determination whether aging effects will be adequately managed throughout the period of extended operation.*

The buried piping and tanks inspection program includes preventative measures to mitigate corrosion and inspections to manage the effects of corrosion on the pressure retaining capability of buried carbon steel, gray cast iron, and stainless steel components. The Generic Aging Lessons Learned (GALL) contains the staff's generic recommendation and evaluation of plant programs and documents the technical basis for determining whether existing programs are adequate without modification or should be augmented for the extended period of operation.

In consideration of recent operating history, which involved a February 2009 leak on the return line to the condensate storage tank for Unit 2, the applicant submitted an amendment to the License Renewal Application which modified the Buried Piping and Tanks Inspection Program. The applicant's modification to the Buried Piping and Tanks Inspection program significantly increases the number of inspections as compared to its original submittal.

The aging management of safety systems is part of the license renewal safety review. The Buried Piping and Tanks Inspection Program is addressed in the "Safety Evaluation Report Related to the License Renewal of Indian Point Nuclear Generating Unit Nos. 2 and 3," Section 3.0.3.1.2.

Issues raised in these comments are beyond the scope of the environmental review for license renewal.

The following comments are concerns over inspections of the containment dome:

35-a- AM/LE; 152-d-AM/OP

Response: *The principal concerns raised in these comments relate to the aging management of the containment and potential loss of intended function. As part of the safety review for license renewal, the NRC makes the determination whether aging effects will be adequately managed throughout the period of extended operation.*

The aging management of safety systems is part of the safety review. The Containment Inservice Inspection Program is addressed in the NRC staff's "Safety Evaluation Report Related

to the License Renewal of Indian Point Nuclear Generating Unit Nos. 2 and 3," Section 3.0.3.3.2.

These comments pertain to issues that are beyond the scope of the license renewal review for license renewal.

A.2.19.2 Safety

The following comments express general support for the safety of the plant:

29-c-EC/SA; 48-g-AQ/SO; 57-a-SA; 52-a-SA; 56-f-AL/SA; 57-c-SA/SE/SO; 90-a-SA; 115-a-SA/SE/SO; 120-a-EC/SA; 127-a-SA/SR; 137-a-SA/SR; 144-a-EC/SA/SR; 150-a-SA/SE; 150-b-SA/SO; 150-c-SA/SE; 159-b-AL/SA/SR

Response: *The comments support the general safety of Indian Point. The comments provide no new and significant information; therefore, no changes were made to the SEIS in response to these comments.*

The following comments are opposed to Nuclear Power due to the associated risks of operation:

9-b-OR/SA; 13-f-AM/GE/OM; 64-a-LE/OM/OR/RW; 74-b-SA; 75-c-EC/SA; 87-c-AM/HH/OM; 96-c-AM/LE/OM; 98-b-AL/SA; 102-m-GE/OM; 151-c-SA; 155-c-AL/SA; 160-a-AL/SA/ST; 164-d-LR/OM; 174-f-GI/OM; 179-a-SA/RW/SF; 179-b-LE/OP/SA; 179-h-OR/SA; 180-h-GI/OM;

Response: *These comments are general in nature and address concerns regarding the safe operation of IPEC. Steps the NRC takes to ensure that each licensee meets its primary responsibility of plant safety include the ongoing licensing process, the Reactor Oversight Process, and the Enforcement Program.*

The concerns expressed in these comments are assessed on an ongoing basis and are outside the scope of the environmental review for license renewal.

A.2.19.3 Energy Costs/Energy Needs

The following are general comments stating the energy supplied by Indian Point will need to be replaced if the license is not renewed:

7-d-AQ/EC/SR; 34-a-AL/EC; 36-c-AL/AQ/EC; 52-c-AL/AQ/EC; 56-a-AL/AQ/EC; 67-b-EC

Response: *The NRC staff assumes, as part of its environmental review, that the power supplied by a power plant currently undergoing license renewal review is needed. Thus, NRC staff assumes that some form of power generation or demand reduction would be necessary if a license were not to be renewed. In Chapter 8, the NRC staff considers the environmental impacts of a range of alternatives to license renewal.*

These comments contain no new information, and the NRC staff has made no changes to the SEIS as a result of them.

