SALTON SEA RESTORATION ALTERNATIVES

BUREAU OF RECLAMATION & SALTON SEA AUTHORITY

DRAFT April 13, 1999

PHASE	DESCRIPTION	
PHASE ONE ALTERNATIVES *Projects with a design life of at least 14 years and which address potential inflows of 1.3 MAF to 1 MAF per year.*	No Action	
	Concentration Pond(s) SW Shore	
	Concentration Pond(s) & Enhanced Evaporation System (EES)	
	Enhanced Evaporation System E of Bombay Beach	
	Enhanced Evaporation System @ Test Base Vicinity	
PHASE ONE COMMON ACTIONS *Common actions will be a component of each phase one alternative (above).*	Fish Harvesting	Designed to withdraw phosphates/nutrients from the Sea.
	Improved Recreational Facilities	Improve existing marinas and boat launches.
	Flood Flows via Existing or New Facilities	Will only be useful in flood year(s) and if capacity is available in the Sea and existing canal(s) or new facilities.
	Construct Dike or Moat Around Mullet Island	Designed to ensure roosting habitat does not "connect" to mainland.
	Shoreline Clean-Up	Clean up of dead fish and other debris around the shores of the Sea.
PHASE ONE CONDITIONAL ACTIONS *Conditional actions have been developed to respond to new information and changing ecological conditions.*		**Trigger Mechanism**
	Perimeter Pupfish Channel	May be necessary w/ construction of ponds to facilitate breeding (pending scientific study).
	Nesting/Roosting Structures	If elevation reductions expose existing nesting/roosting areas.
	Refuge Dike System	If the fishery cannot be maintained due to salinity/water quality degradation, a series of dikes are constructed near the refuge to maintain a fishery.
PHASE TWO ALTERNATIVES *Project components with a design life of greater than 100 years and which address potential inflows of 1.3 MAF to .8 MAF per year.*	No Action	
	Export to Large Enhanced Evaporation System (EES)	
	Export to Gulf of California	
	Export to Pacific (San Diego)	
	Export to Danby?	
	Import through Yuma	
	Import from San Diego w/ Water Treatment Plant	
PHASE TWO CONDITIONAL ACTIONS *Conditional actions have been developed to respond to new information and changing ecological conditions.*		**Trigger Mechanism**
	Wetlands, Sediment Traps	If the New River Wetlands Demonstration Project proves fruitful, expanded sediment traps/wetlands are installed along the rivers.
	Halophytes/Soil Stabilization	If the Sea's elevation drops considerably and airborne particulates become an issue.

