From: Mary Richmond
Sent: Wednesday, January 22, 2025 4:13 PM
To: PalisadesRestart-EnvDocsPUBLICem Resource
Subject: PNNL Climate Change Spreadsheet for Palisades
Attachments: Palisades Climate Change Spreadsheet.pdf

Mary C Richmond

Environmental Project Manager

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From: Mary Richmond

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		Land Use						Hydrology						
USGCRP (2014)[1] Climate Change Considerations:		On-site and off-site land disturbance activities	On-site and off-site land use classification conversions resulting from land disturbance activities	On-site and off-site impacts to provisions of any affected local or regional land use or economic development plans	On-site and off-site disruption to land or water resource access	On-site and off-site disruption to existing land uses or private land access	Transmission line corridor maintenance activities during operations affecting land use	Anticipated hydrologic alterations resulting from station building or operation	Effects of anticipated hydrologic alterations to the quantity and availability of water within the region of interest	Effects of plant effluent discharge on water quality of receiving water bodies	Proposed actions to minimize hydrologic alteration effects	Impacts on other water uses and other water users related to changes in water supply reliability due to station building or operation	Impacts on other water uses and other water users related to changes in water quality due to station building or operation	Compliance with applicable water quality and water use standards and regulations
Linked Question		L-1	L-2	L-2	L-3	L-3	L-1	H-1	H-3	H-2	H-1	H-3	H-3	H-4
Climate	Global climate is changing with global warming of past 50 years due primarily to human activities													
Climate	Global climate changes are projected over this century and beyond with the magnitude of changes after the next few decades dependent primarily on global emissions of heat-trapping gases and the sensitivity of the Earth's climate to these emissions													
Climate	Increased temperatures[2]													
Climate	Lengthened growing season[2]													
Climate	Seasonal/annual changes in precipitation amount[2]													
Climate	Changes in frequency & intensity of extreme precipitation events[2]													
Climate	Changes in frequency & intensity of extreme weather events[2,3]													
Climate	Currently experiencing Increased winter storm frequency and intensity with northward shifted storm tracks; other trends in severe storms (tornados, hail, damaging thunderstorms) are uncertain													
Climate	Declining ice volume/surface extent on land, lakes, and sea[2,4]													
Water Resources	Increase in very heavy precipitation events & changes in length of dry spells[2]													
Water Resources	Changes in drought intensity[2]							X			X			
Water Resources	Changes in flood intensity[2]							X			X			
Water Resources	Changes in water demand, groundwater withdrawals & availability, aquifer recharge[2]													
Water Resources	Decreased surface water quality[6]							X		X			X	
Water Resources	Changes in water supply & demand[2]								X			X		

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USGCRP (2014)[1] Climate Change Considerations:		On-site and off-site land disturbance activities	On-site and off-site land use classification conversions resulting from land disturbance activities	On-site and off-site impacts to provisions of any affected local or regional land use or economic development plans	On-site and off-site disruption to land or water resource access	On-site and off-site disruption to existing land uses or private land access	Transmission line corridor maintenance activities during operations affecting land use	Anticipated hydrologic alterations resulting from station building or operation	Effects of anticipated hydrologic alterations to the quantity and availability of water within the region of interest	Effects of plant effluent discharge on water quality of receiving water bodies	Proposed actions to minimize hydrologic alteration effects	Impacts on other water uses and other water users related to changes in water supply reliability due to station building or operation	Impacts on other water uses and other water users related to changes in water quality due to station building or operation	Compliance with applicable water quality and water use standards and regulations
Linked Question		L-1	L-2	L-2	L-3	L-3	L-1	H-1	H-3	H-2	H-1	H-3	H-3	H-4
Water Resources	Reduced surface & groundwater supplies; increased likelihood of water shortages													
Water Resources	Increased flooding risk[7]													
Water Resources	New risks, vulnerabilities, & opportunities may not be properly managed within existing practices													
Water Resources	Institutional, scientific, economic & political barriers to implementing adaptive strategies													
Energy Supply and Use	Effect of extreme weather events on energy facilities & infrastructure													
Energy Supply and Use	Increased summer electricity use & peak loads; decreased winter heating demand; net increase in electricity demand													
Energy Supply and Use	Constraints on energy production due to changes in water availability													
Energy Supply and Use	Changes in future energy mix													
Transportation	Effects on the reliability & capacity of transportation systems[8]													
Transportation	Increased disruption of transportation networks and operations due to extreme weather events[10]													
Transportation	Increased total costs to transportation systems & users													
Agriculture	Increasing climate disruptions to agricultural production[11]													
Agriculture	Changes in crop & livestock production due to climate-induced stresses (weeds, diseases, insect pests, etc.)[2]													
Agriculture	Loss and degradation of agricultural soil & water assets		X											
Agriculture	Negative impacts on crop & livestock productivity due to increased incidence of weather extremes													
Agriculture	Need for increased innovation in agricultural production													
Agriculture	Effects on U.S. & global food security													

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Linked Question		L-1	L-2	L-2	L-3	L-3	L-1	H-1	H-3	H-2	H-1	H-3	H-3	H-4
Forests	Increased vulnerability to ecosystem changes & tree mortality[12]		X											
Forests	Reduced rate of forest CO_2 uptake													
Forests	Influence of bioenergy on forest product markets													
Forests	Changing forest management policies &practices			X										
Ecosystems, Biodiversity, and Ecosystem Services	Reduced ecosystem ability to improve water quality & regulate water flows													
Ecosystems, Biodiversity, and Ecosystem Services	Reduced ecosystem ability to buffer impacts from extreme events (fires, floods, storms, etc.)													
Ecosystems, Biodiversity, and Ecosystem Services	Changing mix of plant and animal life[13]													
Ecosystems, Biodiversity, and Ecosystem Services	Shifts in timing of critical biological events[14]													
Ecosystems, Biodiversity, and Ecosystem Services	Changes in management goals and practices[15]			X										
Human Health	Threats to human health and well-being[16]													
Human Health	Amplification of existing health threats & impacts on vulnerable groups[17]													

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USGCRP (2014)[1] Climate Change Considerations:		On-site and off-site land disturbance activities	On-site and off-site land use classification conversions resulting from land disturbance activities	On-site and off-site impacts to provisions of any affected local or regional land use or economic development plans	On-site and off-site disruption to land or water resource access	On-site and off-site disruption to existing land uses or private land access	Transmission line corridor maintenance activities during operations affecting land use	Anticipated hydrologic alterations resulting from station building or operation	Effects of anticipated hydrologic alterations to the quantity and availability of water within the region of interest	Effects of plant effluent discharge on water quality of receiving water bodies	Proposed actions to minimize hydrologic alteration effects	Impacts on other water uses and other water users related to changes in water supply reliability due to station building or operation	Impacts on other water uses and other water users related to changes in water quality due to station building or operation	Compliance with applicable water quality and water use standards and regulations
Linked Question		L-1	L-2	L-2	L-3	L-3	L-1	H-1	H-3	H-2	H-1	H-3	H-3	H-4
Human Health	Public health actions, and action timing, to protect people from some climate change impacts													
Human Health	Influence of climate change adaptation strategies on human health			X										
Energy, Water & Land Use	Effects on climate change vulnerability & regional adaptation & mitigation options from interaction of energy, water & land systems[2]													
Energy, Water & Land Use	Dependence of energy systems on land & water supplies influencing development of these systems & options for reducing greenhouse gas emissions													
Energy, Water & Land Use	Use of joint resource management considerations in energy, water, & land use to identify & evaluate options for reducing climate change			X										
Urban Systems, Infrastructure, and Vulnerability	Climate change impacts on urban water, energy supply, transportation, & other essential infrastructure													
Urban Systems, Infrastructure, and Vulnerability	Linked disruptions in urban infrastructure systems													
Urban Systems, Infrastructure, and Vulnerability	Influence of social inequalities on urban resident & community climate vulnerability & adaptive capacity													
Urban Systems, Infrastructure, and Vulnerability	Cooperative government & private sector activity in urban adaptation efforts			X										

		Land Use						Hydrology						
USGCRP (2014)[1] Climate Change Considerations:		On-site and off-site land disturbance activities	On-site and off-site land use classification conversions resulting from land disturbance activities	On-site and off-site impacts to provisions of any affected local or regional land use or economic development plans	On-site and off-site disruption to land or water resource access	On-site and off-site disruption to existing land uses or private land access	Transmission line corridor maintenance activities during operations affecting land use	Anticipated hydrologic alterations resulting from station building or operation	Effects of anticipated hydrologic alterations to the quantity and availability of water within the region of interest	Effects of plant effluent discharge on water quality of receiving water bodies	Proposed actions to minimize hydrologic alteration effects	Impacts on other water uses and other water users related to changes in water supply reliability due to station building or operation	Impacts on other water uses and other water users related to changes in water quality due to station building or operation	Compliance with applicable water quality and water use standards and regulations
Linked Question		L-1	L-2	L-2	L-3	L-3	L-1	H-1	H-3	H-2	H-1	H-3	H-3	H-4
Indigenous Peoples, Land, and Resources	Native People's access to traditional foods													
Indigenous Peoples, Land, and Resources	Ability of Native communities to adapt to decreases in water quality & quantity													
Land Use and Land Cover Change	Effects of choices about land-use and land-cover patterns on ecosystems and human communities		X											
Land Use and Land Cover Change	Effects of changes in land-use and land-cover patterns on climate processes													
Land Use and Land Cover Change	Influence of land-use decisions made to adapt to the effects of climate change			X										
Land Use and Land Cover Change	Effect of land use & land management choices on atmospheric greenhouse gas levels													
Rural Communities	Increased impacts of climate change on rural communities and rural economic activities[18]													
Rural Communities	Unique vulnerabilities of rural communities to climate change impacts[19]													
Rural Communities	Limited capacity of rural governments to respond to climate change impacts[20]			X										
Biogeochemical Cycles	Alterations in biogeochemical cycles[21]													
Biogeochemical Cycles	Effect of natural land sinks on carbon, nitrogen, phosphorus, and other biogeochemical cycles													

		Land Use						Hydrology						
USGCRP (2014)[1] Climate Change Considerations:		On-site and off-site land disturbance activities	On-site and off-site land use classification conversions resulting from land disturbance activities	On-site and off-site impacts to provisions of any affected local or regional land use or economic development plans	On-site and off-site disruption to land or water resource access	On-site and off-site disruption to existing land uses or private land access	Transmission line corridor maintenance activities during operations affecting land use	Anticipated hydrologic alterations resulting from station building or operation	Effects of anticipated hydrologic alterations to the quantity and availability of water within the region of interest	Effects of plant effluent discharge on water quality of receiving water bodies	Proposed actions to minimize hydrologic alteration effects	Impacts on other water uses and other water users related to changes in water supply reliability due to station building or operation	Impacts on other water uses and other water users related to changes in water quality due to station building or operation	Compliance with applicable water quality and water use standards and regulations
Linked Question		L-1	L-2	L-2	L-3	L-3	L-1	H-1	H-3	H-2	H-1	H-3	H-3	H-4
Biogeochemical Cycles	Increased vulnerability of biodiversity, food security, human health, and water quality due to altered biogeochemical cycles and climate change													

[1]Entries are grouped by USGCRP sector and are derived from Key Messages in USGRCP (2014) *Climate Change Impacts in the United States: The Third National Climate Assessment* , Melillo, J.M. T.C. Richmond, and G.W. Yohe (eds.), US Global Change Research Program, 841 pp. doi:10.7930/J0Z31WJ2

[2]SMEs should consult the regional section of GCRP (2014) and other appropriate sources for information on the extent and direction of the anticipated changes in the region of interest.

[3]Includes heat waves, cold waves, and regional droughts

[4]Includes projection of summertime Arctic Ocean sea ice essentially disappearing before mid-century

[5]Includes saltwater intrusion and other impacts related to sea level rise, storms and storm surges, and changes in surface and groundwater use patterns

[6]Includes changes due to increasing air and water temperatures, more intense precipitation and runoff, increasing droughts, and increased sediment and pollutant loadings

[7]Includes effects on human safety and health, property, infrastructure, economies, and ecology

[8]Includes impacts from sea level rise, storm surge, extreme weather events, higher temperatures, heat waves, precipitation changes, Arctic warming and other climatic conditions

[9]Includes temporary and permanent flooding of airports, ports and harbors, roads, rail lines, tunnels, and bridges

[10]Includes both transportation interruptions and infrastructure damage (e.g., pavement and track damage) due to extreme heat, strong hurricanes, coastal erosion, permafrost thaw, etc.

[11]Includes increasingly negative impacts on crops and livestock due to responses to elevated CO2, increased temperatures, changes in solar radiation, etc.

[12]Includes effects of fire, insect infestations, drought, disease outbreaks, etc.

[13]Includes shifts in ranges of species; increased incidence of insect pests, disease pathogens, and invasive weed species; effects of hotter and dryer deserts and drylands; impacts of ocean acidification on coastal and near-shore ecosystems; impacts of Arctic summer sea ice loss; impacts of warming on fish, plant, and animal species; etc.

[14]Includes spring bud burst, migration, hibernation, emergence from overwintering, plankton blooms, etc.

[15]Includes whole system management and ecosystem-based adaptation strategies

[16]Includes impacts from increased extreme weather events, wildfire, decreased air quality, threats to mental health, illnesses transmitted by food, water, disease-carriers such as mosquitos and ticks and other etiological agents

[17]Includes children, the elderly, the poor, and some communities of color

[18]Rural economic activities include agriculture, forestry, recreation, etc. Impacts include shifts in locations of such activities.

[19]Vulnerabilities include geographic and demographic obstacles, such as physical isolation, limited economic diversity, higher poverty rates, aging population, etc.

[20]Includes ability to adapt rural transportation, infrastructure, health, and emergency response systems

[21]Includes alterations due to increased atmospheric carbon dioxide and changes in nitrogen, phosphorous, and other elements available to ecosystems

		TERRESTRIAL AND WETLAND ECOLOGY										
USGCRP (2014)[1] Climate Change Considerations:		Effect of facility and landscape maintenance on terrestrial habitats	Effect of drift from cooling towers, evaporation ponds, or other operating facilities on terrestrial species and habitats	Effect of station water features (including cooling ponds and evaporation ponds) on adjoining wetlands and other terrestrial habitats	Effect of using groundwater and/or surface water on terrestrial habitats	Effect of operational noise on terrestrial wildlife and their habitats	Effect of traffic induced by station operations on wildlife	Potential injury to birds and bats colliding with tall structures	Possible effects on terrestrial wildlife from electromagnetic radiation, electric tranmission lines, and other electrical facilities	Coordination with other agencies regarding potential impacts to terrestrial biota	Susceptibility of terrestrial species to stressors from habitat and environmental changes	Presence of disease vectors, nuisance, invasive and introduced animal or plant species onsite or in the vicinity of proposed facility
Linked Question		TW-1	TW-2	TW-3	TW-3	TW-1	TW-1	TW-4	TW-4	TW-5	TW-6	TW-7
Climate	Global climate is changing with global warming of past 50 years due primarily to human activities											
Climate	Global climate changes are projected over this century and beyond with the magnitude of changes after the next few decades dependent primarily on global emissions of heat-trapping gases and the sensitivity of the Earth's climate to these emissions											
Climate	Increased temperatures[2]											
Climate	Lengthened growing season[2]											
Climate	Seasonal/annual changes in precipitation amount[2]											
Climate	Changes in frequency & intensity of extreme precipitation events[2]	X		X								
Climate	Changes in frequency & intensity of extreme weather events[2,3]	X		X								
Climate	Currently experiencing Increased winter storm frequency and intensity with northward shifted storm tracks; other trends in severe storms (tornados, hail, damaging thunderstorms) are uncertain											
Climate	Declining ice volume/surface extent on land, lakes, and sea[2,4]											
Water Resources	Increase in very heavy precipitation events & changes in length of dry spells[2]										X	
Water Resources	Changes in drought intensity[2]											
Water Resources	Changes in flood intensity[2]											
Water Resources	Changes in water demand, groundwater withdrawals & availability, aquifer recharge[2]				X							
Water Resources	Decreased surface water quality[6]				X							
Water Resources	Changes in water supply & demand[2]											

		TERRESTRIAL AND WETLAND ECOLOGY										
USGCRP (2014)[1] Climate Change Considerations:		Effect of facility and landscape maintenance on terrestrial habitats	Effect of drift from cooling towers, evaporation ponds, or other operating facilities on terrestrial species and habitats	Effect of station water features (including cooling ponds and evaporation ponds) on adjoining wetlands and other terrestrial habitats	Effect of using groundwater and/or surface water on terrestrial habitats	Effect of operational noise on terrestrial wildlife and their habitats	Effect of traffic induced by station operations on wildlife	Potential injury to birds and bats colliding with tall structures	Possible effects on terrestrial wildlife from electromagnetic radiation, electric tranmission lines, and other electrical facilities	Coordination with other agencies regarding potential impacts to terrestrial biota	Susceptibility of terrestrial species to stressors from habitat and environmental changes	Presence of disease vectors, nuisance, invasive and introduced animal or plant species onsite or in the vicinity of proposed facility
Linked Question		TW-1	TW-2	TW-3	TW-3	TW-1	TW-1	TW-4	TW-4	TW-5	TW-6	TW-7
Water Resources	Reduced surface & groundwater supplies; increased likelihood of water shortages											
Water Resources	Increased flooding risk[7]											
Water Resources	New risks, vulnerabilities, & opportunities may not be properly managed within existing practices											
Water Resources	Institutional, scientific, economic & political barriers to implementing adaptive strategies											
Energy Supply and Use	Effect of extreme weather events on energy facilities & infrastructure											
Energy Supply and Use	Increased summer electricity use & peak loads; decreased winter heating demand; net increase in electricity demand											
Energy Supply and Use	Constraints on energy production due to changes in water availability											
Energy Supply and Use	Changes in future energy mix											
Transportation	Effects on the reliability & capacity of transportation systems[8]											
Transportation	Increased disruption of transportation networks and operations due to extreme weather events[10]											
Transportation	Increased total costs to transportation systems & users											
Agriculture	Increasing climate disruptions to agricultural production[11]											
Agriculture	Changes in crop & livestock production due to climate-induced stresses (weeds, diseases, insect pests, etc.)[2]											
Agriculture	Loss and degradation of agricultural soil & water assets											
Agriculture	Negative impacts on crop & livestock productivity due to increased incidence of weather extremes											
Agriculture	Need for increased innovation in agricultural production											
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Linked Question		TW-1	TW-2	TW-3	TW-3	TW-1	TW-1	TW-4	TW-4	TW-5	TW-6	TW-7
Forests	Increased vulnerability to ecosystem changes & tree mortality[12]		X								X	X
Forests	Reduced rate of forest CO_2 uptake											
Forests	Influence of bioenergy on forest product markets											
Forests	Changing forest management policies &practices											
Ecosystems, Biodiversity, and Ecosystem Services	Reduced ecosystem ability to improve water quality & regulate water flows											
Ecosystems, Biodiversity, and Ecosystem Services	Reduced ecosystem ability to buffer impacts from extreme events (fires, floods, storms, etc.)											
Ecosystems, Biodiversity, and Ecosystem Services	Changing mix of plant and animal life[13]					X	X	X	X			X
Ecosystems, Biodiversity, and Ecosystem Services	Shifts in timing of critical biological events[14]		X			X	X	X	X		X	X
Ecosystems, Biodiversity, and Ecosystem Services	Changes in management goals and practices[15]									X		
Human Health	Threats to human health and well-being[16]											
Human Health	Amplification of existing health threats & impacts on vulnerable groups[17]											