The following comments indicate that Indian Point shutdown would increase energy costs, reduce reliability, or would be problematic because alternatives are not available or are too difficult to site and permit:

1-b-EC/SE; 1-c-EC/SO; 19-a-EC/SR; 19-b-EC/SO/SR; 23-f-EC/SO; 23-i-EC/SO/SR; 26-a-EC/LR; 26-c-EC/SO/SR; 28-a-EC/SR; 28-b-EC/SO; 29-c-EC/SA; 42-a-EC/SR; 42-f-EC/SO; 57-b-AQ/EC/SO; 57-e-EC/OP/SO; 65-b-EC/SR; 65-c-EC/SO/SR; 67-c-EC; 85-c-EC/SO/SR; 88-c-EC/SR; 90-d-AL/EC/SO; 111-c-EC/SO; 116-b-EC/SO; 118-b-EC/EJ/SR; 120-g-EC; 133-b-EC; 144-a-EC/SA/SR; 146-b-EC; 157-c-AL/EC; 157-d-EC/SR; 159-d-EC; 169-b-AL/AQ/EC; 177-a-AQ/EC/SO; 177-b-EC; 1-a-EC/SO/SR; 1-d-AQ/EC; 31-b-EC/EJ/HH; 45-b-AL/EC/EJ; 46-a-EC/SR; 48-b-EC/SO; 49-h-AQ/EC; 92-a-EC/SO; 92-f-AL/EC; 105-c-EC/SR; 113-j-EC; 119-c-AQ/EC/SO; 119-e-EC/GI/SO; 120-c-AL/AQ/EC; 157-b-AL/EQ/SO; 157-f-AL/EC/SO; 169-a-EL/EC/SO; 19-c-EC/SO/SR; 23-d-EC; 40-g-EC; 42-b-EC/SO; 58-c-AQ/EC/SO; 78-b-EC/GI/ST; 85-a-EC/SO/SR; 88-b-EC/SR; 99-c-AL/EC; 101-b-EC; 108-a-EC/SO/SR; 109-b-EC/EP; 119-b-EC/SO; 119-g-EC/SO/SR; 120-a-EC/SA; 131-e-AQ/EC/SR; 133-a-EC/SO/SR; 146-d-EC/SO; 150-d-EC/SR; 158-b-AL/AQ/EC; 159-a-EC/GL

Response: *The issues raised in these comments – electric rates, grid reliability, difficulty siting and permitting new power plants, concerns about the relative success of electric-sector restructuring, or restrictions on replacement options due to the Regional Greenhouse Gas Initiative (RGGI) – are all outside the jurisdiction of the NRC and generally outside the scope of license renewal.*

Matters relating to electric system planning, transmission planning, electric grid reliability, and new power plant siting and permitting are generally under the jurisdiction of New York State. In the case of grid function and reliability, the New York Independent System Operator – established under New York State law – is the responsible organization. Electricity prices are established by New York utilities or energy supply companies depending on available market rates.

The NRC staff acknowledges NYISO concerns regarding reliability and also discusses RGG I in Chapter 8 of this SEIS.

Many commenters raised concerns about electric prices as a result of possible shutdown. In general the staff is not required to address economic costs or economic benefits of the proposed action (license renewal or alternatives), as indicated in 10 CFR 51.95(c)(2):

> *The supplemental environmental impact statement for license renewal is not required to include discussion of need for power or the economic costs and economic benefits of the proposed action or of alternatives to the proposed action except insofar as such benefits and costs are either essential for a determination regarding the inclusion of an alternative in the range of alternatives considered or relevant to mitigation.*

NRC staff have, however, included a statement recognizing concern with possible electrical price effects in Chapter 8 of this SEIS.