Salton Sea Restoration Draft Alternative 1A as of 4/14/99

Alternative	Phase I (Projects with a design life of at least 14 years. Projects which address potential flows of 1.3 MAF to 1.0 MAF per year)		Phase II (Projects with a design life of greater than 100 years. Projects which address potential inflows of 1.3 MAF to 0.8 MAF per year)	
	Project Component(s)	**Performance (years)**	**Project Component(s)**	**Performance (years)/Remark**
1A	Concentration Ponds	14 (includes a 3 yr start up period, 4 yr construction period, and a 7 yr life span of the ponds)	Export to Large EES (15 mi^2)	93 or greater (Phase II construction to begin 6 yrs into Phase I so that Phase II become operational at end of Phase I). Import from Yuma is viewed more as a program alternative. This potential import is years out. The EES containment areas will be treated like landfills and covered with clean soil when capacity is met.
			Import through Yuma	
	Phase I Common Actions:			
	Action	**Performance/Duration**	**Remark/Trigger(s)**	
	Flood Flow via existing or new facilities	Continue through Phases I and II or until the need no longer exists	Will only be useful in flood year(s) and if capacity is available in the Sea or transfer canal.	
	Fish Harvesting	Continue through Phases I and II or until the need no longer exists (i.e., other methods of nutrient reduction are in place through river wetlands, etc.)	Provide method for phosphates/nutrients removal from the Sea as well as economic development opportunities.	
	Shoreline Cleanup	Continue through Phases I and II or until the need no longer exists	Cleanup of dead fish and debris around the shores of the Sea. Enhances the aesthetics of the Sea, reduces odor, and provides economic development opportunities.	
	Improving Recreational Features	Continue through Phase I	Improve existing marines and boat launches.	
	***Phase I Conditional Actions** (actions developed to respond to new information and changing ecological conditions during Phase I activities):*			
	Refuge Dike System	Upon implementation, will continue through Phases I and II	To be implemented based on a reduced elevation and/or diminishing water quality of the Sea. Maintain a fresher water source than that existing at the time of implementation and a stable elevation for migratory and residential birds.	
	Nesting/Roosting Structures	Upon implementation, will continue through Phases I and II	To be implemented as elevation of the Sea decreases and current nesting/roosting locations become land locked. Will provide nesting/roosting islands and/or platforms for migratory and residential birds.	
	Perimeter Pupfish Channel	Upon implementation, will continue through Phases I and II	May be necessary to facilitate breeding based on scientific studies.	
	***Phase II Conditional Actions** (actions developed to respond to new information and changing ecological conditions during Phase II activities):*			
	Halophytes/Soil Stabilization	93 or greater	Dependant upon decrease in water elevation. To be implemented if the Sea's elevation drops considerably and airborne particulates become an issue. Could also provide economic development opportunities.	
	Sediment Traps to Enhance River Water Quality	93 or greater	If the New River Wetlands Demonstration Project proves fruitful, expanded sediment traps/wetlands will be installed along the rivers. Will assist in reducing the nutrient load of the Sea.	
	Permanent Recreational Features	93 or greater	As the water elevation becomes stable, permanent marinas, boat ramps, docks, will be constructed to enhance recreational uses of the Sea.	

Salton Sea Restoration Draft Alternative 1B as of 4/14/99

Alternative	Phase I (Projects with a design life of at least 14 years. Projects which address potential flows of 1.3 MAF to 1.0 MAF per year)		Phase II (Projects with a design life of greater than 100 years. Projects which address potential inflows of 1.3 MAF to 0.8 MAF per year)	
	Project Component(s)	**Performance (years)**	**Project Component(s)**	**Performance (years)/Remark**
1B	Concentration Ponds	14 (includes a 3 yr start up period, 4 yr construction period, and a 7 yr life span of the ponds)	Export to Large EES (15 mi^2)	93 or greater (Phase II construction to begin 6 yrs into Phase I so that Phase II become operational at end of Phase I). Consider placing water treatment plant on San Diego side of mountain range for potential future San Diego use. The EES containment areas will be treated like landfills and covered with clean soil when capacity is met.
			Import from San Diego w/Water Treatment Plant	

Phase I Common Actions:

Action	Performance/Duration	Remark/Trigger(s)
Flood Flow via existing or new facilities	Continue through Phases I and II or until the need no longer exists	Will only be useful in flood year(s) and if capacity is available in the Sea or transfer canal.
Fish Harvesting	Continue through Phases I and II or until the need no longer exists (i.e., other methods of nutrient reduction are in place through river wetlands, etc.)	Provide method for phosphates/nutrients removal from the Sea as well as economic development opportunities.
Shoreline Cleanup	Continue through Phases I and II or until the need no longer exists	Cleanup of dead fish and debris around the shores of the Sea. Enhances the aesthetics of the Sea, reduces odor, and provides economic development opportunities.
Improving Recreational Features	Continue through Phase I	Improve existing marines and boat launches.

***Phase I Conditional Actions** (actions developed to respond to new information and changing ecological conditions during Phase I activities):*

Refuge Dike System	Upon implementation, will continue through Phases I and II	To be implemented based on a reduced elevation and/or diminishing water quality of the Sea. Maintain a fresher water source than that existing at the time of implementation and a stable elevation for migratory and residential birds.
Nesting/Roosting Structures	Upon implementation, will continue through Phases I and II	To be implemented as elevation of the Sea decreases and current nesting/roosting locations become land locked. Will provide nesting/roosting islands and/or platforms for migratory and residential birds.
Perimeter Pupfish Channel	Upon implementation, will continue through Phases I and II	May be necessary to facilitate breeding based on scientific studies.