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Linked Question		TW-1	TW-2	TW-3	TW-3	TW-1	TW-1	TW-4	TW-4	TW-5	TW-6	TW-7
Human Health	Public health actions, and action timing, to protect people from some climate change impacts											
Human Health	Influence of climate change adaptation strategies on human health											
Energy, Water & Land Use	Effects on climate change vulnerability & regional adaptation & mitigation options from interaction of energy, water & land systems[2]											
Energy, Water & Land Use	Dependence of energy systems on land & water supplies influencing development of these systems & options for reducing greenhouse gas emissions											
Energy, Water & Land Use	Use of joint resource management considerations in energy, water, & land use to identify & evaluate options for reducing climate change											
Urban Systems, Infrastructure, and Vulnerability	Climate change impacts on urban water, energy supply, transportation, & other essential infrastructure											
Urban Systems, Infrastructure, and Vulnerability	Linked disruptions in urban infrastructure systems											
Urban Systems, Infrastructure, and Vulnerability	Influence of social inequalities on urban resident & community climate vulnerability & adaptive capacity											
Urban Systems, Infrastructure, and Vulnerability	Cooperative government & private sector activity in urban adaptation efforts											

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Linked Question		TW-1	TW-2	TW-3	TW-3	TW-1	TW-1	TW-4	TW-4	TW-5	TW-6	TW-7
Indigenous Peoples, Land, and Resources	Native People's access to traditional foods											
Indigenous Peoples, Land, and Resources	Ability of Native communities to adapt to decreases in water quality & quantity											
Land Use and Land Cover Change	Effects of choices about land-use and land-cover patterns on ecosystems and human communities											
Land Use and Land Cover Change	Effects of changes in land-use and land-cover patterns on climate processes											
Land Use and Land Cover Change	Influence of land-use decisions made to adapt to the effects of climate change											
Land Use and Land Cover Change	Effect of land use & land management choices on atmospheric greenhouse gas levels											
Rural Communities	Increased impacts of climate change on rural communities and rural economic activities[18]											
Rural Communities	Unique vulnerabilities of rural communities to climate change impacts[19]											
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Biogeochemical Cycles	Alterations in biogeochemical cycles[21]											
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Linked Question		TW-1	TW-2	TW-3	TW-3	TW-1	TW-1	TW-4	TW-4	TW-5	TW-6	TW-7
Biogeochemical Cycles	Increased vulnerability of biodiversity, food security, human health, and water quality due to altered biogeochemical cycles and climate change										X	

		AQUATIC ECOLOGY												
USGCRP (2014)[1] Climate Change Considerations:		Effects of plant consumptive water use on aquatic biota	Susceptibility of aquatic species at specific life-stages to plant cooling system entrainment, entrapment, and impingement	Susceptibility of aquatic species to aquatic stressors from habitat and water quality changes, including physical stresses related to cooling system and fish-return systems	Swimming speed of important aquatic species	Estimated susceptibility and natural survival rates for aquatic species with commercial subsistence or recreational value	Regional standing stocks of important aquatic species potentially affected by station building or operation	NPDES permit requirements	Effects on species and habitats affected by heated plume dynamics and scouring	Ability of important aquatic species to exhibit avoidance behavior to thermal discharge and cold shock at all affected life stages	Presence of disease-causing vectors and nuisance, invasive and introduced aquatic species onsite or in the vicinity of the proposed station	Biological effects to important aquatic species resulting from chemical and/or physical alterations to receiving water body	Adverse effects of transmission and pipeline corridor maintenance practices on aquatic biota	Coordination with other agencies regarding potential impacts to aquatic biota
Linked Question		AQ-1	AQ-1	AQ-2	AQ-2	AQ-2	AQ-2	AQ-5	AQ-2	AQ-2	AQ-3	AQ-4	AQ-1	AQ-5
Climate	Global climate is changing with global warming of past 50 years due primarily to human activities													
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Climate	Declining ice volume/surface extent on land, lakes, and sea[2,4]													
Water Resources	Increase in very heavy precipitation events & changes in length of dry spells[2]								X					
Water Resources	Changes in drought intensity[2]													
Water Resources	Changes in flood intensity[2]													
Water Resources	Changes in water demand, groundwater withdrawals & availability, aquifer recharge[2]	X												
Water Resources	Decreased surface water quality[6]			X		X						X		
Water Resources	Changes in water supply & demand[2]													

		AQUATIC ECOLOGY												
USGCRP (2014)[1] Climate Change Considerations:		Effects of plant consumptive water use on aquatic biota	Susceptibility of aquatic species at specific life-stages to plant cooling system entrainment, entrapment, and impingement	Susceptibility of aquatic species to aquatic stressors from habitat and water quality changes, including physical stresses related to cooling system and fish-return systems	Swimming speed of important aquatic species	Estimated susceptibility and natural survival rates for aquatic species with commercial subsistence or recreational value	Regional standing stocks of important aquatic species potentially affected by station building or operation	NPDES permit requirements	Effects on species and habitats affected by heated plume dynamics and scouring	Ability of important aquatic species to exhibit avoidance behavior to thermal discharge and cold shock at all affected life stages	Presence of disease-causing vectors and nuisance, invasive and introduced aquatic species onsite or in the vicinity of the proposed station	Biological effects to important aquatic species resulting from chemical and/or physical alterations to receiving water body	Adverse effects of transmission and pipeline corridor maintenance practices on aquatic biota	Coordination with other agencies regarding potential impacts to aquatic biota
Linked Question		AQ-1	AQ-1	AQ-2	AQ-2	AQ-2	AQ-2	AQ-5	AQ-2	AQ-2	AQ-3	AQ-4	AQ-1	AQ-5
Water Resources	Reduced surface & groundwater supplies; increased likelihood of water shortages													
Water Resources	Increased flooding risk[7]													
Water Resources	New risks, vulnerabilities, & opportunities may not be properly managed within existing practices										X			
Water Resources	Institutional, scientific, economic & political barriers to implementing adaptive strategies													
Energy Supply and Use	Effect of extreme weather events on energy facilities & infrastructure													
Energy Supply and Use	Increased summer electricity use & peak loads; decreased winter heating demand; net increase in electricity demand													
Energy Supply and Use	Constraints on energy production due to changes in water availability													
Energy Supply and Use	Changes in future energy mix													
Transportation	Effects on the reliability & capacity of transportation systems[8]													
Transportation	Increased disruption of transportation networks and operations due to extreme weather events[10]													
Transportation	Increased total costs to transportation systems & users													
Agriculture	Increasing climate disruptions to agricultural production[11]													
Agriculture	Changes in crop & livestock production due to climate-induced stresses (weeds, diseases, insect pests, etc.)[2]													
Agriculture	Loss and degradation of agricultural soil & water assets													
Agriculture	Negative impacts on crop & livestock productivity due to increased incidence of weather extremes													
Agriculture	Need for increased innovation in agricultural production													
Agriculture	Effects on U.S. & global food security													

		AQUATIC ECOLOGY												
USGCRP (2014)[1] Climate Change Considerations:		Effects of plant consumptive water use on aquatic biota	Susceptibility of aquatic species at specific life-stages to plant cooling system entrainment, entrapment, and impingement	Susceptibility of aquatic species to aquatic stressors from habitat and water quality changes, including physical stresses related to cooling system and fish-return systems	Swimming speed of important aquatic species	Estimated susceptibility and natural survival rates for aquatic species with commercial subsistence or recreational value	Regional standing stocks of important aquatic species potentially affected by station building or operation	NPDES permit requirements	Effects on species and habitats affected by heated plume dynamics and scouring	Ability of important aquatic species to exhibit avoidance behavior to thermal discharge and cold shock at all affected life stages	Presence of disease-causing vectors and nuisance, invasive and introduced aquatic species onsite or in the vicinity of the proposed station	Biological effects to important aquatic species resulting from chemical and/or physical alterations to receiving water body	Adverse effects of transmission and pipeline corridor maintenance practices on aquatic biota	Coordination with other agencies regarding potential impacts to aquatic biota
Linked Question		AQ-1	AQ-1	AQ-2	AQ-2	AQ-2	AQ-2	AQ-5	AQ-2	AQ-2	AQ-3	AQ-4	AQ-1	AQ-5
Forests	Increased vulnerability to ecosystem changes & tree mortality[12]													
Forests	Reduced rate of forest CO_2 uptake													
Forests	Influence of bioenergy on forest product markets													
Forests	Changing forest management policies &practices													
Ecosystems, Biodiversity, and Ecosystem Services	Reduced ecosystem ability to improve water quality & regulate water flows													
Ecosystems, Biodiversity, and Ecosystem Services	Reduced ecosystem ability to buffer impacts from extreme events (fires, floods, storms, etc.)													
Ecosystems, Biodiversity, and Ecosystem Services	Changing mix of plant and animal life[13]	X	X	X		X	X			X	X	X		
Ecosystems, Biodiversity, and Ecosystem Services	Shifts in timing of critical biological events[14]	X	X	X		X	X			X	X	X		
Ecosystems, Biodiversity, and Ecosystem Services	Changes in management goals and practices[15]			X										X
Human Health	Threats to human health and well-being[16]													
Human Health	Amplification of existing health threats & impacts on vulnerable groups[17]													

		AQUATIC ECOLOGY												
USGCRP (2014)[1] Climate Change Considerations:		Effects of plant consumptive water use on aquatic biota	Susceptibility of aquatic species at specific life-stages to plant cooling system entrainment, entrapment, and impingement	Susceptibility of aquatic species to aquatic stressors from habitat and water quality changes, including physical stresses related to cooling system and fish-return systems	Swimming speed of important aquatic species	Estimated susceptibility and natural survival rates for aquatic species with commercial subsistence or recreational value	Regional standing stocks of important aquatic species potentially affected by station building or operation	NPDES permit requirements	Effects on species and habitats affected by heated plume dynamics and scouring	Ability of important aquatic species to exhibit avoidance behavior to thermal discharge and cold shock at all affected life stages	Presence of disease-causing vectors and nuisance, invasive and introduced aquatic species onsite or in the vicinity of the proposed station	Biological effects to important aquatic species resulting from chemical and/or physical alterations to receiving water body	Adverse effects of transmission and pipeline corridor maintenance practices on aquatic biota	Coordination with other agencies regarding potential impacts to aquatic biota
Linked Question		AQ-1	AQ-1	AQ-2	AQ-2	AQ-2	AQ-2	AQ-5	AQ-2	AQ-2	AQ-3	AQ-4	AQ-1	AQ-5
Human Health	Public health actions, and action timing, to protect people from some climate change impacts													
Human Health	Influence of climate change adaptation strategies on human health													
Energy, Water & Land Use	Effects on climate change vulnerability & regional adaptation & mitigation options from interaction of energy, water & land systems[2]													
Energy, Water & Land Use	Dependence of energy systems on land & water supplies influencing development of these systems & options for reducing greenhouse gas emissions													
Energy, Water & Land Use	Use of joint resource management considerations in energy, water, & land use to identify & evaluate options for reducing climate change													
Urban Systems, Infrastructure, and Vulnerability	Climate change impacts on urban water, energy supply, transportation, & other essential infrastructure													
Urban Systems, Infrastructure, and Vulnerability	Linked disruptions in urban infrastructure systems													
Urban Systems, Infrastructure, and Vulnerability	Influence of social inequalities on urban resident & community climate vulnerability & adaptive capacity													
Urban Systems, Infrastructure, and Vulnerability	Cooperative government & private sector activity in urban adaptation efforts													

		AQUATIC ECOLOGY												
USGCRP (2014)[1] Climate Change Considerations:		Effects of plant consumptive water use on aquatic biota	Susceptibility of aquatic species at specific life-stages to plant cooling system entrainment, entrapment, and impingement	Susceptibility of aquatic species to aquatic stressors from habitat and water quality changes, including physical stresses related to cooling system and fish-return systems	Swimming speed of important aquatic species	Estimated susceptibility and natural survival rates for aquatic species with commercial subsistence or recreational value	Regional standing stocks of important aquatic species potentially affected by station building or operation	NPDES permit requirements	Effects on species and habitats affected by heated plume dynamics and scouring	Ability of important aquatic species to exhibit avoidance behavior to thermal discharge and cold shock at all affected life stages	Presence of disease-causing vectors and nuisance, invasive and introduced aquatic species onsite or in the vicinity of the proposed station	Biological effects to important aquatic species resulting from chemical and/or physical alterations to receiving water body	Adverse effects of transmission and pipeline corridor maintenance practices on aquatic biota	Coordination with other agencies regarding potential impacts to aquatic biota
Linked Question		AQ-1	AQ-1	AQ-2	AQ-2	AQ-2	AQ-2	AQ-5	AQ-2	AQ-2	AQ-3	AQ-4	AQ-1	AQ-5
Indigenous Peoples, Land, and Resources	Native People's access to traditional foods													
Indigenous Peoples, Land, and Resources	Ability of Native communities to adapt to decreases in water quality & quantity													
Land Use and Land Cover Change	Effects of choices about land-use and land-cover patterns on ecosystems and human communities													
Land Use and Land Cover Change	Effects of changes in land-use and land-cover patterns on climate processes													
Land Use and Land Cover Change	Influence of land-use decisions made to adapt to the effects of climate change													
Land Use and Land Cover Change	Effect of land use & land management choices on atmospheric greenhouse gas levels													
Rural Communities	Increased impacts of climate change on rural communities and rural economic activities[18]													
Rural Communities	Unique vulnerabilities of rural communities to climate change impacts[19]													
Rural Communities	Limited capacity of rural governments to respond to climate change impacts[20]													
Biogeochemical Cycles	Alterations in biogeochemical cycles[21]													
Biogeochemical Cycles	Effect of natural land sinks on carbon, nitrogen, phosphorus, and other biogeochemical cycles													

		AQUATIC ECOLOGY												
USGCRP (2014)[1] Climate Change Considerations:		Effects of plant consumptive water use on aquatic biota	Susceptibility of aquatic species at specific life-stages to plant cooling system entrainment, entrapment, and impingement	Susceptibility of aquatic species to aquatic stressors from habitat and water quality changes, including physical stresses related to cooling system and fish-return systems	Swimming speed of important aquatic species	Estimated susceptibility and natural survival rates for aquatic species with commercial subsistence or recreational value	Regional standing stocks of important aquatic species potentially affected by station building or operation	NPDES permit requirements	Effects on species and habitats affected by heated plume dynamics and scouring	Ability of important aquatic species to exhibit avoidance behavior to thermal discharge and cold shock at all affected life stages	Presence of disease-causing vectors and nuisance, invasive and introduced aquatic species onsite or in the vicinity of the proposed station	Biological effects to important aquatic species resulting from chemical and/or physical alterations to receiving water body	Adverse effects of transmission and pipeline corridor maintenance practices on aquatic biota	Coordination with other agencies regarding potential impacts to aquatic biota
Linked Question		AQ-1	AQ-1	AQ-2	AQ-2	AQ-2	AQ-2	AQ-5	AQ-2	AQ-2	AQ-3	AQ-4	AQ-1	AQ-5
Biogeochemical Cycles	Increased vulnerability of biodiversity, food security, human health, and water quality due to altered biogeochemical cycles and climate change	X		X										

		SOCIOECONOMICS													ENVIRONMENTAL JUSTICE		
	USGCRP (2014)[1] Climate Change Considerations:	Workforce impacts, including local vs. in-migrating geographic origin of workers and outage impacts	Expected residency patterns during operations	Combined impacts of site employment for sites with an operating station	Impacts of -plant activities on local transportation infrastructure	Impacts of plant activities on local buildings and facilities	Impacts of plant activities to visual resources	Impact of plant activities on local housing resources	Impact of plant activities on public schools	Traffic-related impacts of the site operations workforce and deliveries	Impacts of plant activities to local recreation resources	Impacts of plant activities on first-responder agencies	Expected mitigation actions (traffic, schools, community services)	Employment, income and output impacts attributable to plant activities	Tax revenue impacts attributable to plant activities	Existence of communities exceptionally dependent on subsistence resources	Disproportionate human health impacts of the plant to EJ populations of interest	Effect of plant activities on established resource dependencies, cultural practices, or subsistence behaviors
	Linked Question	S-1	S-1	S-1	S-2	S-1	S-3	S-1	S-1	S-2	S-1	S-1	S-4	S-5	S-5	EJ-1	EJ-2	EJ-3
Climate	Global climate is changing with global warming of past 50 years due primarily to human activities																	
Climate	Global climate changes are projected over this century and beyond with the magnitude of changes after the next few decades dependent primarily on global emissions of heat-trapping gases and the sensitivity of the Earth's climate to these emissions																	
Climate	Increased temperatures[2]																	
Climate	Lengthened growing season[2]																	
Climate	Seasonal/annual changes in precipitation amount[2]																	
Climate	Changes in frequency & intensity of extreme precipitation events[2]																	
Climate	Changes in frequency & intensity of extreme weather events[2,3]																	
Climate	Currently experiencing Increased winter storm frequency and intensity with northward shifted storm tracks; other trends in severe storms (tornados, hail, damaging thunderstorms) are uncertain																	
Climate	Declining ice volume/surface extent on land, lakes, and sea[2,4]																	
Water Resources	Increase in very heavy precipitation events & changes in length of dry spells[2]																	
Water Resources	Changes in drought intensity[2]																	
Water Resources	Changes in flood intensity[2]																	
Water Resources	Changes in water demand, groundwater withdrawals & availability, aquifer recharge[2]																	
Water Resources	Decreased surface water quality[6]										X							
Water Resources	Changes in water supply & demand[2]		X										X					