The following is a general comment indicating that IP2 and IP3 can be replaced:

75-c-EC/SA

Response: *In Chapter 8 of this SEIS the NRC staff consider alternative means of supplying electrical power that are capable, in the NRC staff's professional judgment, of replacing the power currently supplied by Indian Point. If NRC decides to issue renewed licenses, then the choice about whether to operate Indian Point or rely on other energy alternatives is up to utility and state-level decision makers. If NRC decides not to issue renewed licenses, then it will be up to utility and state-level decision makers to decide how to replace the capacity currently supplied by Indian Point. No changes have been made as a result of this comment.*

The following comment indicates that nuclear power is subsidized and asserts that NRC should provide actual costs for nuclear power:

81-b-EC

Response: *The cost of power from continued operation of Indian Point and its alternatives, as well as cost-benefit analyses of Indian Point and its alternatives, are generally outside the scope of the NRC's license renewal environmental review. As indicated in 10 CFR 51.95(c)(2):*

> *The supplemental environmental impact statement for license renewal is not required to include discussion of need for power or the economic costs and economic benefits of the proposed action or of alternatives to the proposed action except insofar as such benefits and costs are either essential for a determination regarding the inclusion of an alternative in the range of alternatives considered or relevant to mitigation.*

In this case, continued operation of Indian Point is already included in the range of alternatives, and none of the alternatives considered by staff in Chapter 8 were eliminated on the basis of cost. This comment provides no new information, and no changes have been made to this SEIS as a result.

The following are general comments expressing a need for power:

92-a-EC/SO/SR; 92-b-EC/SO; 94-c-AL/EC/OE; 105-b-AL/EC; 112-a-AL/AQ/EC; 112-b-AL/AQ/EC; 127-b-EC/SO; 144-b-EC/SO; 155-a-EC/SO; 159-c-EC/SR

Response: *NRC license renewal rules assume that a need exists for the power currently supplied by Indian Point. The New York Independent System Operator (NYISO) is the state-level organization tasked with maintaining electric grid reliability and monitoring adequacy of state-level power supplies. Other state-level agencies, like the Department of Public Service, oversee permitting for new power projects. The NRC plays no role in either electric system planning or new facility construction in New York State, and has no authority to reinstate the State's expired Article X power plant siting authority. As a result, issues related to electric system planning and consequences of Article X's expiration are outside the scope of license renewal. No changes have been made to this SEIS as a result of these comments.*

A.2.19.6 Emergency Preparedness

The following are general comments expressing opposition to the evacuation plan:

6-a-EP/OR/OS; 9-d-EP; 13-g-DE/EP; 17-b-EP/ST; 17-m-EP; 17-r-EP/GI/RI; 35-b-EP; 47-b-EL/EP/SF; 50-d-EP/HH; 50-p-DE/EP/NE; 72-a-EP/LE/OR/RW; 73-d-EP; 75-b-EP/LE/OP/ST; 80-a-EP/OR/RW/ST; 87-a-DE/EP; 97-g-EP/PA; 98-a-EP/OR/PA; 124-b-EJ/EP/HH/PA; 125-a-DE/EP; 128-b-AE/EP/TS; 128-s-EP; 137-q-EP; 140-b-EP; 149-d-EP/HH/RI; 151-d-EP; 152-a-

GE/PA; 164-b-EP; 164-e-EP/PA; 164-f-EJ/EP; 172-b-DE/EP; 173-a-AE/EP/ST; 182-c-EP/ST; 183-c-EP/HH/PA;

Response: *These comments are addressed under Demographics*

The following comments question the psycho-social analysis factor for evacuations:

16-c-EP/PA/PS; 50-q-EP/PS

Response: *These comments are addressed under Psycho-Social Effects*

The following comments express concerns for the lack of planning for the evacuation of Special Facilities:

79-v-EJ/EP/SM; 96-h-EP; 125-b-EP

Response: *These comments are addressed under Environmental Justice*

The following comments express support of the Emergency Planning technical expertise and general support for the evacuation plan:

56-d-EP; 109-b-EC/EP; 146-a-EP/SE; 148-a-AL/SO; 148-b-AL/SO

Response: *The comments are supportive of the emergency management plan at Indian Point, and are general in nature. The comments provide no additional information; therefore, there were no changes made to the supplement.*

A.2.19.7 Comments Related to Terrorism

The following comments express concern regarding either the potential for Indian Point to be a terrorist target or the need for the NRC staff to assess the environmental impacts of such potential attacks:

11-e-RW/ST; 12-e-RW/ST; 13-d-PA/RW/ST; 16-b-PS/ST; 17-b-EP/LI/ST; 17-g-OS/ST; 17-i-SF/ST; 17-k-SF/ST; 17-l-SF/ST; 17-n-EP/PA/ST; 18-b-OE/ST; 20-a-PA/SF/ST; 27-e-SF/ST; 37-b-LE/SF/ST; 38-b-PA/RW/ST; 38-h-ST; 39-d-PA/ST; 50-m-PA/ST; 52-b-ST; 54-b-DE/ST; 61-b-LE/RW/ST; 63-f-RW/ST; 73-h-AM/LR/ST; 75-b-EP/LE/OP/ST; 80-a-EP/OR/RW/ST; 80-b-LE/RW/SF/ST; 87-b-HH/PA/RW/ST; 91-e-OR/RW/ST; 102-d-OW/PA/ST; 110-c-AL/OP/ST; 120-n-ST; 122-a-DE/PA/ST; 126-a-DE/RW/SF/ST; 135-c-RW/SF/ST; 137-d-LR/ST; 137-q-ST; 144-c-ST; 145-b-RW/SF/ST; 160-a-AL/SA/ST; 161-c-RW/ST; 161-g-ST/UF; 161-h-DE/ST; 162-b-AL/SF/ST; 164-a-OE/PA/ST; 171-b-PA/ST; 172-c-ST; 173-a-AE/EP/ST; 176-e-RW/SF/ST; 179-f-SF/RW/ST; 182-c-EP/ST; 183-d-ST

Response: *The issue of security and risk from malevolent acts at nuclear power plants is generally beyond the scope of license renewal. This matter will continue to be addressed through the ongoing regulatory oversight process as current and generic regulatory issues that affect all nuclear facilities. Appropriate safeguards and security measures have been incorporated into the site security and emergency preparedness plans. Any required changes to emergency and safeguards contingency plans related to terrorist events will be incorporated and reviewed under the operating license.*

The NRC's environmental review is confined to environmental impacts related to the extended period of operation. To the extent that these comments urge the NRC staff to consider

environmental impacts of potential terrorist attacks, the Commission's long-standing position is that NEPA does not require inquiry into the consequences of a hypothetical terrorist attack.

In a Memorandum and Order concerning the renewal of the operating license for the Oyster Creek Nuclear Generating Station, Amergen Energy Company, LLC (License Renewal for Oyster Creek Nuclear Generating Station), CLI-07-8, 65 NRC 124 (February 26, 2007), ADAMS Accession No. ML070570511), the Commission stated that it "respectfully . . . disagrees" with the Ninth Circuit Court of Appeals decision in San Luis Obispo Mothers for Peace, v. NRC, 449 F.3d 1016 (9th Cir. 2006) regarding consideration of the potential environmental impacts of terrorist attacks at Diablo Canyon, and will follow the decision of the court as applicable to that proceeding. But, as to other proceedings, the Commission continues to believe that such inquiry is not required.