***Phase II Conditional Actions** (actions developed to respond to new information and changing ecological conditions during Phase II activities):*

Halophytes/Soil Stabilization	93 or greater	Dependant upon decrease in water elevation. To be implemented if the Sea's elevation drops considerably and airborne particulates become an issue. Could also provide economic development opportunities.
Sediment Traps to Enhance River Water Quality	93 or greater	If the New River Wetlands Demonstration Project proves fruitful, expanded sediment traps/wetlands will be installed along the rivers. Will assist in reducing the nutrient load of the Sea.
Permanent Recreational Features	93 or greater	As the water elevation becomes stable, permanent marinas, boat ramps, docks, will be constructed to enhance recreational uses of the Sea.

Salton Sea Restoration Draft Alternative 1C as of 4/14/99

Alternative	Phase I (Projects with a design life of at least 14 years. Projects which address potential flows of 1.3 MAF to 1.0 MAF per year)		Phase II (Projects with a design life of greater than 100 years. Projects which address potential inflows of 1.3 MAF to 0.8 MAF per year)	
	Project Component(s)	**Performance (years)**	**Project Component(s)**	**Performance (years)/Remark**
1C	Concentration Ponds	14 (includes a 3 yr start up period, 4 yr construction period, and a 7 yr life span of the ponds)	Export to the Gulf of California	93 or greater (Phase II construction to begin 6 yrs into Phase I so that Phase II become operational at end of Phase I). Import from Yuma is viewed more as a program alternative. This potential import is years out.
			Import from Yuma	
	Phase I Common Actions:			
	Action	**Performance/Duration**	**Remark/Trigger(s)**	
	Flood Flow via existing or new facilities	Continue through Phases I and II or until the need no longer exists	Will only be useful in flood year(s) and if capacity is available in the Sea or transfer canal.	
	Fish Harvesting	Continue through Phases I and II or until the need no longer exists (i.e., other methods of nutrient reduction are in place through river wetlands, etc.)	Provide method for phosphates/nutrients removal from the Sea as well as economic development opportunities.	
	Shoreline Cleanup	Continue through Phases I and II or until the need no longer exists	Cleanup of dead fish and debris around the shores of the Sea. Enhances the aesthetics of the Sea, reduces odor, and provides economic development opportunities.	
	Improving Recreational Features	Continue through Phase I	Improve existing marines and boat launches.	
	***Phase I Conditional Actions** (actions developed to respond to new information and changing ecological conditions during Phase I activities):*			
	Refuge Dike System	Upon implementation, will continue through Phases I and II	To be implemented based on a reduced elevation and/or diminishing water quality of the Sea. Maintain a fresher water source than that existing at the time of implementation and a stable elevation for migratory and residential birds.	
	Nesting/Roosting Structures	Upon implementation, will continue through Phases I and II	To be implemented as elevation of the Sea decreases and current nesting/roosting locations become land locked. Will provide nesting/roosting islands and/or platforms for migratory and residential birds.	
	Perimeter Pupfish Channel	Upon implementation, will continue through Phases I and II	May be necessary to facilitate breeding based on scientific studies.	
	***Phase II Conditional Actions** (actions developed to respond to new information and changing ecological conditions during Phase II activities):*			
	Halophytes/Soil Stabilization	93 or greater	Dependant upon decrease in water elevation. To be implemented if the Sea's elevation drops considerably and airborne particulates become an issue. Could also provide economic development opportunities.	
	Sediment Traps to Enhance River Water Quality	93 or greater	If the New River Wetlands Demonstration Project proves fruitful, expanded sediment traps/wetlands will be installed along the rivers. Will assist in reducing the nutrient load of the Sea.	
	Permanent Recreational Features	93 or greater	As the water elevation becomes stable, permanent marinas, boat ramps, docks, will be constructed to enhance recreational uses of the Sea.	