		SOCIOECONOMICS														ENVIRONMENTAL JUSTICE		
USGCRP (2014)[1] Climate Change Considerations:		Workforce impacts, including local vs. in-migrating geographic origin of workers and outage impacts	Expected residency patterns during operations	Combined impacts of site employment for sites with an operating station	Impacts of -plant activities on local transportation infrastructure	Impacts of plant activities on local buildings and facilities	Impacts of plant activities to visual resources	Impact of plant activities on local housing resources	Impact of plant activities on public schools	Traffic-related impacts of the site operations workforce and deliveries	Impacts of plant activities to local recreation resources	Impacts of plant activities on first-responder agencies	Expected mitigation actions (traffic, schools, community services)	Employment, income and output impacts attributable to plant activities	Tax revenue impacts attributable to plant activities	Existence of communities exceptionally dependent on subsistence resources	Disproportionate human health impacts of the plant to EJ populations of interest	Effect of plant activities on established resource dependencies, cultural practices, or subsistence behaviors
Linked Question		S-1	S-1	S-1	S-2	S-1	S-3	S-1	S-1	S-2	S-1	S-1	S-4	S-5	S-5	EJ-1	EJ-2	EJ-3
Water Resources	Reduced surface & groundwater supplies; increased likelihood of water shortages																	X
Water Resources	Increased flooding risk[7]		X															
Water Resources	New risks, vulnerabilities, & opportunities may not be properly managed within existing practices		X										X					X
Water Resources	Institutional, scientific, economic & political barriers to implementing adaptive strategies												X					X
Energy Supply and Use	Effect of extreme weather events on energy facilities & infrastructure																	
Energy Supply and Use	Increased summer electricity use & peak loads; decreased winter heating demand; net increase in electricity demand			X										X	X			
Energy Supply and Use	Constraints on energy production due to changes in water availability																	
Energy Supply and Use	Changes in future energy mix			X										X	X			
Transportation	Effects on the reliability & capacity of transportation systems[8]				X					X								
Transportation	Increased disruption of transportation networks and operations due to extreme weather events[10]				X					X			X					
Transportation	Increased total costs to transportation systems & users																	X
Agriculture	Increasing climate disruptions to agricultural production[11]																	
Agriculture	Changes in crop & livestock production due to climate-induced stresses (weeds, diseases, insect pests, etc.)[2]																	
Agriculture	Loss and degradation of agricultural soil & water assets															X		X
Agriculture	Negative impacts on crop & livestock productivity due to increased incidence of weather extremes																	
Agriculture	Need for increased innovation in agricultural production																	
Agriculture	Effects on U.S. & global food security																	

		SOCIOECONOMICS														ENVIRONMENTAL JUSTICE		
USGCRP (2014)[1] Climate Change Considerations:		Workforce impacts, including local vs. in-migrating geographic origin of workers and outage impacts	Expected residency patterns during operations	Combined impacts of site employment for sites with an operating station	Impacts of -plant activities on local transportation infrastructure	Impacts of plant activities on local buildings and facilities	Impacts of plant activities to visual resources	Impact of plant activities on local housing resources	Impact of plant activities on public schools	Traffic-related impacts of the site operations workforce and deliveries	Impacts of plant activities to local recreation resources	Impacts of plant activities on first-responder agencies	Expected mitigation actions (traffic, schools, community services)	Employment, income and output impacts attributable to plant activities	Tax revenue impacts attributable to plant activities	Existence of communities exceptionally dependent on subsistence resources	Disproportionate human health impacts of the plant to EJ populations of interest	Effect of plant activities on established resource dependencies, cultural practices, or subsistence behaviors
Linked Question		S-1	S-1	S-1	S-2	S-1	S-3	S-1	S-1	S-2	S-1	S-1	S-4	S-5	S-5	EJ-1	EJ-2	EJ-3
Forests	Increased vulnerability to ecosystem changes & tree mortality[12]																	
Forests	Reduced rate of forest CO_2 uptake																	
Forests	Influence of bioenergy on forest product markets																	
Forests	Changing forest management policies &practices															X		X
Ecosystems, Biodiversity, and Ecosystem Services	Reduced ecosystem ability to improve water quality & regulate water flows																	
Ecosystems, Biodiversity, and Ecosystem Services	Reduced ecosystem ability to buffer impacts from extreme events (fires, floods, storms, etc.)																	
Ecosystems, Biodiversity, and Ecosystem Services	Changing mix of plant and animal life[13]																	
Ecosystems, Biodiversity, and Ecosystem Services	Shifts in timing of critical biological events[14]																	
Ecosystems, Biodiversity, and Ecosystem Services	Changes in management goals and practices[15]																	
Human Health	Threats to human health and well-being[16]		X															
Human Health	Amplification of existing health threats & impacts on vulnerable groups[17]																X	

		SOCIOECONOMICS													ENVIRONMENTAL JUSTICE		
USGCRP (2014)[1] Climate Change Considerations:		Workforce impacts, including local vs. in-migrating geographic origin of workers and outage impacts	Expected residency patterns during operations	Combined impacts of site employment for sites with an operating station	Impacts of -plant activities on local transportation infrastructure	Impacts of plant activities on local buildings and facilities	Impacts of plant activities to visual resources	Impact of plant activities on local housing resources	Impact of plant activities on public schools	Traffic-related impacts of the site operations workforce and deliveries	Impacts of plant activities to local recreation resources	Impacts of plant activities on first-responder agencies	Expected mitigation actions (traffic, schools, community services)	Employment, income and output impacts attributable to plant activities	Tax revenue impacts attributable to plant activities	Existence of communities exceptionally dependent on subsistence resources	Disproportionate human health impacts of the plant to EJ populations of interest	Effect of plant activities on established resource dependencies, cultural practices, or subsistence behaviors
Linked Question		S-1	S-1	S-1	S-2	S-1	S-3	S-1	S-1	S-2	S-1	S-1	S-4	S-5	S-5	EJ-1	EJ-2	EJ-3
Human Health	Public health actions, and action timing, to protect people from some climate change impacts																	
Human Health	Influence of climate change adaptation strategies on human health																	
Energy, Water & Land Use	Effects on climate change vulnerability & regional adaptation & mitigation options from interaction of energy, water & land systems[2]																	
Energy, Water & Land Use	Dependence of energy systems on land & water supplies influencing development of these systems & options for reducing greenhouse gas emissions																	
Energy, Water & Land Use	Use of joint resource management considerations in energy, water, & land use to identify & evaluate options for reducing climate change												X					
Urban Systems, Infrastructure, and Vulnerability	Climate change impacts on urban water, energy supply, transportation, & other essential infrastructure		X										X					X
Urban Systems, Infrastructure, and Vulnerability	Linked disruptions in urban infrastructure systems																	X
Urban Systems, Infrastructure, and Vulnerability	Influence of social inequalities on urban resident & community climate vulnerability & adaptive capacity																	X
Urban Systems, Infrastructure, and Vulnerability	Cooperative government & private sector activity in urban adaptation efforts												X					

		SOCIOECONOMICS														ENVIRONMENTAL JUSTICE		
USGCRP (2014)[1] Climate Change Considerations:		Workforce impacts, including local vs. in-migrating geographic origin of workers and outage impacts	Expected residency patterns during operations	Combined impacts of site employment for sites with an operating station	Impacts of -plant activities on local transportation infrastructure	Impacts of plant activities on local buildings and facilities	Impacts of plant activities to visual resources	Impact of plant activities on local housing resources	Impact of plant activities on public schools	Traffic-related impacts of the site operations workforce and deliveries	Impacts of plant activities to local recreation resources	Impacts of plant activities on first-responder agencies	Expected mitigation actions (traffic, schools, community services)	Employment, income and output impacts attributable to plant activities	Tax revenue impacts attributable to plant activities	Existence of communities exceptionally dependent on subsistence resources	Disproportionate human health impacts of the plant to EJ populations of interest	Effect of plant activities on established resource dependencies, cultural practices, or subsistence behaviors
Linked Question		S-1	S-1	S-1	S-2	S-1	S-3	S-1	S-1	S-2	S-1	S-1	S-4	S-5	S-5	EJ-1	EJ-2	EJ-3
Indigenous Peoples, Land, and Resources	Native People's access to traditional foods															X		
Indigenous Peoples, Land, and Resources	Ability of Native communities to adapt to decreases in water quality & quantity																	X
Land Use and Land Cover Change	Effects of choices about land-use and land-cover patterns on ecosystems and human communities												X					
Land Use and Land Cover Change	Effects of changes in land-use and land-cover patterns on climate processes																	
Land Use and Land Cover Change	Influence of land-use decisions made to adapt to the effects of climate change		X										X					X
Land Use and Land Cover Change	Effect of land use & land management choices on atmospheric greenhouse gas levels																	
Rural Communities	Increased impacts of climate change on rural communities and rural economic activities[18]		X										X		X			
Rural Communities	Unique vulnerabilities of rural communities to climate change impacts[19]												X					X
Rural Communities	Limited capacity of rural governments to respond to climate change impacts[20]				X			X	X	X	X	X	X		X			
Biogeochemical Cycles	Alterations in biogeochemical cycles[21]																	
Biogeochemical Cycles	Effect of natural land sinks on carbon, nitrogen, phosphorus, and other biogeochemical cycles																	

		SOCIOECONOMICS													ENVIRONMENTAL JUSTICE		
USGCRP (2014)[1] Climate Change Considerations:		Workforce impacts, including local vs. in-migrating geographic origin of workers and outage impacts	Expected residency patterns during operations	Combined impacts of site employment for sites with an operating station	Impacts of -plant activities on local transportation infrastructure	Impacts of plant activities on local buildings and facilities	Impacts of plant activities to visual resources	Impact of plant activities on local housing resources	Impact of plant activities on public schools	Traffic-related impacts of the site operations workforce and deliveries	Impacts of plant activities to local recreation resources	Impacts of plant activities on first-responder agencies	Expected mitigation actions (traffic, schools, community services)	Employment, income and output impacts attributable to plant activities	Tax revenue impacts attributable to plant activities	Existence of communities exceptionally dependent on subsistence resources	Disproportionate human health impacts of the plant to EJ populations of interest	Effect of plant activities on established resource dependencies, cultural practices, or subsistence behaviors
Linked Question		S-1	S-1	S-1	S-2	S-1	S-3	S-1	S-1	S-2	S-1	S-1	S-4	S-5	S-5	EJ-1	EJ-2	EJ-3
Biogeochemical Cycles	Increased vulnerability of biodiversity, food security, human health, and water quality due to altered biogeochemical cycles and climate change																	

		HISTORIC AND CULTURAL RESOURCES		METEOROLOGY	AIR QUALITY		NONRADIOLOGICAL HEALTH					RADIOLOGICAL IMPACTS					
USGCRP (2014)[1] Climate Change Considerations:		Operations and maintenance activities affecting onsite historic properties	Operations and maintenance activities affecting offsite historic properties	Cooling system impacts, including plume lengths, additional hours of fogging and icing, salt deposition, increases in humidity and precipitation (including snowfall), potential local weather modification from cloud formation/shadowing, and interactions of plume with other pollutant sources	Sources and types of air emissions	Estimates of annual air emissions for criteria air pollutants, both from the operating plant and from transmission lines	Presence of etiological agents from operations systems and activities that may impact human health	Noise impacts associated with operations	Acute effects of electromagnetic fields (electric shock) associated with transmission lines	Occupational health risks	Potential health impacts related to nonradiological traffic-related accidents for operations and outage	Environmental pathways by which humans can be exposed to radiation (including that from gaseous effluents, liquid effluents, and direct exposure) from an operating facility.	Environmental pathways by which non-human biota can be exposed to radiation (including that from gaseous effluents, liquid effluents, and direct exposure) from an operating facility.	Estimates of the maximum individual radiation dose and total collective radiation doses to the population living in the area of interest	Estimates of the annual occupation radiation dose to workers	Radiological impacts to biota other than humans	Radiological environmental monitoring program for the site
Linked Question		H&CR-1	H&CR-1	M-1	AirQ-1	AirQ-1	NR-1	NR-2	NR-3	NR-4	NR-5	R-1	R-2	R-3	R-3	R-4	R-5
Climate	Global climate is changing with global warming of past 50 years due primarily to human activities																
Climate	Global climate changes are projected over this century and beyond with the magnitude of changes after the next few decades dependent primarily on global emissions of heat-trapping gases and the sensitivity of the Earth's climate to these emissions																
Climate	Increased temperatures[2]			X													
Climate	Lengthened growing season[2]																
Climate	Seasonal/annual changes in precipitation amount[2]			X													
Climate	Changes in frequency & intensity of extreme precipitation events[2]			X													
Climate	Changes in frequency & intensity of extreme weather events[2,3]	X	X	X	X	X											
Climate	Currently experiencing Increased winter storm frequency and intensity with northward shifted storm tracks; other trends in severe storms (tornados, hail, damaging thunderstorms) are uncertain																
Climate	Declining ice volume/surface extent on land, lakes, and sea[2,4]																
Water Resources	Increase in very heavy precipitation events & changes in length of dry spells[2]			X													
Water Resources	Changes in drought intensity[2]																
Water Resources	Changes in flood intensity[2]	X	X														
Water Resources	Changes in water demand, groundwater withdrawals & availability, aquifer recharge[2]																
Water Resources	Decreased surface water quality[6]												X			X	X

		HISTORIC AND CULTURAL RESOURCES		METEOROLOGY	AIR QUALITY		NONRADIOLOGICAL HEALTH					RADIOLOGICAL IMPACTS					
USGCRP (2014)[1] Climate Change Considerations:		Operations and maintenance activities affecting onsite historic properties	Operations and maintenance activities affecting offsite historic properties	Cooling system impacts, including plume lengths, additional hours of fogging and icing, salt deposition, increases in humidity and precipitation (including snowfall), potential local weather modification from cloud formation/shadowing, and interactions of plume with other pollutant sources	Sources and types of air emissions	Estimates of annual air emissions for criteria air pollutants, both from the operating plant and from transmission lines	Presence of etiological agents from operations systems and activities that may impact human health	Noise impacts associated with operations	Acute effects of electromagnetic fields (electric shock) associated with transmission lines	Occupational health risks	Potential health impacts related to nonradiological traffic-related accidents for operations and outage	Environmental pathways by which humans can be exposed to radiation (including that from gaseous effluents, liquid effluents, and direct exposure) from an operating facility.	Environmental pathways by which non-human biota can be exposed to radiation (including that from gaseous effluents, liquid effluents, and direct exposure) from an operating facility.	Estimates of the maximum individual radiation dose and total collective radiation doses to the population living in the area of interest	Estimates of the annual occupation radiation dose to workers	Radiological impacts to biota other than humans	Radiological environmental monitoring program for the site
Linked Question		H&CR-1	H&CR-1	M-1	AirQ-1	AirQ-1	NR-1	NR-2	NR-3	NR-4	NR-5	R-1	R-2	R-3	R-3	R-4	R-5
Water Resources	Changes in water supply & demand[2]												X			X	X
Water Resources	Reduced surface & groundwater supplies; increased likelihood of water shortages												X			X	X
Water Resources	Increased flooding risk[7]	X	X		X	X				X							
Water Resources	New risks, vulnerabilities, & opportunities may not be properly managed within existing practices																
Water Resources	Institutional, scientific, economic & political barriers to implementing adaptive strategies																
Energy Supply and Use	Effect of extreme weather events on energy facilities & infrastructure				X	X			X								
Energy Supply and Use	Increased summer electricity use & peak loads; decreased winter heating demand; net increase in electricity demand																
Energy Supply and Use	Constraints on energy production due to changes in water availability																
Energy Supply and Use	Changes in future energy mix																
Transportation	Effects on the reliability & capacity of transportation systems[8]										X						
Transportation	Increased disruption of transportation networks and operations due to extreme weather events[10]				X	X					X						
Transportation	Increased total costs to transportation systems & users										X						
Agriculture	Increasing climate disruptions to agricultural production[11]																
Agriculture	Changes in crop & livestock production due to climate-induced stresses (weeds, diseases, insect pests, etc.)[2]																
Agriculture	Loss and degradation of agricultural soil & water assets																

		HISTORIC AND CULTURAL RESOURCES		METEOROLOGY	AIR QUALITY		NONRADIOLOGICAL HEALTH					RADIOLOGICAL IMPACTS					
USGCRP (2014)[1] Climate Change Considerations:		Operations and maintenance activities affecting onsite historic properties	Operations and maintenance activities affecting offsite historic properties	Cooling system impacts, including plume lengths, additional hours of fogging and icing, salt deposition, increases in humidity and precipitation (including snowfall), potential local weather modification from cloud formation/shadowing, and interactions of plume with other pollutant sources	Sources and types of air emissions	Estimates of annual air emissions for criteria air pollutants, both from the operating plant and from transmission lines	Presence of etiological agents from operations systems and activities that may impact human health	Noise impacts associated with operations	Acute effects of electromagnetic fields (electric shock) associated with transmission lines	Occupational health risks	Potential health impacts related to nonradiological traffic-related accidents for operations and outage	Environmental pathways by which humans can be exposed to radiation (including that from gaseous effluents, liquid effluents, and direct exposure) from an operating facility.	Environmental pathways by which non-human biota can be exposed to radiation (including that from gaseous effluents, liquid effluents, and direct exposure) from an operating facility.	Estimates of the maximum individual radiation dose and total collective radiation doses to the population living in the area of interest	Estimates of the annual occupation radiation dose to workers	Radiological impacts to biota other than humans	Radiological environmental monitoring program for the site
Linked Question		H&CR-1	H&CR-1	M-1	AirQ-1	AirQ-1	NR-1	NR-2	NR-3	NR-4	NR-5	R-1	R-2	R-3	R-3	R-4	R-5
Agriculture	Negative impacts on crop & livestock productivity due to increased incidence of weather extremes																
Agriculture	Need for increased innovation in agricultural production																
Agriculture	Effects on U.S. & global food security																
Forests	Increased vulnerability to ecosystem changes & tree mortality[12]																
Forests	Reduced rate of forest CO_2 uptake																
Forests	Influence of bioenergy on forest product markets																
Forests	Changing forest management policies &practices																
Ecosystems, Biodiversity, and Ecosystem Services	Reduced ecosystem ability to improve water quality & regulate water flows																
Ecosystems, Biodiversity, and Ecosystem Services	Reduced ecosystem ability to buffer impacts from extreme events (fires, floods, storms, etc.)																
Ecosystems, Biodiversity, and Ecosystem Services	Changing mix of plant and animal life[13]																X
Ecosystems, Biodiversity, and Ecosystem Services	Shifts in timing of critical biological events[14]																