In the Oyster Creek Memorandum and Order, the Commission also reached the following conclusions. First, terrorist issues are unrelated to "the detrimental effects of aging" and are beyond the scope of license renewal. Second, the environmental effect caused by terrorists is simply too far removed from the natural or expected consequences of agency action to require a study under NEPA. Third, a NEPA-driven review of the risks of terrorism would not be necessary because the NRC has undertaken extensive efforts to enhance security at nuclear facilities. These ongoing post-9/11 enhancements provide the best vehicle for protecting the public. Fourth, substantial practical difficulties impede meaningful NEPA-terrorism review, while the problem of protecting sensitive security information in the quintessentially public NEPA and adjudicatory process presents additional obstacles. Finally, the GEIS documents "a discretionary analysis of terrorist acts in connection with license renewal, and concluded that the core damage and radiological release from such acts would be no worse than the damage and release to be expected from internally initiated events."

No change to the SEIS will be made as a result of these comments.

A.2.19.8 Support for Entergy

The following comments are generally supportive of Entergy:

1-b-EC/SE; 7-a-SE/SL; 8-d-SE/SR; 23-a-SE/SR; 40-xxxxx-SE; 42-d-SE/SR; 42-h-SE/SL; 43-a-SE/SO; 48-a-SE/SO; 48-c-SE; 53-a-SE/SR; 56-c-HH; 56-e-SE; 57-c-SA/SE/SO; 57-h-SE/SR;60-a-SE; 60-b-AQ/SE; 67-e-SE/SO; 109-c-SE/SO; 114-a-SE; 115-a-SA/SE/SO; 119-d-AQ/SE; 119-j-SE/SR; 131-b-SE; 131-c-SE/SR; 131-d-SE; 136-c-SE; 146-a-EP/SE; 148-b-OS/SE; 148-c-SE; 150-a-SA/SE; 150-c-SA/SE; 156-a-SE/SR; 163-a-SE/SO/SR; 181-a-SE/SR

Response: *The comments are in support of Entergy and are general in nature. No new information in provided and therefore, the comments will not be evaluated further. No change to the SEIS will be made as a result of this comment.*

NRC FORM 335
(9-2004)
NRCMD 3.7

U.S. NUCLEAR REGULATORY COMMISSION

BIBLIOGRAPHIC DATA SHEET

(See instructions on the reverse)

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Main Report and Comment Responses

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Washington, DC 20555-0001

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10. SUPPLEMENTARY NOTES

Docket Nos. 05000247 and 05000286, TAC Nos. MD5411 and MD5412

11. ABSTRACT *(200 words or less)*

This supplemental environmental impact statement (SEIS) has been prepared in response to an application submitted to the NRC by Entergy Nuclear Operations, Inc. (Entergy), Entergy Nuclear Indian Point 2, LLC, and Entergy Nuclear Indian Point 3, LLC (all applicants will be jointly referred to as Entergy) to renew the operating licenses for Indian Point Nuclear Generating Unit Nos. 2 and 3 (IP2 and IP3) for an additional 20 years under 10 CFR Part 54, "Requirements for Renewal of Operating Licenses for Nuclear Power Plants." This SEIS includes the NRC staff's analysis which considers and weighs the environmental impacts of the proposed action, the environmental impacts of alternatives to the proposed action, and mitigation measures available for reducing or avoiding adverse impacts. It also includes the NRC staff's recommendation regarding the proposed action.

The NRC staff's recommendation is that the Commission determine that the adverse environmental impacts of license renewals for IP2 and IP3 are not so great that preserving the option of license renewal for energy planning decision makers would be unreasonable. This recommendation is based on (1) the analysis and findings in the GEIS, (2) the environmental report and other information submitted by Entergy, (3) consultation with other Federal, State, Tribal, and local agencies, (4) the NRC staff's own independent review, and (5) the NRC staff's consideration of public comments received during the scoping process and in response to the draft SEIS.

12. KEY WORDS/DESCRIPTORS *(List words or phrases that will assist researchers in locating the report.)*

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IP3
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Supplement to the Generic Environmental Impact Statement
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