Salton Sea Restoration Draft Alternative 1D as of 4/14/99

Alternative	Phase I (Projects with a design life of at least 14 years. Projects which address potential flows of 1.3 MAF to 1.0 MAF per year)		Phase II (Projects with a design life of greater than 100 years. Projects which address potential inflows of 1.3 MAF to 0.8 MAF per year)	
	Project Component(s)	**Performance (years)**	**Project Component(s)**	**Performance (years)/Remark**
1D	Concentration Ponds	14 (includes a 3 yr start up period, 4 yr construction period, and a 7 yr life span of the ponds)	Export to Gulf of California Import from San Diego w/Water Treatment Plan	93 or greater (Phase II construction to begin 6 yrs into Phase I so that Phase II become operational at end of Phase I)
	Phase I Common Actions:			
	Action	**Performance/Duration**	**Remark/Trigger(s)**	
	Flood Flow via existing or new facilities	Continue through Phases I and II or until the need no longer exists	Will only be useful in flood year(s) and if capacity is available in the Sea or transfer canal.	
	Fish Harvesting	Continue through Phases I and II or until the need no longer exists (i.e., other methods of nutrient reduction are in place through river wetlands, etc.)	Provide method for phosphates/nutrients removal from the Sea as well as economic development opportunities.	
	Shoreline Cleanup	Continue through Phases I and II or until the need no longer exists	Cleanup of dead fish and debris around the shores of the Sea. Enhances the aesthetics of the Sea, reduces odor, and provides economic development opportunities.	
	Improving Recreational Features	Continue through Phase I	Improve existing marines and boat launches.	
	***Phase I Conditional Actions** (actions developed to respond to new information and changing ecological conditions during Phase I activities):*			
	Refuge Dike System	Upon implementation, will continue through Phases I and II	To be implemented based on a reduced elevation and/or diminishing water quality of the Sea. Maintain a fresher water source than that existing at the time of implementation and a stable elevation for migratory and residential birds.	
	Nesting/Roosting Structures	Upon implementation, will continue through Phases I and II	To be implemented as elevation of the Sea decreases and current nesting/roosting locations become land locked. Will provide nesting/roosting islands and/or platforms for migratory and residential birds.	
	Perimeter Pupfish Channel	Upon implementation, will continue through Phases I and II	May be necessary to facilitate breeding based on scientific studies.	
	***Phase II Conditional Actions** (actions developed to respond to new information and changing ecological conditions during Phase II activities):*			
	Halophytes/Soil Stabilization	93 or greater	Dependant upon decrease in water elevation. To be implemented if the Sea's elevation drops considerably and airborne particulates become an issue. Could also provide economic development opportunities.	
	Sediment Traps to Enhance River Water Quality	93 or greater	If the New River Wetlands Demonstration Project proves fruitful, expanded sediment traps/wetlands will be installed along the rivers. Will assist in reducing the nutrient load of the Sea.	
	Permanent Recreational Features	93 or greater	As the water elevation becomes stable, permanent marinas, boat ramps, docks, will be constructed to enhance recreational uses of the Sea.	