		HISTORIC AND CULTURAL RESOURCES		METEOROLOGY	AIR QUALITY		NONRADIOLOGICAL HEALTH					RADIOLOGICAL IMPACTS					
USGCRP (2014)[1] Climate Change Considerations:		Operations and maintenance activities affecting onsite historic properties	Operations and maintenance activities affecting offsite historic properties	Cooling system impacts, including plume lengths, additional hours of fogging and icing, salt deposition, increases in humidity and precipitation (including snowfall), potential local weather modification from cloud formation/shadowing, and interactions of plume with other pollutant sources	Sources and types of air emissions	Estimates of annual air emissions for criteria air pollutants, both from the operating plant and from transmission lines	Presence of etiological agents from operations systems and activities that may impact human health	Noise impacts associated with operations	Acute effects of electromagnetic fields (electric shock) associated with transmission lines	Occupational health risks	Potential health impacts related to nonradiological traffic-related accidents for operations and outage	Environmental pathways by which humans can be exposed to radiation (including that from gaseous effluents, liquid effluents, and direct exposure) from an operating facility.	Environmental pathways by which non-human biota can be exposed to radiation (including that from gaseous effluents, liquid effluents, and direct exposure) from an operating facility.	Estimates of the maximum individual radiation dose and total collective radiation doses to the population living in the area of interest	Estimates of the annual occupation radiation dose to workers	Radiological impacts to biota other than humans	Radiological environmental monitoring program for the site
Linked Question		H&CR-1	H&CR-1	M-1	AirQ-1	AirQ-1	NR-1	NR-2	NR-3	NR-4	NR-5	R-1	R-2	R-3	R-3	R-4	R-5
Ecosystems, Biodiversity, and Ecosystem Services	Changes in management goals and practices[15]																
Human Health	Threats to human health and well-being[16]						X			X							
Human Health	Amplification of existing health threats & impacts on vulnerable groups[17]									X							
Human Health	Public health actions, and action timing, to protect people from some climate change impacts						X										
Human Health	Influence of climate change adaptation strategies on human health						X			X							
Energy, Water & Land Use	Effects on climate change vulnerability & regional adaptation & mitigation options from interaction of energy, water & land systems[2]																
Energy, Water & Land Use	Dependence of energy systems on land & water supplies influencing development of these systems & options for reducing greenhouse gas emissions																
Energy, Water & Land Use	Use of joint resource management considerations in energy, water, & land use to identify & evaluate options for reducing climate change																
Urban Systems, Infrastructure, and Vulnerability	Climate change impacts on urban water, energy supply, transportation, & other essential infrastructure																
Urban Systems, Infrastructure, and Vulnerability	Linked disruptions in urban infrastructure systems																

		HISTORIC AND CULTURAL RESOURCES		METEOROLOGY	AIR QUALITY		NONRADIOLOGICAL HEALTH					RADIOLOGICAL IMPACTS					
USGCRP (2014)[1] Climate Change Considerations:		Operations and maintenance activities affecting onsite historic properties	Operations and maintenance activities affecting offsite historic properties	Cooling system impacts, including plume lengths, additional hours of fogging and icing, salt deposition, increases in humidity and precipitation (including snowfall), potential local weather modification from cloud formation/shadowing, and interactions of plume with other pollutant sources	Sources and types of air emissions	Estimates of annual air emissions for criteria air pollutants, both from the operating plant and from transmission lines	Presence of etiological agents from operations systems and activities that may impact human health	Noise impacts associated with operations	Acute effects of electromagnetic fields (electric shock) associated with transmission lines	Occupational health risks	Potential health impacts related to nonradiological traffic-related accidents for operations and outage	Environmental pathways by which humans can be exposed to radiation (including that from gaseous effluents, liquid effluents, and direct exposure) from an operating facility.	Environmental pathways by which non-human biota can be exposed to radiation (including that from gaseous effluents, liquid effluents, and direct exposure) from an operating facility.	Estimates of the maximum individual radiation dose and total collective radiation doses to the population living in the area of interest	Estimates of the annual occupation radiation dose to workers	Radiological impacts to biota other than humans	Radiological environmental monitoring program for the site
Linked Question		H&CR-1	H&CR-1	M-1	AirQ-1	AirQ-1	NR-1	NR-2	NR-3	NR-4	NR-5	R-1	R-2	R-3	R-3	R-4	R-5
Urban Systems, Infrastructure, and Vulnerability	Influence of social inequalities on urban resident & community climate vulnerability & adaptive capacity																
Urban Systems, Infrastructure, and Vulnerability	Cooperative government & private sector activity in urban adaptation efforts																
Indigenous Peoples, Land, and Resources	Native People's access to traditional foods	X	X									X		X	X	X	X
Indigenous Peoples, Land, and Resources	Ability of Native communities to adapt to decreases in water quality & quantity	X	X				X										
Land Use and Land Cover Change	Effects of choices about land-use and land-cover patterns on ecosystems and human communities																X
Land Use and Land Cover Change	Effects of changes in land-use and land-cover patterns on climate processes																X
Land Use and Land Cover Change	Influence of land-use decisions made to adapt to the effects of climate change							X									
Land Use and Land Cover Change	Effect of land use & land management choices on atmospheric greenhouse gas levels																

		HISTORIC AND CULTURAL RESOURCES		METEOROLOGY	AIR QUALITY		NONRADIOLOGICAL HEALTH					RADIOLOGICAL IMPACTS					
USGCRP (2014)[1] Climate Change Considerations:		Operations and maintenance activities affecting onsite historic properties	Operations and maintenance activities affecting offsite historic properties	Cooling system impacts, including plume lengths, additional hours of fogging and icing, salt deposition, increases in humidity and precipitation (including snowfall), potential local weather modification from cloud formation/shadowing, and interactions of plume with other pollutant sources	Sources and types of air emissions	Estimates of annual air emissions for criteria air pollutants, both from the operating plant and from transmission lines	Presence of etiological agents from operations systems and activities that may impact human health	Noise impacts associated with operations	Acute effects of electromagnetic fields (electric shock) associated with transmission lines	Occupational health risks	Potential health impacts related to nonradiological traffic-related accidents for operations and outage	Environmental pathways by which humans can be exposed to radiation (including that from gaseous effluents, liquid effluents, and direct exposure) from an operating facility.	Environmental pathways by which non-human biota can be exposed to radiation (including that from gaseous effluents, liquid effluents, and direct exposure) from an operating facility.	Estimates of the maximum individual radiation dose and total collective radiation doses to the population living in the area of interest	Estimates of the annual occupation radiation dose to workers	Radiological impacts to biota other than humans	Radiological environmental monitoring program for the site
Linked Question		H&CR-1	H&CR-1	M-1	AirQ-1	AirQ-1	NR-1	NR-2	NR-3	NR-4	NR-5	R-1	R-2	R-3	R-3	R-4	R-5
Rural Communities	Increased impacts of climate change on rural communities and rural economic activities[18]																
Rural Communities	Unique vulnerabilities of rural communities to climate change impacts[19]																
Rural Communities	Limited capacity of rural governments to respond to climate change impacts[20]																
Biogeochemical Cycles	Alterations in biogeochemical cycles[21]																
Biogeochemical Cycles	Effect of natural land sinks on carbon, nitrogen, phosphorus, and other biogeochemical cycles																
Biogeochemical Cycles	Increased vulnerability of biodiversity, food security, human health, and water quality due to altered biogeochemical cycles and climate change						X										

		NONRADIOACTIVE WASTE IMPACTS	ACCIDENTS			TRANSPORTATION OF RAD MATERIALS (6.1.8)
USGCRP (2014)[1] Climate Change Considerations:		Environmental impacts resulting from the generation and disposal of nonradioactive waste and mixed waste	Estimates of dose consequences at the proposed exclusion area boundary (EAB) and the low-population zone (LPZ) from postulated design basis accidents (DBAs)	Mean estimates of site-specific severe accident risks, considering relevant environmental pathways including the air, ground, food, surface water, and ground water. Risk considerations include individual, population, economic, and contaminated land area risks.	Estimated cost, risk reduction, and value-impact ratios for the selected severe accident mitigation alternatives (SAMAs).	Radiological dose to the population in the region of interest due to transportation of radioactive materials
Linked Question		NRW-1	ACC-1	ACC-2	ACC-3	T-1
Climate	Global climate is changing with global warming of past 50 years due primarily to human activities					
Climate	Global climate changes are projected over this century and beyond with the magnitude of changes after the next few decades dependent primarily on global emissions of heat-trapping gases and the sensitivity of the Earth's climate to these emissions					
Climate	Increased temperatures[2]		X	X	X	
Climate	Lengthened growing season[2]					
Climate	Seasonal/annual changes in precipitation amount[2]		X	X	X	
Climate	Changes in frequency & intensity of extreme precipitation events[2]		X	X	X	
Climate	Changes in frequency & intensity of extreme weather events[2,3]		X	X	X	
Climate	Currently experiencing Increased winter storm frequency and intensity with northward shifted storm tracks; other trends in severe storms (tornados, hail, damaging thunderstorms) are uncertain					
Climate	Declining ice volume/surface extent on land, lakes, and sea[2,4]					
Water Resources	Increase in very heavy precipitation events & changes in length of dry spells[2]		X	X	X	
Water Resources	Changes in drought intensity[2]					
Water Resources	Changes in flood intensity[2]			X	X	
Water Resources	Changes in water demand, groundwater withdrawals & availability, aquifer recharge[2]					
Water Resources	Decreased surface water quality[6]					
Water Resources	Changes in water supply & demand[2]			X	X	

		NONRADIOACTIVE WASTE IMPACTS	ACCIDENTS			TRANSPORTATION OF RAD MATERIALS (6.1.8)
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Linked Question		NRW-1	ACC-1	ACC-2	ACC-3	T-1
Water Resources	Reduced surface & groundwater supplies; increased likelihood of water shortages					
Water Resources	Increased flooding risk[7]			X	X	
Water Resources	New risks, vulnerabilities, & opportunities may not be properly managed within existing practices					
Water Resources	Institutional, scientific, economic & political barriers to implementing adaptive strategies					
Energy Supply and Use	Effect of extreme weather events on energy facilities & infrastructure					
Energy Supply and Use	Increased summer electricity use & peak loads; decreased winter heating demand; net increase in electricity demand					
Energy Supply and Use	Constraints on energy production due to changes in water availability					
Energy Supply and Use	Changes in future energy mix					
Transportation	Effects on the reliability & capacity of transportation systems[8]			X	X	
Transportation	Increased disruption of transportation networks and operations due to extreme weather events[10]					X
Transportation	Increased total costs to transportation systems & users					
Agriculture	Increasing climate disruptions to agricultural production[11]			X	X	
Agriculture	Changes in crop & livestock production due to climate-induced stresses (weeds, diseases, insect pests, etc.)[2]					
Agriculture	Loss and degradation of agricultural soil & water assets					
Agriculture	Negative impacts on crop & livestock productivity due to increased incidence of weather extremes			X	X	
Agriculture	Need for increased innovation in agricultural production					
Agriculture	Effects on U.S. & global food security					

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Linked Question		NRW-1	ACC-1	ACC-2	ACC-3	T-1
Forests	Increased vulnerability to ecosystem changes & tree mortality[12]					
Forests	Reduced rate of forest CO_2 uptake					
Forests	Influence of bioenergy on forest product markets					
Forests	Changing forest management policies &practices					
Ecosystems, Biodiversity, and Ecosystem Services	Reduced ecosystem ability to improve water quality & regulate water flows					
Ecosystems, Biodiversity, and Ecosystem Services	Reduced ecosystem ability to buffer impacts from extreme events (fires, floods, storms, etc.)					
Ecosystems, Biodiversity, and Ecosystem Services	Changing mix of plant and animal life[13]			X	X	
Ecosystems, Biodiversity, and Ecosystem Services	Shifts in timing of critical biological events[14]					
Ecosystems, Biodiversity, and Ecosystem Services	Changes in management goals and practices[15]					
Human Health	Threats to human health and well-being[16]					
Human Health	Amplification of existing health threats & impacts on vulnerable groups[17]					

		NONRADIOACTIVE WASTE IMPACTS	ACCIDENTS			TRANSPORTATION OF RAD MATERIALS (6.1.8)
USGCRP (2014)[1] Climate Change Considerations:		Environmental impacts resulting from the generation and disposal of nonradioactive waste and mixed waste	Estimates of dose consequences at the proposed exclusion area boundary (EAB) and the low-population zone (LPZ) from postulated design basis accidents (DBAs)	Mean estimates of site-specific severe accident risks, considering relevant environmental pathways including the air, ground, food, surface water, and ground water. Risk considerations include individual, population, economic, and contaminated land area risks.	Estimated cost, risk reduction, and value-impact ratios for the selected severe accident mitigation alternatives (SAMAs).	Radiological dose to the population in the region of interest due to transportation of radioactive materials
Linked Question		NRW-1	ACC-1	ACC-2	ACC-3	T-1
Human Health	Public health actions, and action timing, to protect people from some climate change impacts					
Human Health	Influence of climate change adaptation strategies on human health					
Energy, Water & Land Use	Effects on climate change vulnerability & regional adaptation & mitigation options from interaction of energy, water & land systems[2]					
Energy, Water & Land Use	Dependence of energy systems on land & water supplies influencing development of these systems & options for reducing greenhouse gas emissions					
Energy, Water & Land Use	Use of joint resource management considerations in energy, water, & land use to identify & evaluate options for reducing climate change					
Urban Systems, Infrastructure, and Vulnerability	Climate change impacts on urban water, energy supply, transportation, & other essential infrastructure					
Urban Systems, Infrastructure, and Vulnerability	Linked disruptions in urban infrastructure systems					
Urban Systems, Infrastructure, and Vulnerability	Influence of social inequalities on urban resident & community climate vulnerability & adaptive capacity					
Urban Systems, Infrastructure, and Vulnerability	Cooperative government & private sector activity in urban adaptation efforts					

		NONRADIOACTIVE WASTE IMPACTS	ACCIDENTS			TRANSPORTATION OF RAD MATERIALS (6.1.8)
USGCRP (2014)[1] Climate Change Considerations:		Environmental impacts resulting from the generation and disposal of nonradioactive waste and mixed waste	Estimates of dose consequences at the proposed exclusion area boundary (EAB) and the low-population zone (LPZ) from postulated design basis accidents (DBAs)	Mean estimates of site-specific severe accident risks, considering relevant environmental pathways including the air, ground, food, surface water, and ground water. Risk considerations include individual, population, economic, and contaminated land area risks.	Estimated cost, risk reduction, and value-impact ratios for the selected severe accident mitigation alternatives (SAMAs).	Radiological dose to the population in the region of interest due to transportation of radioactive materials
Linked Question		NRW-1	ACC-1	ACC-2	ACC-3	T-1
Indigenous Peoples, Land, and Resources	Native People's access to traditional foods					
Indigenous Peoples, Land, and Resources	Ability of Native communities to adapt to decreases in water quality & quantity					
Land Use and Land Cover Change	Effects of choices about land-use and land-cover patterns on ecosystems and human communities			X	X	
Land Use and Land Cover Change	Effects of changes in land-use and land-cover patterns on climate processes					
Land Use and Land Cover Change	Influence of land-use decisions made to adapt to the effects of climate change	X				
Land Use and Land Cover Change	Effect of land use & land management choices on atmospheric greenhouse gas levels					
Rural Communities	Increased impacts of climate change on rural communities and rural economic activities[18]					
Rural Communities	Unique vulnerabilities of rural communities to climate change impacts[19]					
Rural Communities	Limited capacity of rural governments to respond to climate change impacts[20]					
Biogeochemical Cycles	Alterations in biogeochemical cycles[21]					
Biogeochemical Cycles	Effect of natural land sinks on carbon, nitrogen, phosphorus, and other biogeochemical cycles					

		NONRADIOACTIVE WASTE IMPACTS	ACCIDENTS			TRANSPORTATION OF RAD MATERIALS (6.1.8)
USGCRP (2014)[1] Climate Change Considerations:		Environmental impacts resulting from the generation and disposal of nonradioactive waste and mixed waste	Estimates of dose consequences at the proposed exclusion area boundary (EAB) and the low-population zone (LPZ) from postulated design basis accidents (DBAs)	Mean estimates of site-specific severe accident risks, considering relevant environmental pathways including the air, ground, food, surface water, and ground water. Risk considerations include individual, population, economic, and contaminated land area risks.	Estimated cost, risk reduction, and value-impact ratios for the selected severe accident mitigation alternatives (SAMAs).	Radiological dose to the population in the region of interest due to transportation of radioactive materials
Linked Question		NRW-1	ACC-1	ACC-2	ACC-3	T-1
Biogeochemical Cycles	Increased vulnerability of biodiversity, food security, human health, and water quality due to altered biogeochemical cycles and climate change					

CATEGORY	RESOURCE AREA & LINKED QUESTION NUMBER	QUESTION
LAND USE	L-1	Are expected climatological changes likely to affect impacts related to on-site, off-site, and/or transmission line corridor land disturbance activities?
LAND USE	L-2	Are expected climatological changes likely to influence, or lead to, any plant impacts on local/regional land use classifications or economic development plans?
LAND USE	L-3	Are expected climatological changes likely to influence, or lead to, any plant impacts found to disrupt access to land or water resources or to affect existing land uses or private land access?
LAND USE	Overall Influence of Climate Change on Land Use Impacts	Will expected climatological changes affect the land use building or operational impact levels assigned in Chapters 3 and 4? Potential changes to the building impact level could occur if there are long-term, persistent impacts from building activities. Considering responses to previous questions, justify your answer in 4 sentences or less.
HYDROLOGY	H-1	Will expected climatological changes affect the anticipated hydrologic alterations resulting from station building or operation?
HYDROLOGY	H-2	Will expected climatological changes influence, or lead to, plant effluent discharges impacting the water quality of receiving water bodies?
HYDROLOGY	H-3	Will expected climatological changes influence, or lead to, plant impacts to other water uses and other water users?
HYDROLOGY	H-4	As climate changes, will plant hydrological impacts affect the ability of the region to meet applicable water quality and water use standards and regulations?
HYDROLOGY	Overall Influence of Climate Change on Hydrology Impacts	Will expected climatological changes affect the hydrology building or operational impact levels assigned in Chapters 3 and 4? Potential changes to the building impact level could occur if there are long-term, persistent impacts from building activities. Considering responses to previous questions, justify your answer in 4 sentences or less.
TERRESTRIAL ECOLOGY & WETLANDS	TW-1	Will expected climatological changes affect plant impacts from facility and landscape maintenance, noise, and traffic on terrestrial habitats and wildlife?
TERRESTRIAL ECOLOGY & WETLANDS	TW-2	Will expected climatological changes affect the impact of drift from plant facilities on terrestrial habitats, wetlands, and species?
TERRESTRIAL ECOLOGY & WETLANDS	TW-3	Will expected climatological changes affect the impact of the plant (including the operation of cooling and evaporation ponds, and the use of groundwater and/or surface water) on adjoining wetlands and other terrestrial habitats?