Salton Sea Restoration Draft Alternative 1E as of 4/14/99

Alternative	Phase I (Projects with a design life of at least 14 years. Projects which address potential flows of 1.3 MAF to 1.0 MAF per year)		Phase II (Projects with a design life of greater than 100 years. Projects which address potential inflows of 1.3 MAF to 0.8 MAF per year)	
	Project Component(s)	**Performance (years)**	**Project Component(s)**	**Performance (years)/Remark**
1E	Concentration Ponds	14 (includes a 3 yr start up period, 4 yr construction period, and a 7 yr life span of the ponds)	Export to San Diego	93 or greater (Phase II construction to begin 6 yrs into Phase I so that Phase II become operational at end of Phase I). Import from Yuma is viewed more as a program alternative. This potential import is years out.
			Import through Yuma	
	Phase I Common Actions:			
	Action	**Performance/Duration**	**Remark/Trigger(s)**	
	Flood Flow via existing or new facilities	Continue through Phases I and II or until the need no longer exists	Will only be useful in flood year(s) and if capacity is available in the Sea or transfer canal.	
	Fish Harvesting	Continue through Phases I and II or until the need no longer exists (i.e., other methods of nutrient reduction are in place through river wetlands, etc.)	Provide method for phosphates/nutrients removal from the Sea as well as economic development opportunities.	
	Shoreline Cleanup	Continue through Phases I and II or until the need no longer exists	Cleanup of dead fish and debris around the shores of the Sea. Enhances the aesthetics of the Sea, reduces odor, and provides economic development opportunities.	
	Improving Recreational Features	Continue through Phase I	Improve existing marines and boat launches.	
	***Phase I Conditional Actions** (actions developed to respond to new information and changing ecological conditions during Phase I activities):*			
	Refuge Dike System	Upon implementation, will continue through Phases I and II	To be implemented based on a reduced elevation and/or diminishing water quality of the Sea. Maintain a fresher water source than that existing at the time of implementation and a stable elevation for migratory and residential birds.	
	Nesting/Roosting Structures	Upon implementation, will continue through Phases I and II	To be implemented as elevation of the Sea decreases and current nesting/roosting locations become land locked. Will provide nesting/roosting islands and/or platforms for migratory and residential birds.	
	Perimeter Pupfish Channel	Upon implementation, will continue through Phases I and II	May be necessary to facilitate breeding based on scientific studies.	
	***Phase II Conditional Actions** (actions developed to respond to new information and changing ecological conditions during Phase II activities):*			
	Halophytes/Soil Stabilization	93 or greater	Dependant upon decrease in water elevation. To be implemented if the Sea's elevation drops considerably and airborne particulates become an issue. Could also provide economic development opportunities.	
	Sediment Traps to Enhance River Water Quality	93 or greater	If the New River Wetlands Demonstration Project proves fruitful, expanded sediment traps/wetlands will be installed along the rivers. Will assist in reducing the nutrient load of the Sea.	
	Permanent Recreational Features	93 or greater	As the water elevation becomes stable, permanent marinas, boat ramps, docks, will be constructed to enhance recreational uses of the Sea.	

Salton Sea Restoration Draft Alternative 1F as of 4/14/99

Alternative	Phase I (Projects with a design life of at least 14 years. Projects which address potential flows of 1.3 MAF to 1.0 MAF per year)		Phase II (Projects with a design life of greater than 100 years. Projects which address potential inflows of 1.3 MAF to 0.8 MAF per year)	
	Project Component(s)	**Performance (years)**	**Project Component(s)**	**Performance (years)/Remark**
1F	Concentration Ponds	14 (includes a 3 yr start up period, 4 yr construction period, and a 7 yr life span of the ponds)	Export to San Diego	93 or greater (Phase II construction to begin 6 yrs into Phase I so that Phase II become operational at end of Phase I). Consider placing water treatment plant on San Diego side of mountain range for potential future San Diego use.
			Import from San Diego w/Water Treatment Plant	
	Phase I Common Actions:			
	Action	**Performance/Duration**	**Remark/Trigger(s)**	
	Flood Flow via existing or new facilities	Continue through Phases I and II or until the need no longer exists	Will only be useful in flood year(s) and if capacity is available in the Sea or transfer canal.	
	Fish Harvesting	Continue through Phases I and II or until the need no longer exists (i.e., other methods of nutrient reduction are in place through river wetlands, etc.)	Provide method for phosphates/nutrients removal from the Sea as well as economic development opportunities.	
	Shoreline Cleanup	Continue through Phases I and II or until the need no longer exists	Cleanup of dead fish and debris around the shores of the Sea. Enhances the aesthetics of the Sea, reduces odor, and provides economic development opportunities.	
	Improving Recreational Features	Continue through Phase I	Improve existing marines and boat launches.	
	***Phase I Conditional Actions** (actions developed to respond to new information and changing ecological conditions during Phase I activities):*			
	Refuge Dike System	Upon implementation, will continue through Phases I and II	To be implemented based on a reduced elevation and/or diminishing water quality of the Sea. Maintain a fresher water source than that existing at the time of implementation and a stable elevation for migratory and residential birds.	
	Nesting/Roosting Structures	Upon implementation, will continue through Phases I and II	To be implemented as elevation of the Sea decreases and current nesting/roosting locations become land locked. Will provide nesting/roosting islands and/or platforms for migratory and residential birds.	
	Perimeter Pupfish Channel	Upon implementation, will continue through Phases I and II	May be necessary to facilitate breeding based on scientific studies.	
	***Phase II Conditional Actions** (actions developed to respond to new information and changing ecological conditions during Phase II activities):*			
	Halophytes/Soil Stabilization	93 or greater	Dependant upon decrease in water elevation. To be implemented if the Sea's elevation drops considerably and airborne particulates become an issue. Could also provide economic development opportunities.	
	Sediment Traps to Enhance River Water Quality	93 or greater	If the New River Wetlands Demonstration Project proves fruitful, expanded sediment traps/wetlands will be installed along the rivers. Will assist in reducing the nutrient load of the Sea.	
	Permanent Recreational Features	93 or greater	As the water elevation becomes stable, permanent marinas, boat ramps, docks, will be constructed to enhance recreational uses of the Sea.	

Salton Sea Restoration Draft Alternative 2A as of 4/14/99

Alternative	Phase I (Projects with a design life of at least 14 years. Projects which address potential flows of 1.3 MAF to 1.0 MAF per year)		Phase II (Projects with a design life of greater than 100 years. Projects which address potential inflows of 1.3 MAF to 0.8 MAF per year)	
	Project Component(s)	**Performance (years)**	**Project Component(s)**	**Performance (years)/Remark**
2A	Concentration Ponds plus Small EES (6 mi^2)	14 (includes a 3 yr start up period, 4 yr construction period, and a 7 yr life span of the ponds)	Export to Large EES (15 mi^2)	93 or greater (Phase II construction to begin 6 yrs into Phase I so that Phase II become operational at end of Phase I). Import from Yuma is viewed more as a program alternative. This potential import is years out. The EES containment areas will be treated like landfills and covered with clean soil when capacity is met.
			Import through Yuma	
	Phase I Common Actions:			
	Action	**Performance/Duration**	**Remark/Trigger(s)**	
	Flood Flow via existing or new facilities	Continue through Phases I and II or until the need no longer exists	Will only be useful in flood year(s) and if capacity is available in the Sea or transfer canal.	
	Fish Harvesting	Continue through Phases I and II or until the need no longer exists (i.e., other methods of nutrient reduction are in place through river wetlands, etc.)	Provide method for phosphates/nutrients removal from the Sea as well as economic development opportunities.	
	Shoreline Cleanup	Continue through Phases I and II or until the need no longer exists	Cleanup of dead fish and debris around the shores of the Sea. Enhances the aesthetics of the Sea, reduces odor, and provides economic development opportunities.	
	Improving Recreational Features	Continue through Phase I	Improve existing marines and boat launches.	
	Phase I Conditional Actions *(actions developed to respond to new information and changing ecological conditions during Phase I activities):*			
	Refuge Dike System	Upon implementation, will continue through Phases I and II	To be implemented based on a reduced elevation and/or diminishing water quality of the Sea. Maintain a fresher water source than that existing at the time of implementation and a stable elevation for migratory and residential birds.	
	Nesting/Roosting Structures	Upon implementation, will continue through Phases I and II	To be implemented as elevation of the Sea decreases and current nesting/roosting locations become land locked. Will provide nesting/roosting islands and/or platforms for migratory and residential birds.	
	Perimeter Pupfish Channel	Upon implementation, will continue through Phases I and II	May be necessary to facilitate breeding based on scientific studies.	
	Phase II Conditional Actions *(actions developed to respond to new information and changing ecological conditions during Phase II activities):*			
	Halophytes/Soil Stabilization	93 or greater	Dependant upon decrease in water elevation. To be implemented if the Sea's elevation drops considerably and airborne particulates become an issue. Could also provide economic development opportunities.	
	Sediment Traps to Enhance River Water Quality	93 or greater	If the New River Wetlands Demonstration Project proves fruitful, expanded sediment traps/wetlands will be installed along the rivers. Will assist in reducing the nutrient load of the Sea.	
	Permanent Recreational Features	93 or greater	As the water elevation becomes stable, permanent marinas, boat ramps, docks, will be constructed to enhance recreational uses of the Sea.	