Climate	Water Resources	Energy Supply and Use	Transportation	Agriculture	Forests	Ecosystems, Biodiversity, and Ecosystem Services	Human Health
0	0	0	0	0	0	0	0
0	0	0	0	1	2	1	1
0	0	0	0	0	0	0	0
0	5	0	0	0	0	0	0
0	1	0	0	0	0	0	0
0	3	0	0	0	0	0	0
0	0	0	0	0	0	0	0
2	0	0	0	0	0	4	0
0	0	0	0	0	1	1	0
2	2	0	0	0	0	0	0

Energy, Water & Land Use	Urban Systems, Infrastructure, and Vulnerability	Indigenous Peoples, Land, and Resources	Land Use and Land Cover Change	Rural Communities	Biogeochemical Cycles
0	0	0	0	0	0
1	1	0	2	1	0
0	0	0	0	0	0
0	0	0	0	0	0
0	0	0	0	0	0
0	0	0	0	0	0
0	0	0	0	0	0
0	0	0	0	0	0
0	0	0	0	0	0
0	0	0	0	0	0

CATEGORY	RESOURCE AREA & LINKED QUESTION NUMBER	QUESTION
TERRESTRIAL ECOLOGY & WETLANDS	TW-4	Will expected climatological changes affect the impact of the plant and transmission lines on birds, bats, and other wildlife due to collisions, electrocution, or electromagnetic radiation effects?
TERRESTRIAL ECOLOGY & WETLANDS	TW-5	Will expected climatological changes affect coordination with other agencies regarding potential impacts to terrestrial biota?
TERRESTRIAL ECOLOGY & WETLANDS	TW-6	Will expected climatological changes affect the overall impact of the plant on regional standing stocks of important terrestrial species, including plant impacts on species' susceptibility to tolerate environmental changes and natural survival rates?
TERRESTRIAL ECOLOGY & WETLANDS	TW-7	Will expected climatological changes influence the impacts of the plant relative to leading to the presence of disease-causing vectors or nuisance, invasive, or introduced plant or animal species in the vicinity of the facility?
TERRESTRIAL ECOLOGY & WETLANDS	Overall Influence of Climate Change on Terrestrial and Wetland Ecology Impacts	Will expected climatological changes affect the terrestrial and wetlands ecology building or operational impact levels assigned in Chapters 3 and 4? Potential changes to the building impact level could occur if there are long-term, persistent impacts from building activities. Considering responses to previous questions, justify your answer in 4 sentences or less.
AQUATIC ECOLOGY	AQ-1	Will expected climatological changes affect the impact of the plant on aquatic biota and habitats? Consider in your answer overall impacts related to plant consumptive water use, entrainment, entrapment, impingement, stresses related to the cooling system, fish return systems, thermal backwashing and scouring, heated effluent plume, transmission and pipeline corridor maintenance.
AQUATIC ECOLOGY	AQ-2	Will expected climatological changes affect the overall impact of the plant on regional standing stocks of important aquatic species, including plant impacts on species' susceptibility to tolerate environmental changes and natural survival rates?
AQUATIC ECOLOGY	AQ-3	Will expected climatological changes influence the impacts of the plant relative to leading to the presence of disease-causing vectors or nuisance, invasive, or introduced aquatic species in the vicinity of the plant?
AQUATIC ECOLOGY	AQ-4	Will expected climatological changes affect the impact of the plant on altering the chemical and/or physical characteristics of the receiving water body, and any subsequent biological effects to important aquatic species?
AQUATIC ECOLOGY	AQ-5	Will expected climatological changes affect coordination with other agencies regarding potential impacts to aquatic biota?

Climate	Water Resources	Energy Supply and Use	Transportation	Agriculture	Forests	Ecosystems, Biodiversity, and Ecosystem Services	Human Health
0	0	0	0	0	0	4	0
0	0	0	0	0	0	1	0
0	1	0	0	0	1	1	0
0	0	0	0	0	1	2	0
0	1	0	0	0	0	4	0
0	3	0	0	0	0	9	0
0	1	0	0	0	0	2	0
0	1	0	0	0	0	2	0
0	0	0	0	0	0	1	0

Energy, Water & Land Use	Urban Systems, Infrastructure, and Vulnerability	Indigenous Peoples, Land, and Resources	Land Use and Land Cover Change	Rural Communities	Biogeochemical Cycles
0	0	0	0	0	0
0	0	0	0	0	0
0	0	0	0	0	1
0	0	0	0	0	0
0	0	0	0	0	1
0	0	0	0	0	1
0	0	0	0	0	0
0	0	0	0	0	0
0	0	0	0	0	0

CATEGORY	RESOURCE AREA & LINKED QUESTION NUMBER	QUESTION
AQUATIC ECOLOGY	Overall Influence of Climate Change on Aquatic Ecology Impacts	Will expected climatological changes affect the aquatic ecology building or operational impact levels assigned in Chapters 3 and 4? Potential changes to the building impact level could occur if there are long-term, persistent impacts from building activities. Considering responses to previous questions, justify your answer in 4 sentences or less.
SOCIOECONOMIC	S-1	Are expected climatological changes likely to alter the impacts of plant activities on local facilities and residency patterns, including housing, public schools, recreational resources, and first-responder agencies?
SOCIOECONOMIC	S-2	Considering traffic related to the operational workforce, deliveries, and similar activities, are expected climatological changes likely to alter the impacts of plant activities on local transportation infrastructure?
SOCIOECONOMIC	S-3	Are expected climatological changes likely to alter the impacts of plant activities on visual resources?
SOCIOECONOMIC	S-4	Are expected climatological changes likely to influence any anticipated mitigation actions?
SOCIOECONOMIC	S-5	Are expected climatological changes likely to alter the impacts of plant activities on employment, income, output, and tax revenues?
SOCIOECONOMIC	Overall Influence of Climate Change on Socioeconomic Impacts	Will expected climatological changes affect the socioeconomic building or operational impact levels assigned in Chapters 3 and 4? Potential changes to the building impact level could occur if there are long-term, persistent impacts from building activities. Considering responses to previous questions, justify your answer in 4 sentences or less.
ENV JUSTICE	EJ-1	Will expected climatological changes affect whether or not communities exist that are exceptionally dependent on subsistence resources in the region of interest?
ENV JUSTICE	EJ-2	Will expected climatological changes affect any identified human health impacts of the plant to EJ populations of interest?
ENV JUSTICE	EJ-3	Will expected climatological changes influence any effect of plant activities on established resource dependencies, cultural practices, or subsistence behaviors?

Climate	Water Resources	Energy Supply and Use	Transportation	Agriculture	Forests	Ecosystems, Biodiversity, and Ecosystem Services	Human Health
0	4	2	0	0	0	0	1
0	0	0	4	0	0	0	0
0	0	0	0	0	0	0	0
0	3	0	1	0	0	0	0
0	0	4	0	0	0	0	0
0	0	0	0	1	1	0	0
0	0	0	0	0	0	0	1
0	3	0	1	1	1	0	0

Energy, Water & Land Use	Urban Systems, Infrastructure, and Vulnerability	Indigenous Peoples, Land, and Resources	Land Use and Land Cover Change	Rural Communities	Biogeochemical Cycles
0	1	0	1	5	0
0	0	0	0	2	0
0	0	0	0	0	0
1	2	0	2	3	0
0	0	0	0	2	0
0	0	1	0	0	0
0	0	0	0	0	0
0	3	1	1	1	0

CATEGORY	RESOURCE AREA & LINKED QUESTION NUMBER	QUESTION
ENV JUSTICE	Overall Influence of Climate Change on Environmental Justice Impacts	Will expected climatological changes affect the environmental justice building or operational impact levels assigned in Chapters 3 or 4? Potential changes to the building impact level could occur if there are long-term, persistent impacts from building activities. Considering responses to previous questions, justify your answer in 4 sentences or less.
HISTORIC & CULTURAL	HCR-1	Will expected climatological changes affect the impact of operations and maintenance activities on identified onsite and offsite historic properties and/or cultural resources?
HISTORIC & CULTURAL	Overall Influence of Climate Change on Historic and Cultural Resource Impacts	Will expected climatological changes affect the historic and cultural resource operational impact level assigned in Chapters 3 or 4? Considering responses to previous question, justify your answer in 4 sentences or less:
METEOROLOGY	M-1	Will expected climatological changes affect cooling system impacts from the operating plant on local weather, including plume lengths, additional hours of fogging and icing, and salt deposition?
METEOROLOGY	Overall Influence of Climate Change on Meteorology Resource Impacts	Will expected climatological changes affect the meteorology resource operational impact level assigned in Chapters 3 or 4? Considering responses to previous question, justify your answer in 4 sentences or less:
AIR QUALITY	AirQ-1	Will expected climatological changes affect the sources, types, and estimates of annual air emissions from the operating plant and transmission lines?
AIR QUALITY	Overall Influence of Climate Change on Air Quality Resource Impacts	Will expected climatological changes affect the air quality resource operational impact level assigned in Chapters 3 or 4? Considering responses to previous question, justify your answer in 4 sentences or less:

Climate	Water Resources	Energy Supply and Use	Transportation	Agriculture	Forests	Ecosystems, Biodiversity, and Ecosystem Services	Human Health
2	4	0	0	0	0	0	0
4	1	0	0	0	0	0	0
2	2	2	2	0	0	0	0

Energy, Water & Land Use	Urban Systems, Infrastructure, and Vulnerability	Indigenous Peoples, Land, and Resources	Land Use and Land Cover Change	Rural Communities	Biogeochemical Cycles
0	0	4	0	0	0
0	0	0	0	0	0
0	0	0	0	0	0

CATEGORY	RESOURCE AREA & LINKED QUESTION NUMBER	QUESTION
NON-RAD HEALTH	NRH-1	Will expected climatological changes affect any health impacts from the presence of etiological agents?
NON-RAD HEALTH	NRH-2	Will expected climatological changes affect any health impacts from noise associated with plant operations?
NON-RAD HEALTH	NRH-3	Will expected climatological changes affect any health impacts from electromagnetic fields associated with plant operations?
NON-RAD HEALTH	NRH-4	Will expected climatological changes affect any occupational health risks associated with plant operations?
NON-RAD HEALTH	NRH-5	Will expected climatological changes affect potential health impacts related to nonradiological traffic-related accidents for operations and outage workers?
NON-RAD HEALTH	Overall Influence of Climate Change on Nonradiological Health Resource Impacts	Will expected climatological changes affect the nonradiological health resource operational impact level assigned in Chapters 3 or 4? Considering responses to previous questions, justify your answer in 4 sentences or less:
RADIOLOGICAL IMPACTS	R-1	Will expected climatological changes affect the possibility of exposure of humans to radiation from the operating facility?
RADIOLOGICAL IMPACTS	R-2	Will expected climatological changes affect the possibility of exposure of non-human biota to radiation from the operating facility?
RADIOLOGICAL IMPACTS	R-3	Will expected climatological changes affect estimated radiation doses to humans, including plant workers, in the area of interest during the operation of the facility?
RADIOLOGICAL IMPACTS	R-4	Will expected climatological changes affect estimated radiation doses to non-human biota in the area of interest during the operation of the facility?
RADIOLOGICAL IMPACTS	R-5	Will expected climatological changes affect the level of radiological environmental monitoring for the site?

Climate	Water Resources	Energy Supply and Use	Transportation	Agriculture	Forests	Ecosystems, Biodiversity, and Ecosystem Services	Human Health
0	0	0	0	0	0	0	3
0	0	0	0	0	0	0	0
0	0	1	0	0	0	0	0
0	1	0	0	0	0	0	3
0	0	0	3	0	0	0	0
0	0	0	0	0	0	0	0
0	3	0	0	0	0	0	0
0	0	0	0	0	0	0	0
0	3	0	0	0	0	0	0
0	3	0	0	0	0	1	0

Energy, Water & Land Use	Urban Systems, Infrastructure, and Vulnerability	Indigenous Peoples, Land, and Resources	Land Use and Land Cover Change	Rural Communities	Biogeochemical Cycles
0	0	1	0	0	1
0	0	0	1	0	0
0	0	0	0	0	0
0	0	0	0	0	0
0	0	0	0	0	0
0	0	1	0	0	0
0	0	0	0	0	0
0	0	2	0	0	0
0	0	1	0	0	0
0	0	1	2	0	0

CATEGORY	RESOURCE AREA & LINKED QUESTION NUMBER	QUESTION
RADIOLOGICAL IMPACTS	Overall Influence of Climate Change on Radiological Impacts	Will expected climatological changes affect the radiological operational impact level assigned in Chapters 3 or 4? Considering responses to previous questions, justify your answer in 4 sentences or less:
NON-RAD WASTE	NRW-1	Will expected climatological changes affect environmental impacts resulting from the generation and disposal of nonradioactive and mixed wastes from the operating facility?
NON-RAD WASTE	Overall Influence of Climate Change on Nonradioactive Waste Impacts	Will expected climatological changes affect the nonradiological health resource operational impact level assigned in Chapters 3 or 4? Considering responses to previous questions, justify your answer in 4 sentences or less:
ACCIDENTS	ACC-1	Will expected climatological changes affect the site-specific, 50^{th} percentile atmospheric dilution factor (i.e., χ/Q) used to evaluate dose consequences from postulated design basis accidents (DBAs)?
ACCIDENTS	ACC-2	Will expected climatological changes affect average environmental risks of severe accidents due to either changes in severe accident probabilities or associated consequences?
ACCIDENTS	ACC-3	Will expected climatological changes affect the severe accident mitigation alternative (SAMA) cost-benefit of the proposed facility?
ACCIDENTS	Overall Influence of Climate Change on Accident Impacts	Will expected climatological changes affect the accident impact level assigned in Chapters 3 or 4? Considering responses to previous questions, justify your answer in 4 sentences or less:
TRANSPORTATION OF RAD MATERIALS	T-1	Will expected climatological changes affect the radiological dose to the population in the region of interest due to transportation of radioactive materials?

Climate	Water Resources	Energy Supply and Use	Transportation	Agriculture	Forests	Ecosystems, Biodiversity, and Ecosystem Services	Human Health
0	0	0	0	0	0	0	0
4	1	0	0	0	0	0	0
4	4	0	1	2	0		0
4	4	0	1	2	0	1	0
0	0	0	1	0	0	0	0

Energy, Water & Land Use	Urban Systems, Infrastructure, and Vulnerability	Indigenous Peoples, Land, and Resources	Land Use and Land Cover Change	Rural Communities	Biogeochemical Cycles
0	0	0	1	0	0
0	0	0	0	0	0
0	0	0	1	0	0
0	0	0	1	0	0
0	0	0	0	0	0

CATEGORY	RESOURCE AREA & LINKED QUESTION NUMBER	QUESTION
TRANSPORTATION OF RAD MATERIALS	Overall Influence of Climate Change on the Transportation of Radioactive Materials	Will expected climatological changes affect the impact level assigned to the transportation of radioactive materials in Chapters 3 or 4? Considering responses to previous questions, justify your answer in 4 sentences or less:

Climate	Water Resources	Energy Supply and Use	Transportation	Agriculture	Forests	Ecosystems, Biodiversity, and Ecosystem Services	Human Health

Energy, Water & Land Use	Urban Systems, Infrastructure, and Vulnerability	Indigenous Peoples, Land, and Resources	Land Use and Land Cover Change	Rural Communities	Biogeochemical Cycles

	Land Use					
		Choose One Per Question				
	Question	Likely Increase	Likely Decrease	Stay the Same	Don't Know	Comment
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
	Agriculture					
FALSE	FALSE					
L-2	Are expected climatological changes likely to influence, or lead to, any plant impacts on local/regional land use classifications or economic development plans?			X		
FALSE	FALSE					
	Forests					
FALSE	FALSE					
L-2	Are expected climatological changes likely to influence, or lead to, any plant impacts on local/regional land use classifications or economic development plans?			X		
FALSE	FALSE					
	Ecosystems, Biodiversity, and Ecosystem Services					

	Question	Likely Increase	Likely Decrease	Stay the Same	Don't Know	Comment
FALSE	FALSE					
L-2	Are expected climatological changes likely to influence, or lead to, any plant impacts on local/regional land use classifications or economic development plans?			X		
FALSE	FALSE					
	Human Health					
FALSE	FALSE					
L-2	Are expected climatological changes likely to influence, or lead to, any plant impacts on local/regional land use classifications or economic development plans?			X		
FALSE	FALSE					
	Energy, Water & Land Use					
FALSE	FALSE					
L-2	Are expected climatological changes likely to influence, or lead to, any plant impacts on local/regional land use classifications or economic development plans?			X		
FALSE	FALSE					
	Urban Systems, Infrastructure, and Vulnerability					
FALSE	FALSE					
L-2	Are expected climatological changes likely to influence, or lead to, any plant impacts on local/regional land use classifications or economic development plans?			X		
FALSE	FALSE					
	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
	Land Use and Land Cover Change					
FALSE	FALSE					

	Question	Likely Increase	Likely Decrease	Stay the Same	Don't Know	Comment
L-2	Are expected climatological changes likely to influence, or lead to, any plant impacts on local/regional land use classifications or economic development plans?			X		
FALSE	FALSE					
	Rural Communities					
FALSE	FALSE					
L-2	Are expected climatological changes likely to influence, or lead to, any plant impacts on local/regional land use classifications or economic development plans?			X		
FALSE	FALSE					
	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
	Land Use Summary					**Summary Text**
FALSE	**Overall – Are expected climatological changes likely to affect impacts related to on-site, off-site, and/or transmission line corridor land disturbance activities? Justify your answer in 4 sentences or less.**			X		Expected climatological changes will not impact land use and visual resources for transmission line corridor land disturbance activities. Climatological changes may required updates or modifications to transmission lines, but are not expected to create such significant changes that they would impact overall land use or visual resources at Palisades.