Salton Sea Restoration Draft Alternative 2B as of 4/14/99

Alternative	Phase I (Projects with a design life of at least 14 years. Projects which address potential flows of 1.3 MAF to 1.0 MAF per year)		Phase II (Projects with a design life of greater than 100 years. Projects which address potential inflows of 1.3 MAF to 0.8 MAF per year)	
	Project Component(s)	**Performance (years)**	**Project Component(s)**	**Performance (years)/Remark**
2B	Concentration Ponds plus Small EES (6 mi^2)	14 (includes a 3 yr start up period, 4 yr construction period, and a 7 yr life span of the ponds)	Export to Large EES (15 mi^2)	93 or greater (Phase II construction to begin 6 yrs into Phase I so that Phase II become operational at end of Phase I). Consider placing water treatment plant on San Diego side of mountain range for potential future San Diego use. The EES containment areas will be treated like landfills and covered with clean soil when capacity is met.
			Import from San Diego w/Water Treatment Plant	
	Phase I Common Actions:			
	Action	**Performance/Duration**	**Remark/Trigger(s)**	
	Flood Flow via existing or new facilities	Continue through Phases I and II or until the need no longer exists	Will only be useful in flood year(s) and if capacity is available in the Sea or transfer canal.	
	Fish Harvesting	Continue through Phases I and II or until the need no longer exists (i.e., other methods of nutrient reduction are in place through river wetlands, etc.)	Provide method for phosphates/nutrients removal from the Sea as well as economic development opportunities.	
	Shoreline Cleanup	Continue through Phases I and II or until the need no longer exists	Cleanup of dead fish and debris around the shores of the Sea. Enhances the aesthetics of the Sea, reduces odor, and provides economic development opportunities.	
	Improving Recreational Features	Continue through Phase I	Improve existing marines and boat launches.	
	***Phase I Conditional Actions** (actions developed to respond to new information and changing ecological conditions during Phase I activities):*			
	Refuge Dike System	Upon implementation, will continue through Phases I and II	To be implemented based on a reduced elevation and/or diminishing water quality of the Sea. Maintain a fresher water source than that existing at the time of implementation and a stable elevation for migratory and residential birds.	
	Nesting/Roosting Structures	Upon implementation, will continue through Phases I and II	To be implemented as elevation of the Sea decreases and current nesting/roosting locations become land locked. Will provide nesting/roosting islands and/or platforms for migratory and residential birds.	
	Perimeter Pupfish Channel	Upon implementation, will continue through Phases I and II	May be necessary to facilitate breeding based on scientific studies.	
	***Phase II Conditional Actions** (actions developed to respond to new information and changing ecological conditions during Phase II activities):*			
	Halophytes/Soil Stabilization	93 or greater	Dependant upon decrease in water elevation. To be implemented if the Sea's elevation drops considerably and airborne particulates become an issue. Could also provide economic development opportunities.	
	Sediment Traps to Enhance River Water Quality	93 or greater	If the New River Wetlands Demonstration Project proves fruitful, expanded sediment traps/wetlands will be installed along the rivers. Will assist in reducing the nutrient load of the Sea.	
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Salton Sea Restoration Draft Alternative 2C as of 4/14/99