	Question	Likely Increase	Likely Decrease	Stay the Same	Don't Know	Comment
L-2	**Overall – Are expected climatological changes likely to influence, or lead to, any plant impacts on local/regional land use classifications or economic development plans? Justify your answer in 4 sentences or less.**			X		Expected climatological changes will not impact land use and visual resources for land use classifications or economic development plans. Palisades is zoned as industrial use, and climatological changes would not necessitate any changes to that zoned use. Regional ecological development plans may change and adapt with future climatological change, but they would not fundamentally impact the land use or visual resources at Palisades specifically.

	Question	Likely Increase	Likely Decrease	Stay the Same	Don't Know	Comment
FALSE	**Overall – Are expected climatological changes likely to influence, or lead to, any plant impacts found to disrupt access to land or water resources or to affect existing land uses or private land access? Justify your answer in 4 sentences or less.**			X		Expected climatological changes will not impact land use and visual resources for access to land or water resources or to affect existing land uses or private land access. Even with potential Lake Michigan water level changes with future climatological change, Palisades land use, zoning, and access restrictions would remaing the same. Therefore, while slightly more land may require access restrictions (e.g., is Lake Michigan water level decreases), overall land use at Palisades would not change.
Conclusion	**Overall – Will expected climatological changes affect the land use building or operational impact levels assigned in Chapters 3 and 4? Potential changes to the building impact level could occur if there are long-term, persistent impacts from building activities. Considering responses to previous questions, justify your answer in 4 sentences or less.**			X		Exepected climatological changes at Palisades would not fundamentally affect the land use or visual resources at the site. No anticipated climatological changes would necessitate major construction activities at Palisades that would alter the land use or visual resources present, especially since the site is zoned for industrial use.

	Meteorology					
		Choose One Per Question				
	Question	**Likely Increase**	**Likely Decrease**	**Stay the Same**	**Don't Know**	**Comment**
	Climate					
M-1	Will expected climatological changes affect cooling system impacts from the operating plant on local weather, including plume lengths, additional hours of fogging and icing, and salt deposition?	X				
	Water Resources					
M-1	Will expected climatological changes affect cooling system impacts from the operating plant on local weather, including plume lengths, additional hours of fogging and icing, and salt deposition?	X				
FALSE	**FALSE**					
FALSE	FALSE					
FALSE	**FALSE**					
FALSE	FALSE					
FALSE	**FALSE**					
FALSE	FALSE					
FALSE	**FALSE**					
FALSE	FALSE					
FALSE	**FALSE**					
FALSE	FALSE					
FALSE	**FALSE**					
FALSE	FALSE					
FALSE	**FALSE**					
FALSE	FALSE					
FALSE	**FALSE**					
FALSE	FALSE					
FALSE	**FALSE**					
FALSE	FALSE					
FALSE	**FALSE**					
FALSE	FALSE					

	Question	Likely Increase	Likely Decrease	Stay the Same	Don't Know	Comment
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
	Meteorology					**Summary Text**
M-1	**Overall – Will expected climatological changes affect cooling system impacts from the operating plant on local weather, including plume lengths, additional hours of fogging and icing, and salt deposition? Justify your answer in 4 sentences or less.**	X				The increase in temperature, humidity and lake surface water temperature might have a small effect on the plume from the cooling system. Higher temperature can increase the rate of evaporation from the cooling tower, and higher humidity can create more supersaturation conditions increasing the formation of visible droplets within the plume. This effect is likely to be small compared to baseline conditions.
Conclusion	**Overall – Will expected climatological changes affect the meteorology resource operational impact level assigned in Chapters 3 or 4? Considering responses to previous question, justify your answer in 4 sentences or less:**	X				Atmopsheric dispersion can increase due to increased temperature and vertical mixing and thus may decrease X/Qs, however number of temperature inversions and stagnation events can also increase the X/Qs. Overall the impact should be small on the impact of power plant operations.

	Air Quality					
		Choose One Per Question				
	Question	Likely Increase	Likely Decrease	Stay the Same	Don't Know	Comment
	Climate					
AirQ-1	Will expected climatological changes affect the sources, types, and estimates of annual air emissions from the operating plant and transmission lines?	X				
	Water Resources					
AirQ-1	Will expected climatological changes affect the sources, types, and estimates of annual air emissions from the operating plant and transmission lines?	X				
	Energy Supply and Use					
AirQ-1	Will expected climatological changes affect the sources, types, and estimates of annual air emissions from the operating plant and transmission lines?	X				
	Transportation					
AirQ-1	Will expected climatological changes affect the sources, types, and estimates of annual air emissions from the operating plant and transmission lines?	X				
FALSE	**FALSE**					
FALSE	FALSE					
FALSE	**FALSE**					
FALSE	FALSE					
FALSE	**FALSE**					
FALSE	FALSE					
FALSE	**FALSE**					
FALSE	FALSE					
FALSE	**FALSE**					

	Question	Likely Increase	Likely Decrease	Stay the Same	Don't Know	Comment
FALSE	FALSE					
FALSE	**FALSE**					
FALSE	FALSE					
FALSE	**FALSE**					
FALSE	FALSE					
FALSE	**FALSE**					
FALSE	FALSE					
FALSE	**FALSE**					
FALSE	FALSE					
FALSE	**FALSE**					
FALSE	FALSE					
	Air Quality					**Summary Text**
AQ-1	**Overall – Will expected climatological changes affect the sources, types, and estimates of annual air emissions from the operating plant and transmission lines? Justify your answer in 4 sentences or less.**	X				Increasing electricity demand may increase frequency of backup diesel power and emergency generators and thus sligtly increase emisisons, but still much below regulated thresholds.
Conclusion	**Overall – Will expected climatological changes affect the air quality resource operational impact level assigned in Chapters 3 or 4? Considering responses to previous question, justify your answer in 4 sentences or less:**	X				Nominal increase in ozone formation from NOx emissions is aniticipated due to temperature increase. Overall, the emissions and impact on air quality should be very small due to climate change.

	Hydrology					
		Choose One Per Question				
	Question	Likely Increase	Likely Decrease	Stay the Same	Don't Know	Comment
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
	Water Resources					
H-1	Will expected climatological changes affect the anticipated hydrologic alterations resulting from station building or operation?			X		
H-2	Will expected climatological changes influence, or lead to, plant effluent discharges impacting the water quality of receiving water bodies?			X		
H-3	Will expected climatological changes influence, or lead to, plant impacts to other water uses and other water users?			X		
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					

	Question	Likely Increase	Likely Decrease	Stay the Same	Don't Know	Comment
FALSE	FALSE					
FALSE	**FALSE**					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	**FALSE**					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	**FALSE**					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	**FALSE**					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	**FALSE**					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	**FALSE**					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	**FALSE**					

	Question	Likely Increase	Likely Decrease	Stay the Same	Don't Know	Comment
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	**FALSE**					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	**FALSE**					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
	Hydrology Summary					**Summary Text**
H-1	**Overall – Will expected climatological changes affect the anticipated hydrologic alterations resulting from station building or operation? Justify your answer in 4 sentences or less.**			X		Projected precipitation patterns by midcentury indicate that winter and spring runoff in southwest Michigan may increase while summer runoff may slightly decrease. The projected changes in future runoff may result in noticeable changes to downstream water quality from plant building and operation-related activities that affect surface runoff and infiltration patterns. The impacts of these alterations are expected to be controlled and monitored under applicable regulations and following best management practices that assure adherence to State water quality standards.

	Question	Likely Increase	Likely Decrease	Stay the Same	Don't Know	Comment
H-2	**Overall – Will expected climatological changes influence, or lead to, plant effluent discharges impacting the water quality of receiving water bodies? Justify your answer in 4 sentences or less.**			X		Midcentury projections indicate surface temperatures in Lake Michigan are expected to increase, lake water levels would continue to show variability, and snow and ice cover may decline. Continued plant effluent discharges to Lake Michigan are not expected to result in noticeable impacts to water quality because of the large volume of the Lake compared to the volume of plant effluent discharges. The plant is expected to continue following all conditions in its current and future renewed NPDES permits that assure adherence to State and Federal water quality standards.
H-3	**Overall – Will expected climatological changes influence, or lead to, plant impacts to other water uses and other water users? Justify your answer in 4 sentences or less.**			X		In Palisades' vicinity, water usage is currently permitted and managed under appropriate and applicable regulations. This usage and any foreseeable future usage is also expected to be managed under applicable regulation that are protective of water resources and water users. Because Palisades' continued water use, accounting for midcentury projections, is expected to remain minor compared to water availability in Lake Michigan, the plant's impacts to other water uses and water users are expected to remain similar.
FALSE	**Overall – As climate changes, will plant hydrological impacts affect the ability of the region to meet applicable water quality and water use standards and regulations? Justify your answer in 4 sentences or less.**					

	Question	Likely Increase	Likely Decrease	Stay the Same	Don't Know	Comment
Conclusion	**Overall – Will expected climatological changes affect the hydrology building or operational impact levels assigned in Chapters 3 and 4? Potential changes to the building impact level could occur if there are long-term, persistent impacts from building activities. Considering responses to previous questions, justify your answer in 4 sentences or less.**			X		Accounting for midcentury projections, climatological changes would not result in significant impacts from building activities and continued operations of Palisades. Midcentury projections may result in noticeable changes in runoff patterns but the impacts from plant activities would continue to be permitted, managed, and monitored under applicable regulations that are protective of the State's water quality standards. Impacts of plant effluent discharges, accounting for midcentury projections, are expected to remain similar to prior plant operations and would be managed under current and future renewed NPDES permits. Impacts of Palisades' water use, accounting for midcentury projections, are not expected to significantly impact current and forseeable water usage and water users in the vicinity.

	Terrestrial Ecology					
	Question	Choose One Per Question				
	Question	**Likely Increase**	**Likely Decrease**	**Stay the Same**	**Don't Know**	**Comment**
TW-1	Will expected climatological changes affect plant impacts from facility and landscape maintenance, noise, and traffic on terrestrial habitats and wildlife?			x		
FALSE	FALSE					
TW-3	Will expected climatological changes affect the impact of the plant (including the operation of cooling and evaporation ponds, and the use of groundwater and/or surface water) on adjoining wetlands and other terrestrial habitats?			x		
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
	Water Resources					
FALSE	FALSE					
FALSE	FALSE					
TW-3	Will expected climatological changes affect the impact of the plant (including the operation of cooling and evaporation ponds, and the use of groundwater and/or surface water) on adjoining wetlands and other terrestrial habitats?			x		
FALSE	FALSE					
FALSE	FALSE					
TW-6	Will expected climatological changes affect the overall impact of the plant on regional standing stocks of important terrestrial species, including plant impacts on species' susceptibility to tolerate environmental changes and natural survival rates?			x		
FALSE	FALSE					
FALSE	**FALSE**					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	**FALSE**					
FALSE	FALSE					

	Question	Likely Increase	Likely Decrease	Stay the Same	Don't Know	Comment
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
	Forests					
FALSE	FALSE					
TW-2	Will expected climatological changes affect the impact of drift from plant facilities on terrestrial habitats, wetlands, and species?	x				
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
TW-6	Will expected climatological changes affect the overall impact of the plant on regional standing stocks of important terrestrial species, including plant impacts on species' susceptibility to tolerate environmental changes and natural survival rates?			x		
TW-7	Will expected climatological changes influence the impacts of the plant relative to leading to the presence of disease-causing vectors or nuisance, invasive, or introduced plant or animal species in the vicinity of the facility?			x		
	Ecosystems, Biodiversity, and Ecosystem Services					
TW-1	Will expected climatological changes affect plant impacts from facility and landscape maintenance, noise, and traffic on terrestrial habitats and wildlife?			x		
TW-2	Will expected climatological changes affect the impact of drift from plant facilities on terrestrial habitats, wetlands, and species?	x				
FALSE	FALSE					

	Question	Likely Increase	Likely Decrease	Stay the Same	Don't Know	Comment
TW-4	Will expected climatological changes affect the impact of the plant and transmission lines on birds, bats, and other wildlife due to collisions, electrocution, or electromagnetic radiation effects?			x		
TW-5	Will expected climatological changes affect coordination with other agencies regarding potential impacts to terrestrial biota?	x				
TW-6	Will expected climatological changes affect the overall impact of the plant on regional standing stocks of important terrestrial species, including plant impacts on species' susceptibility to tolerate environmental changes and natural survival rates?			x		
TW-7	Will expected climatological changes influence the impacts of the plant relative to leading to the presence of disease-causing vectors or nuisance, invasive, or introduced plant or animal species in the vicinity of the facility?			x		

	Question	Likely Increase	Likely Decrease	Stay the Same	Don’t Know	Comment
FALSE	**FALSE**					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	**FALSE**					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
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FALSE	**FALSE**					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
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FALSE	FALSE					
FALSE	FALSE					
FALSE	**FALSE**					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	**FALSE**					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					

	Question	Likely Increase	Likely Decrease	Stay the Same	Don't Know	Comment
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
	Biogeochemical Cycles					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
TW-6	Will expected climatological changes affect the overall impact of the plant on regional standing stocks of important terrestrial species, including plant impacts on species' susceptibility to tolerate environmental changes and natural survival rates?					
FALSE	FALSE					
	Terrestrial Summary					**Summary Text**
TW-1	**Overall – Will expected climatological changes affect plant impacts from facility and landscape maintenance, noise, and traffic on terrestrial habitats and wildlife? Justify your answer in 4 sentences or less.**			x		Climatalogical changes unlikely to change current facility and landscape maintenance, noise, and traffic levels and patterns, so impacts to terrestrial resources should be similar to current operational levels.
TW-2	**Overall – Will expected climatological changes affect the impact of drift from plant facilities on terrestrial habitats, wetlands, and species? Justify your answer in 4 sentences or less.**	X				The increase in temperature, humidity and lake surface water temperature might have a small effect on the cooling system drift. Higher temperature can increase the rate of evaporation from cooling tower, and higher humidity can create more supersaturation conditions increasing the formation of visible droplets within the plume. Resulting drift not expected to differ in chemical composition, travel further, or change vegetatation depositional patterns.

	Question	Likely Increase	Likely Decrease	Stay the Same	Don't Know	Comment
TW-3	**Overall – Will expected climatological changes affect the impact of the plant (including the operation of cooling and evaporation ponds, and the use of groundwater and/or surface water) on adjoining wetlands and other terrestrial habitats? Justify your answer in 4 sentences or less.**			x		In Palisades' vicinity, water usage is currently permitted and managed under appropriate and applicable regulations. This usage and any foreseeable future usage is also expected to be managed under applicable regulation that are protective of water resources and water users. Because Palisades continued water use, accounting for midcentury projections, is expected to remain minor compared to water availability in Lake Michigan, the plant's impacts on terrestrial habitats and wetlands are expected to remain similar.
TW-4	**Overall – Will expected climatological changes affect the impact of the plant and transmission lines on birds, bats, and other wildlife due to collisions, electrocution, or electromagnetic radiation effects? Justify your answer in 4 sentences or less.**			x		Expected climatological changes not likely to change the overall impact of plant buildings, structures, and transmission lines on birds, bats, and other wildlife due to collisions, electrocution, or electromagnetic effects. As analyzed in the 2024 LR GEIS, the NRC determined that these impacts to terrestrial resources were SMALL. However, because changes in species composition are possible from climate change, the species affected by these hazards could change or remain the same.
TW-5	**Overall – Will expected climatological changes affect coordination with other agencies regarding potential impacts to terrestrial biota? Justify your answer in 4 sentences or less.**	x				Palisades staff regularly coordinate with EGLE and other agencies, because the entire site is protected under the CZMA and contains designated critical dune areas. Although regional and local changes in species composition may change as a result of expected climatological changes, coordination regarding potential impacts for current terrestrial species of concern is unlikely to increase. The NRC staff expect existing coordination networks to facilitate information sharing and resource planning regarding changes in species presence or abundance. However, increased coordination could be needed for new species to address concerns at broader scales.
TW-6	**Overall – Will expected climatological changes affect the overall impact of the plant on regional standing stocks of important terrestrial species, including plant impacts on species' susceptibility to tolerate environmental changes and natural survival rates? Justify your answer in 4 sentences or less.**			x		Climatalogical changes not expected to change the plant's impact on regional standing stocks of important terrestrial species, given the small area affected by plant operations.

	Question	Likely Increase	Likely Decrease	Stay the Same	Don't Know	Comment
TW-7	**Overall – Will expected climatological changes influence the impacts of the plant relative to leading to the presence of disease-causing vectors or nuisance, invasive, or introduced plant or animal species in the vicinity of the facility? Justify your answer in 4 sentences or less.**			x		Expected climatological changes have the potential to influence the distribution and abundance of undesirable organisms, including disease causing vectors, nuisance species, introduced species, and invasive species. However, given the small area of affected by plant operations, it is not expected that the project impacts would cause a change in the presence or abundance of these species.
Conclusion	**Overall – Will expected climatological changes affect the terrestrial and wetlands ecology building or operational impact levels assigned in Chapters 3 and 4? Potential changes to the building impact level could occur if there are long-term, persistent impacts from building activities. Considering responses to previous questions, justify your answer in 4 sentences or less.**	x				As described above and in hydrology, land use, air, and metereology, climatalogical changes may have a small effect on the plume from the cooling system but is likely to be small compared to baseline conditions. Expected climatalogical changes have the potential to influence the distribution and abundance of terrestrial organisms but effects from plant operations anticipated to be limited in scope. Increased coordination between agencies could be required to address concerns related to specific species of concern at landscape or regional scales.

	Aquatic Ecology					
		Choose One Per Question				
	Question	Likely Increase	Likely Decrease	Stay the Same	Don't Know	
FALSE	FALSE					Comment
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
	Water Resources					
AQ-1	Will expected climatological changes affect the impact of the plant on aquatic biota and habitats? Consider in your answer overall impacts related to plant consumptive water use, entrainment, entrapment, impingement, stresses related to the cooling system, fish return systems, thermal backwashing and scouring, heated effluent plume, transmission and pipeline corridor maintenance.			X		
AQ-2	Will expected climatological changes affect the overall impact of the plant on regional standing stocks of important aquatic species, including plant impacts on species' susceptibility to tolerate environmental changes and natural survival rates?			X		
AQ-3	Will expected climatological changes influence the impacts of the plant relative to leading to the presence of disease-causing vectors or nuisance, invasive, or introduced aquatic species in the vicinity of the plant?			X		
AQ-4	Will expected climatological changes affect the impact of the plant on altering the chemical and/or physical characteristics of the receiving water body, and any subsequent biological effects to important aquatic species?			x		
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					

	Question	Likely Increase	Likely Decrease	Stay the Same	Don't Know	
FALSE	FALSE					
FALSE	**FALSE**					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	**FALSE**					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
	Ecosystems, Biodiversity, and Ecosystem Services					
AQ-1	Will expected climatological changes affect the impact of the plant on aquatic biota and habitats? Consider in your answer overall impacts related to plant consumptive water use, entrainment, entrapment, impingement, stresses related to the cooling system, fish return systems, thermal backwashing and scouring, heated effluent plume, transmission and pipeline corridor maintenance.			x		
AQ-2	Will expected climatological changes affect the overall impact of the plant on regional standing stocks of important aquatic species, including plant impacts on species' susceptibility to tolerate environmental changes and natural survival rates?			x		
AQ-3	Will expected climatological changes influence the impacts of the plant relative to leading to the presence of disease-causing vectors or nuisance, invasive, or introduced aquatic species in the vicinity of the plant?			x		
AQ-4	Will expected climatological changes affect the impact of the plant on altering the chemical and/or physical characteristics of the receiving water body, and any subsequent biological effects to important aquatic species?			x		
AQ-5	Will expected climatological changes affect coordination with other agencies regarding potential impacts to aquatic biota?			x		
FALSE	**FALSE**					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					

	Question	Likely Increase	Likely Decrease	Stay the Same	Don’t Know	
FALSE	**FALSE**					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	**FALSE**					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	**FALSE**					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	**FALSE**					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	**FALSE**					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
	Biogeochemical Cycles					
AQ-1	Will expected climatological changes affect the impact of the plant on aquatic biota and habitats? Consider in your answer overall impacts related to plant consumptive water use, entrainment, entrapment, impingement, stresses related to the cooling system, fish return systems, thermal backwashing and scouring, heated effluent plume, transmission and pipeline corridor maintenance.			x		

	Question	Likely Increase	Likely Decrease	Stay the Same	Don't Know	
AQ-2	Will expected climatological changes affect the overall impact of the plant on regional standing stocks of important aquatic species, including plant impacts on species' susceptibility to tolerate environmental changes and natural survival rates?			x		
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
	Aquatic Summary					**Summary Text**
AQ-1	**Overall – Will expected climatological changes affect the impact of the plant on aquatic biota and habitats? Consider in your answer overall impacts related to plant consumptive water use, entrainment, entrapment, impingement, stresses related to the cooling system, fish return systems, thermal backwashing and scouring, heated effluent plume, transmission and pipeline corridor maintenance. Justify your answer in 4 sentences or less.**			x		Based on the latest USGCRP reports (NCA5), both precipitation and temperatures are expected to increase in the area where the plant is located over the next decade. Despite these increases, it is not expected to affect the plant's impact on water use, entrainment, entrapment, impingement, cooling system stresses, thermal backwashing and scouring, or transmission and pipeline corridor maintenance. This is due to the relatively small portion of Lake Michigan that is influenced by the plant (<0.0006%). Although extreme changes in lake water levels could potentially impact the heated effluent plume, past water level variability over the last 3 decades (low water levels from 1998-2013 and high water levels since 2015) has not yet had a significant impact.

	Question	Likely Increase	Likely Decrease	Stay the Same	Don't Know	
AQ-2	**Overall – Will expected climatological changes affect the overall impact of the plant on regional standing stocks of important aquatic species, including plant impacts on species' susceptibility to tolerate environmental changes and natural survival rates? Justify your answer in 4 sentences or less.**			x		A 0.1°F increase in Lake Michigan's temperature could cumulatively affect its aquatic ecosystem over the next decade, potentially causing shifts in biodiversity, altering food web dynamics, and increasing stress on more sensitive species. While plant discharges may also incrementally raise local water temperatures, these effects remain localized due to the relatively small amount of water used by the plant and the limited area impacted by its discharges. Consequently, climatological changes are not anticipated to affect the plant's impact on the lake-wide aquatic system.
AQ-3	**Overall – Will expected climatological changes influence the impacts of the plant relative to leading to the presence of disease-causing vectors or nuisance, invasive, or introduced aquatic species in the vicinity of the plant? Justify your answer in 4 sentences or less.**			x		Climatological changes, particularly rising surface water temperatures, are likely to influence aquatic resources by creating more favorable conditions for invasives that better tolerate warming temperatures. However, given the small area of Lake Michigan affected by the plant, it is not expected that the impacts of the plant will cause a change in the presence of disease-causing vectors or nuisance, invasive, or introduced aquatic species near the plant.
AQ-4	**Overall – Will expected climatological changes affect the impact of the plant on altering the chemical and/or physical characteristics of the receiving water body, and any subsequent biological effects to important aquatic species? Justify your answer in 4 sentences or less.**			x		Climatological changes will likely have some influence, however, given the small percentage of Lake Michigan waters impacted by the plant it is not anticipated that the impacts of the plant will alter the chemical and or physical characteristics of the recieving water body beyond the immediate area.
AQ-5	**Overall – Will expected climatological changes affect coordination with other agencies regarding potential impacts to aquatic biota? Justify your answer in 4 sentences or less.**			x		Climate change is not expected to noticeably affect the ability of agencies to coordinate on the protection of aquatic species; the importance of close coordination would, however, be greater.

	Question	Likely Increase	Likely Decrease	Stay the Same	Don't Know	
Conclusion	**Overall – Will expected climatological changes affect the aquatic ecology building or operational impact levels assigned in Chapters 3 and 4? Potential changes to the building impact level could occur if there are long-term, persistent impacts from building activities. Considering responses to previous questions, justify your answer in 4 sentences or less.**			x		While the baseline conditions of the affected environment will be shifted due to impacts from climate change (particularly increasing precipitation and temperature) given the relatively small volume of Lake Michigan affected by the plant impact levels on aquatic resources are not expected to change.

	Historic and Cultural Resouces					
		Choose One Per Question				
	Question	**Likely Increase**	**Likely Decrease**	**Stay the Same**	**Don't Know**	**Comment**
	Climate					
HCR-1	Will expected climatological changes affect the impact of operations and maintenance activities on identified onsite and offsite historic properties and/or cultural resources?			X		
	Water Resources					
HCR-1	Will expected climatological changes affect the impact of operations and maintenance activities on identified onsite and offsite historic properties and/or cultural resources?			X		
FALSE	**FALSE**					
FALSE	FALSE					
FALSE	**FALSE**					
FALSE	FALSE					
FALSE	**FALSE**					
FALSE	FALSE					
FALSE	**FALSE**					
FALSE	FALSE					
FALSE	**FALSE**					
FALSE	FALSE					
FALSE	**FALSE**					
FALSE	FALSE					
FALSE	**FALSE**					
FALSE	FALSE					
FALSE	**FALSE**					
FALSE	FALSE					
	Indigenous Peoples, Land, and Resources					

	Question	Likely Increase	Likely Decrease	Stay the Same	Don't Know	Comment
HCR-1	Will expected climatological changes affect the impact of operations and maintenance activities on identified onsite and offsite historic properties and/or cultural resources?			X		
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
	Historic and Cultural Resouces Summary					**Summary Text**
HCR-1	**Overall – Will expected climatological changes affect the impact of operations and maintenance activities on identified onsite and offsite historic properties and/or cultural resources? Justify your answer in 4 sentences or less.**			X		There are no eligible archaeological, shipwreck, or architectural resources identified within the direct and indirect area of potential effects. Therefore, there are no expected impacts on this eligible resource that might occur based on future climatological changes.
Conclusion	**Overall – Will expected climatological changes affect the historic and cultural resource operational impact level assigned in Chapters 3 or 4? Considering responses to previous question, justify your answer in 4 sentences or less:**			X		While expected climatological changes might increase erosion throughout Palisades, and this erosion may lead to the discovery of additional historic and cultural resources, based on the lack of identified historic properties at Palisades there are no expected impacts from future climatological changes.

	Socioeconomics					
		Choose One Per Question				
	Question	**Likely Increase**	**Likely Decrease**	**Stay the Same**	**Don't Know**	
FALSE	**FALSE**					**Comment**
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
	Water Resources					
S-1	Are expected climatological changes likely to alter the impacts of plant activities on local facilities and residency patterns, including housing, public schools, recreational resources, and first-responder agencies?			X		
FALSE	FALSE					
FALSE	FALSE					
S-4	Are expected climatological changes likely to influence any anticipated mitigation actions?			X		
FALSE	FALSE					
	Energy Supply and Use					
S-1	Are expected climatological changes likely to alter the impacts of plant activities on local facilities and residency patterns, including housing, public schools, recreational resources, and first-responder agencies?			X		
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
S-5	Are expected climatological changes likely to alter the impacts of plant activities on employment, income, output, and tax revenues?			X		
	Transportation					
FALSE	FALSE					
S-2	Considering traffic related to the operational workforce, deliveries, and similar activities, are expected climatological changes likely to alter the impacts of plant activities on local transportation infrastructure?			x		

	Question	Likely Increase	Likely Decrease	Stay the Same	Don't Know	
FALSE	FALSE					
S-4	Are expected climatological changes likely to influence any anticipated mitigation actions?			x		
FALSE	FALSE					
FALSE	**FALSE**					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	**FALSE**					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	**FALSE**					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					

	Question	Likely Increase	Likely Decrease	Stay the Same	Don't Know	
	Human Health					
S-1	Are expected climatological changes likely to alter the impacts of plant activities on local facilities and residency patterns, including housing, public schools, recreational resources, and first-responder agencies?			X		
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
	Energy, Water & Land Use					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
S-4	Are expected climatological changes likely to influence any anticipated mitigation actions?			X		
FALSE	FALSE					
	Urban Systems, Infrastructure, and Vulnerability					
S-1	Are expected climatological changes likely to alter the impacts of plant activities on local facilities and residency patterns, including housing, public schools, recreational resources, and first-responder agencies?			X		
FALSE	FALSE					
FALSE	FALSE					
S-4	Are expected climatological changes likely to influence any anticipated mitigation actions?			X		
FALSE	FALSE					
FALSE	**FALSE**					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
	Land Use and Land Cover Change					

	Question	Likely Increase	Likely Decrease	Stay the Same	Don't Know	
S-1	Are expected climatological changes likely to alter the impacts of plant activities on local facilities and residency patterns, including housing, public schools, recreational resources, and first-responder agencies?			X		
FALSE	FALSE					
FALSE	FALSE					
S-4	Are expected climatological changes likely to influence any anticipated mitigation actions?			X		
FALSE	FALSE					
	Rural Communities					
S-1	Are expected climatological changes likely to alter the impacts of plant activities on local facilities and residency patterns, including housing, public schools, recreational resources, and first-responder agencies?			X		
S-2	Considering traffic related to the operational workforce, deliveries, and similar activities, are expected climatological changes likely to alter the impacts of plant activities on local transportation infrastructure?			X		
FALSE	FALSE					
S-4	Are expected climatological changes likely to influence any anticipated mitigation actions?			X		
S-5	Are expected climatological changes likely to alter the impacts of plant activities on employment, income, output, and tax revenues?			X		
FALSE	**FALSE**					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
	Socioeconomics Summary					**Summary Text**

	Question	Likely Increase	Likely Decrease	Stay the Same	Don't Know	
S-1	**Overall – Are expected climatological changes likely to alter the impacts of plant activities on local facilities and residency patterns, including housing, public schools, recreational resources, and first-responder agencies? Justify your answer in 4 sentences or less.**			X		Resumption of Palisades does not have significant impacts on the local facilities and residency patterns, including housing, public schools, recreational resources, and first-responder agencies. Expected climatological changes are not likely to alter these impacts. The socioeconomic impacts will most likely stay the same.
S-2	**Overall – Considering traffic related to the operational workforce, deliveries, and similar activities, are expected climatological changes likely to alter the impacts of plant activities on local transportation infrastructure? Justify your answer in 4 sentences or less.**			X		By the middle of the next century, southwestern Michigan is expected to face increased rainfall and flood risks, which may place pressure on regional transportation infrastructure. Transportation systems will need to enhance their resilience. However, resumption of Palisades does not have significant impacts on local transportation infrastructure. These impacts are not likely to be altered by the climatological changes.
FALSE	**Overall – Are expected climatological changes likely to alter the impacts of plant activities on visual resources? Justify your answer in 4 sentences or less.**					
S-4	**Overall – Are expected climatological changes likely to influence any anticipated mitigation actions? Justify your answer in 4 sentences or less.**			X		The proposed plant activities have no significant impacts on scioeconomics. No climate change mitigation actions are anticipated.
S-5	**Overall – Are expected climatological changes likely to alter the impacts of plant activities on employment, income, output, and tax revenues? Justify your answer in 4 sentences or less.**			X		Resumption of Palisades does not have significant impacts on employment, income, output and tax revenues. Expected climatological changes are not likely to alter these impacts. The socioeconomic impacts will most likely stay the same.

	Question	Likely Increase	Likely Decrease	Stay the Same	Don't Know	
Conclusion	**Overall – Will expected climatological changes affect the socioeconomic building or operational impact levels assigned in Chapters 3 and 4? Potential changes to the building impact level could occur if there are long-term, persistent impacts from building activities. Considering responses to previous questions, justify your answer in 4 sentences or less.**			X		Overall, expected climatological changes are not likely to affect the socioeconomic impacts assigned.

	Environmental Justice					
		Choose One Per Question				
	Question	Likely Increase	Likely Decrease	Stay the Same	Don't Know	Comment
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
	Water Resources					
FALSE	FALSE					
FALSE	FALSE					
EJ-3	Will expected climatological changes influence any effect of plant activities on established resource dependencies, cultural practices, or subsistence behaviors?			X		
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
	Transportation					
FALSE	FALSE					
FALSE	FALSE					
EJ-3	Will expected climatological changes influence any effect of plant activities on established resource dependencies, cultural practices, or subsistence behaviors?	X				
	Agriculture					
EJ-1	Will expected climatological changes affect whether or not communities exist that are exceptionally dependent on subsistence resources in the region of interest?			X		
FALSE	FALSE					

	Question	Likely Increase	Likely Decrease	Stay the Same	Don't Know	Comment
EJ-3	Will expected climatological changes influence any effect of plant activities on established resource dependencies, cultural practices, or subsistence behaviors?			X		
	Forests					
EJ-1	Will expected climatological changes affect whether or not communities exist that are exceptionally dependent on subsistence resources in the region of interest?			X		
FALSE	FALSE					
EJ-3	Will expected climatological changes influence any effect of plant activities on established resource dependencies, cultural practices, or subsistence behaviors?			X		
FALSE	**FALSE**					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
	Human Health					
FALSE	FALSE					
EJ-2	Will expected climatological changes affect any identified human health impacts of the plant to EJ populations of interest?			X		
FALSE	FALSE					
FALSE	**FALSE**					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
	Urban Systems, Infrastructure, and Vulnerability					
FALSE	FALSE					
FALSE	FALSE					

	Question	Likely Increase	Likely Decrease	Stay the Same	Don't Know	Comment
EJ-3	Will expected climatological changes influence any effect of plant activities on established resource dependencies, cultural practices, or subsistence behaviors?			X		
	Indigenous Peoples, Land, and Resources					
EJ-1	Will expected climatological changes affect whether or not communities exist that are exceptionally dependent on subsistence resources in the region of interest?					
FALSE	FALSE					
EJ-3	Will expected climatological changes influence any effect of plant activities on established resource dependencies, cultural practices, or subsistence behaviors?					
	Land Use and Land Cover Change					
FALSE	FALSE					
FALSE	FALSE					
EJ-3	Will expected climatological changes influence any effect of plant activities on established resource dependencies, cultural practices, or subsistence behaviors?			X		
	Rural Communities					
FALSE	FALSE					
FALSE	FALSE					
EJ-3	Will expected climatological changes influence any effect of plant activities on established resource dependencies, cultural practices, or subsistence behaviors?	X				
FALSE	**FALSE**					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					

	Question	Likely Increase	Likely Decrease	Stay the Same	Don't Know	Comment
	Environmental Justice Summary					**Summary Text**
EJ-1	**Overall – Will expected climatological changes affect whether or not communities exist that are exceptionally dependent on subsistence resources in the region of interest? Justify your answer in 4 sentences or less.**			X		The EJ impact analysis did not find prominent subsistence behaviors in the EJ ROI.
EJ-2	**Overall – Will expected climatological changes affect any identified human health impacts of the plant to EJ populations of interest? Justify your answer in 4 sentences or less.**			X		Climate related extreme events, such as flooding or high temperatures, can increase the risk of accidents if infrastructure is compromised. Further, the EJ ROI already faces burdens from other industrial activities, including the D.C. Cook Nuclear Plant. The combined effects of pollution, climate change, and the restart of Palisades operations could exacerbate the cumulative environmental burden on these communities and deepen existing health disparities but these are projected as non-significant.
EJ-3	**Overall – Will expected climatological changes influence any effect of plant activities on established resource dependencies, cultural practices, or subsistence behaviors? Justify your answer in 4 sentences or less.**			X		The EJ impact analysis did not find established resource dependencies, cultural practices, or subsistence behaviors in the EJ ROI.

	Question	Likely Increase	Likely Decrease	Stay the Same	Don't Know	Comment
Conclusion	**Overall – Will expected climatological changes affect the environmental justice building or operational impact levels assigned in Chapters 3 or 4? Potential changes to the building impact level could occur if there are long-term, persistent impacts from building activities. Considering responses to previous questions, justify your answer in 4 sentences or less.**			X		Potential climate impacts on EJ communities would exacerbate existing environmental burdens and socioeconomic challenges in the EJ ROI. However, the preparation activities for the restart of Palisades and the restart itself are expected to have minimal impact on these existing conditions and would not be long-term or persistent. Therefore, the climatological changes to the environmental baseline would not alter the not significant EJ conclusion. However, if Holtec requests a license renewal by 2031, the impacts on EJ communities due to climate change would be thoroughly reassessed, taking into account the impacts evaluated in this environmental assessment.

	Rad Impacts					
		Choose One Per Question				
	Question	**Likely Increase**	**Likely Decrease**	**Stay the Same**	**Don't Know**	**Comment**
FALSE	**FALSE**					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
	Water Resources					
FALSE	FALSE					
R-2	Will expected climatological changes affect the possibility of exposure of non-human biota to radiation from the operating facility?			x		Climatological changes are not likely to have an effect on exposure from radiation to non-human biota at Palisades, therefore, there would be no change in the radiation health impacts from non-human biota exposure discussed in the EA.
FALSE	FALSE					
R-4	Will expected climatological changes affect estimated radiation doses to non-human biota in the area of interest during the operation of the facility?			x		Climatological changes are not likely to have an effect on radiation dose of non-human biota at Palisades, therefore, there would be no change in the radiation health impacts from radiation dose to non-human biota discussed in the EA.
R-5	Will expected climatological changes affect the level of radiological environmental monitoring for the site?			x		Climatological changes are not likely to have an effect on radiological environmental monitoring at Palisades, therefore, there would be no change in the radiation health impacts from environmental monitoring discussed in the EA.
FALSE	**FALSE**					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					

	Question	Likely Increase	Likely Decrease	Stay the Same	Don't Know	Comment
FALSE	FALSE					
FALSE	**FALSE**					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	**FALSE**					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	**FALSE**					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
	Ecosystems, Biodiversity, and Ecosystem Services					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
R-5	Will expected climatological changes affect the level of radiological environmental monitoring for the site?			x		
FALSE	**FALSE**					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					

	Question	Likely Increase	Likely Decrease	Stay the Same	Don't Know	Comment
FALSE	FALSE					
FALSE	FALSE					
FALSE	**FALSE**					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	**FALSE**					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
	Indigenous Peoples, Land, and Resources					
R-1	Will expected climatological changes affect the possibility of exposure of humans to radiation from the operating facility?			x		Climatological changes are not likely to have an effect on exposure from radiation to humans at Palisades, therefore, there would be no change in the radiation health impacts to humans discussed in the EA.
FALSE	FALSE					
R-3	Will expected climatological changes affect estimated radiation doses to humans, including plant workers, in the area of interest during the operation of the facility?			x		
R-4	Will expected climatological changes affect estimated radiation doses to non-human biota in the area of interest during the operation of the facility?			x		

	Question	Likely Increase	Likely Decrease	Stay the Same	Don't Know	Comment
R-5	Will expected climatological changes affect the level of radiological environmental monitoring for the site?			x		Climatological changes are not likely to have an effect on radiological environmental monitoring at Palisades, therefore, there would be no change in the radiation health impacts from environmental monitoring discussed in the EA.
	Land Use and Land Cover Change					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
R-5	Will expected climatological changes affect the level of radiological environmental monitoring for the site?			x		Climatological changes are not likely to have an effect on radiological environmental monitoring at Palisades, therefore, there would be no change in the radiation health impacts from environmental monitoring discussed in the EA.
FALSE	**FALSE**					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	**FALSE**					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
	Rad Impacts Summary					**Summary Text**

	Question	Likely Increase	Likely Decrease	Stay the Same	Don't Know	Comment
R-1	**Overall – Will expected climatological changes affect the possibility of exposure of humans to radiation from the operating facility? Justify your answer in 4 sentences or less.**			x		Climatological changes are not likely to have an effect on exposure from radiation to humans at Palisades, therefore, there would be no change in the radiation health impacts to humans discussed in the EA. Existing radiological regulations will continue to keep workers and public safe from radiation exposures.
R-2	**Overall – Will expected climatological changes affect the possibility of exposure of non-human biota to radiation from the operating facility? Justify your answer in 4 sentences or less.**			x		Climatological changes are not likely to have an effect on exposure from radiation to non-human biota at Palisades, therefore, there would be no change in the radiation health impacts from non-human biota exposure discussed in the EA.
R-3	**Overall – Will expected climatological changes affect estimated radiation doses to humans, including plant workers, in the area of interest during the operation of the facility? Justify your answer in 4 sentences or less.**			x		Climatological changes are not likely to have an effect on radiation dose to humans at Palisades, therefore, there would be no change in the radiation health impacts to humans discussed in the EA. Existing radiological regulations will continue to keep workers and public safe from radiation exposures.
R-4	**Overall – Will expected climatological changes affect estimated radiation doses to non-human biota in the area of interest during the operation of the facility? Justify your answer in 4 sentences or less.**			x		Climatological changes are not likely to have an effect on radiation dose of non-human biota at Palisades, therefore, there would be no change in the radiation health impacts from radiation dose to non-human biota discussed in the EA.
R-5	**Overall – Will expected climatological changes affect the level of radiological environmental monitoring for the site? Justify your answer in 4 sentences or less.**			x		Environmental monitoring of radiation would not change as a result of climate change. Existing radiological regulations will continue to guide radiological environmental monitoring.

	Question	Likely Increase	Likely Decrease	Stay the Same	Don't Know	Comment
Conclusion	**Overall – Will expected climatological changes affect the radiological operational impact level assigned in Chapters 3 or 4? Considering responses to previous questions, justify your answer in 4 sentences or less:**			x		Climatological changes are not likely to have an effect on radiation health impacts. Existing radiological regulations will continue to guide radiological monitoring and thresholds.

	NonRad Health					
		Choose One Per Question				
	Question	Likely Increase	Likely Decrease	Stay the Same	Don't Know	Comment
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
	Water Resources					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
NRH-4	Will expected climatological changes affect any occupational health risks associated with plant operations?			X		
FALSE	FALSE					
	Energy Supply and Use					
FALSE	FALSE					
FALSE	FALSE					
NRH-3	Will expected climatological changes affect any health impacts from electromagnetic fields associated with plant operations?				X	
FALSE	FALSE					
FALSE	FALSE					
	Transportation					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					

	Question	Likely Increase	Likely Decrease	Stay the Same	Don't Know	Comment
NRH-5	Will expected climatological changes affect potential health impacts related to nonradiological traffic-related accidents for operations and outage workers?					NA
FALSE	**FALSE**					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	**FALSE**					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	**FALSE**					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
	Human Health					
NRH-1	Will expected climatological changes affect any health impacts from the presence of etiological agents?			X		
FALSE	FALSE					
FALSE	FALSE					
NRH-4	Will expected climatological changes affect any occupational health risks associated with plant operations?			X		
FALSE	FALSE					

	Question	Likely Increase	Likely Decrease	Stay the Same	Don't Know	Comment
FALSE	**FALSE**					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	**FALSE**					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
	Indigenous Peoples, Land, and Resources					
NRH-1	Will expected climatological changes affect any health impacts from the presence of etiological agents?			X		
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
	Land Use and Land Cover Change					
FALSE	FALSE					
NRH-2	Will expected climatological changes affect any health impacts from noise associated with plant operations?			X		
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	**FALSE**					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					

	Question	Likely Increase	Likely Decrease	Stay the Same	Don't Know	Comment
FALSE	FALSE					
FALSE	FALSE					
	Biogeochemical Cycles					
NRH-1	Will expected climatological changes affect any health impacts from the presence of etiological agents?			X		
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
	NonRad Health Summary					**Summary Text**
NRH-1	**Overall – Will expected climatological changes affect any health impacts from the presence of etiological agents? Justify your answer in 4 sentences or less.**			X		Projected changes to climate for upcoming mid-century have the potential to influence the presence of etiological agents. However, it is reasonable to expect that existing regulations protecting workers would continue, or would be modified as necessary, to be as protective as they are under current climate conditions.
NRH-2	**Overall – Will expected climatological changes affect any health impacts from noise associated with plant operations? Justify your answer in 4 sentences or less.**			X		Climatological changes are not likely to have an effect on operational noise at Palisades, therefore, there would be no change in the health impacts from noise discussed in the EA.
NRH-3	**Overall – Will expected climatological changes affect any health impacts from electromagnetic fields associated with plant operations? Justify your answer in 4 sentences or less.**				X	Impacts from EMFs due to climatological changes are uncertain. As discussed in the 2024 LR GEIS, there are no U.S. Federal standards regarding EMFs and impacts are uncertain.

	Question	Likely Increase	Likely Decrease	Stay the Same	Don't Know	Comment
NRH-4	**Overall – Will expected climatological changes affect any occupational health risks associated with plant operations? Justify your answer in 4 sentences or less.**			X		Projected changes to climate for upcoming mid-century have the potential to influence occupational health risks for Palisades operation. However, it is reasonable to expect that existing regulations protecting workers would continue, or would be modified as necessary, to be as protective as they are under current climate conditions.
NRH-5	**Overall – Will expected climatological changes affect potential health impacts related to nonradiological traffic-related accidents for operations and outage workers? Justify your answer in 4 sentences or less.**					NA
Conclusion	**Overall – Will expected climatological changes affect the nonradiological health resource operational impact level assigned in Chapters 3 or 4? Considering responses to previous questions, justify your answer in 4 sentences or less:**			X		Overall, it is expected that the predicted climatological changes would not change the nonradiological health resource impact of not significant. Potential impacts from noise, etiological agents, and occupational injuries would continue to be regulated to be protective of human health. Although there is some uncertainty around EMFs, it is expected that regulations regarding occupational and public safety would be adjusted to address nonradiological human health, as appropriate, in response to climatological changes.

Nonradioactive Waste

		Choose One Per Question				
	Question	Likely Increase	Likely Decrease	Stay the Same	Don’t Know	Comment
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
	Land Use and Land Cover Change					
NRW-1	Will expected climatological changes affect environmental impacts resulting from the generation and disposal of nonradioactive and mixed wastes from the operating facility?			X		
FALSE	FALSE					

	Question	Likely Increase	Likely Decrease	Stay the Same	Don't Know	Comment
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
	Nonradioactive Waste Impacts Summary					**Summary Text**
NRW-1	**Overall – Will expected climatological changes affect environmental impacts resulting from the generation and disposal of nonradioactive and mixed wastes from the operating facility? Justify your answer in 4 sentences or less.**			x		Climatological changes are not likely to have an effect on nonradioactive and mixed waste generation at Palisades. Changes to land-use decisions may result in changes to disposal options during operation; however, waste will continue to be managed in accordance with State and Federal regulations. It is expected that existing laws and regulations regarding waste management would continue and may be adjusted as needed to address changing conditions.
Conclusion	**Overall – Will expected climatological changes affect the nonradiological health resource operational impact level assigned in Chapters 3 or 4? Considering responses to previous questions, justify your answer in 4 sentences or less:**			x		Because nonradioactive and mixed wastes would still be subject to applicable Federal, State, and local requirements, climatological changes are unlikely to shift the impact determination discussed in the EA of not significant.

	Transportation of Rad					
		Choose One Per Question				
	Question	Likely Increase	Likely Decrease	Stay the Same	Don't Know	Comment
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
	Transportation					
T-1	Will expected climatological changes affect the radiological dose to the population in the region of interest due to transportation of radioactive materials?			x		
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					

	Question	Likely Increase	Likely Decrease	Stay the Same	Don't Know	Comment
FALSE	FALSE					
FALSE	FALSE					
	Transportation of Rad Summary					**Summary Text**
T-1	**Overall – Will expected climatological changes affect the radiological dose to the population in the region of interest due to transportation of radioactive materials? Justify your answer in 4 sentences or less.**			x		The impacts from transportation of radiological waste and spent fuel is not significant. There will be no change in the impacts due to changes in weather events. The impacts have been assessed generically, most recently in NUREG-2266 that expands the safe shipping requirements to 80 GWD/MTU for activation of material with up to 8 % enrichment. These impacts are no different than those currently assessed generically.
Conclusion	**Overall – Will expected climatological changes affect the impact level assigned to the transportation of radioactive materials in Chapters 3 or 4? Considering responses to previous questions, justify your answer in 4 sentences or less:**			x		There will be no changes in the impacts from transportation of radiological waste and spent fuel.

	Accidents					
		Choose One Per Question				
	Question	Likely Increase	Likely Decrease	Stay the Same	Don't Know	Comment
	Climate					
ACC-1	Will expected climatological changes affect the site-specific, 50th percentile atmospheric dilution factor (i.e., χ/Q) used to evaluate dose consequences from postulated design basis accidents (DBAs)?				x	Climatological changes are expected to affect the site-specific, 50th percentile atmospheric dilution factor (i.e., X/Q) used to evaluate dose consequences from postulated design basis accidents. The X/Q around the site is dependent on local meteorological conditions (wind speed, direction, and stability class). The expected variations for these parameters as a result of climate change may increase, likely leading to less stability, which would likely increase dispersion and decrease the corresponding radiological effects. However, the predominant wind direction could change such that higher X/Qs could shift along the site boundary, low-population zone, and beyond to areas with higher population densities, which would increase the impact. Therefore, the overall impact is unknown. A higher dispersion factor is more beneficial in a severe accident. Palisades used a conservative .05 percentile atmospheric dispersion factor in it's accident dose design basis accident calculation that would likely bound any negative effects regarding dispersion. Thus, the environmental impact is expected to remain not significant.

	Question	Likely Increase	Likely Decrease	Stay the Same	Don't Know	Comment
ACC-2	Will expected climatological changes affect average environmental risks of severe accidents due to either changes in severe accident probabilities or associated consequences?				x	Climatological changes might affect the average environmental risks of severe accidents because of changes in either severe accident probabilities due to an increase in the rate of severe natural phenomena and/or associated consequences due to altered patterns of atmospheric dispersion. While the potential severity of storms and other natural phenomena might increase, nuclear power plants must be designed to withstand all credible natural events at the site of concern.
ACC-3	Will expected climatological changes affect the severe accident mitigation alternative (SAMA) cost-benefit of the proposed facility?			x		Although an increase in risk could change the cost benefit values in a SAMA analysis. NRC regulations only require the SAMA analysis to be performed once. The 2024 LR GEIS Rule states, in part, that severe accident mitigation alternatives do not warrant further plant specific analysis because the demonstrated reductions in population dose risk and continued severe accident regulatory improvements substantially reduce the likelihood of finding cost-effective significant plant improvements. Palisades demonstrated the reduction in population dose risk in Table E.3-1 of the 2024 LR GEIS.
	Water Resources					

	Question	Likely Increase	Likely Decrease	Stay the Same	Don't Know	Comment
ACC-1	Will expected climatological changes affect the site-specific, 50th percentile atmospheric dilution factor (i.e., χ/Q) used to evaluate dose consequences from postulated design basis accidents (DBAs)?			x		
ACC-2	Will expected climatological changes affect average environmental risks of severe accidents due to either changes in severe accident probabilities or associated consequences?			x		
ACC-3	Will expected climatological changes affect the severe accident mitigation alternative (SAMA) cost-benefit of the proposed facility?			x		
FALSE	**FALSE**					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
	Transportation					
FALSE	FALSE					
ACC-2	Will expected climatological changes affect average environmental risks of severe accidents due to either changes in severe accident probabilities or associated consequences?			x		
ACC-3	Will expected climatological changes affect the severe accident mitigation alternative (SAMA) cost-benefit of the proposed facility?			x		
	Agriculture					
FALSE	FALSE					

	Question	Likely Increase	Likely Decrease	Stay the Same	Don't Know	Comment
ACC-2	Will expected climatological changes affect average environmental risks of severe accidents due to either changes in severe accident probabilities or associated consequences?			x		
ACC-3	Will expected climatological changes affect the severe accident mitigation alternative (SAMA) cost-benefit of the proposed facility?			x		
FALSE	**FALSE**					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
	Ecosystems, Biodiversity, and Ecosystem Services					
FALSE	FALSE					
ACC-2	Will expected climatological changes affect average environmental risks of severe accidents due to either changes in severe accident probabilities or associated consequences?			x		
ACC-3	Will expected climatological changes affect the severe accident mitigation alternative (SAMA) cost-benefit of the proposed facility?			x		
FALSE	**FALSE**					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	**FALSE**					
FALSE	FALSE					
FALSE	FALSE					

	Question	Likely Increase	Likely Decrease	Stay the Same	Don't Know	Comment
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
	Land Use and Land Cover Change					
FALSE	FALSE					
ACC-2	Will expected climatological changes affect average environmental risks of severe accidents due to either changes in severe accident probabilities or associated consequences?			x		
ACC-3	Will expected climatological changes affect the severe accident mitigation alternative (SAMA) cost-benefit of the proposed facility?			x		
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
FALSE	FALSE					
	Accidents Summary					**Summary Text**

	Question	Likely Increase	Likely Decrease	Stay the Same	Don't Know	Comment
ACC-1	**Overall – Will expected climatological changes affect the site-specific, 50th percentile atmospheric dilution factor (i.e., χ/Q) used to evaluate dose consequences from postulated design basis accidents (DBAs)? Justify your answer in 4 sentences or less.**			x		Expected climate change affects are not expected to change the overall median X/Q. The median is used for these calculations to limit the affect of extreme weather conditions.
ACC-2	**Overall – Will expected climatological changes affect average environmental risks of severe accidents due to either changes in severe accident probabilities or associated consequences? Justify your answer in 4 sentences or less.**			x		The impacts from severve accidents are SMALL. This is due to design methodologies that reduce potential emissions during a hypothetical accident conditions. These features are engineered into the design of the plant and will not be impacted by changes in climate.
ACC-3	**Overall – Will expected climatological changes affect the severe accident mitigation alternative (SAMA) cost-benefit of the proposed facility? Justify your answer in 4 sentences or less.**			x		The potential impacts from SAMAs will not change the cost-benefit results. This is due to design methodologies considered for preventing hypothetical accident conditions and their consequences. These features are engineered into the design of the plant and will not be impacted by changes in climate.
Conclusion	**Overall – Will expected climatological changes affect the accident impact level assigned in Chapters 3 or 4? Considering responses to previous questions, justify your answer in 4 sentences or less:**			x		There will be no change to the impact.