Alternative	Phase I (Projects with a design life of at least 14 years. Projects which address potential flows of 1.3 MAF to 1.0 MAF per year)		Phase II (Projects with a design life of greater than 100 years. Projects which address potential inflows of 1.3 MAF to 0.8 MAF per year)	
	Project Component(s)	**Performance (years)**	**Project Component(s)**	**Performance (years)/Remark**
2C	Concentration Ponds plus Small EES (6 mi^2)	14 (includes a 3 yr start up period, 4 yr construction period, and a 7 yr life span of the ponds)	Export to Gulf of California	93 or greater (Phase II construction to begin 6 yrs into Phase I so that Phase II become operational at end of Phase I). Import from Yuma is viewed more as a program alternative. This potential import is years out.
			Import through Yuma	
	Phase I Common Actions:			
	Action	**Performance/Duration**	**Remark/Trigger(s)**	
	Flood Flow via existing or new facilities	Continue through Phases I and II or until the need no longer exists	Will only be useful in flood year(s) and if capacity is available in the Sea or transfer canal.	
	Fish Harvesting	Continue through Phases I and II or until the need no longer exists (i.e., other methods of nutrient reduction are in place through river wetlands, etc.)	Provide method for phosphates/nutrients removal from the Sea as well as economic development opportunities.	
	Shoreline Cleanup	Continue through Phases I and II or until the need no longer exists	Cleanup of dead fish and debris around the shores of the Sea. Enhances the aesthetics of the Sea, reduces odor, and provides economic development opportunities.	
	Improving Recreational Features	Continue through Phase I	Improve existing marines and boat launches.	
	***Phase I Conditional Actions** (actions developed to respond to new information and changing ecological conditions during Phase I activities):*			
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	***Phase II Conditional Actions** (actions developed to respond to new information and changing ecological conditions during Phase II activities):*			
	Halophytes/Soil Stabilization	93 or greater	Dependant upon decrease in water elevation. To be implemented if the Sea's elevation drops considerably and airborne particulates become an issue. Could also provide economic development opportunities.	
	Sediment Traps to Enhance River Water Quality	93 or greater	If the New River Wetlands Demonstration Project proves fruitful, expanded sediment traps/wetlands will be installed along the rivers. Will assist in reducing the nutrient load of the Sea.	
	Permanent Recreational Features	93 or greater	As the water elevation becomes stable, permanent marinas, boat ramps, docks, will be constructed to enhance recreational uses of the Sea.	

Salton Sea Restoration Draft Alternative 2D as of 4/14/99

Alternative	Phase I (Projects with a design life of at least 14 years. Projects which address potential flows of 1.3 MAF to 1.0 MAF per year)		Phase II (Projects with a design life of greater than 100 years. Projects which address potential inflows of 1.3 MAF to 0.8 MAF per year)	
	Project Component(s)	**Performance (years)**	**Project Component(s)**	**Performance (years)/Remark**
2D	Concentration Ponds plus Small EES (6 mi^2)	14 (includes a 3 yr start up period, 4 yr construction period, and a 7 yr life span of the ponds)	Export to Gulf of California	93 or greater (Phase II construction to begin 6 yrs into Phase I so that Phase II become operational at end of Phase I). Consider placing water treatment plant on San Diego side of mountain range for potential future San Diego use.
			Import from San Diego w/Water Treatment Plan	
	Phase I Common Actions:			
	Action	**Performance/Duration**	**Remark/Trigger(s)**	
	Flood Flow via existing or new facilities	Continue through Phases I and II or until the need no longer exists	Will only be useful in flood year(s) and if capacity is available in the Sea or transfer canal.	
	Fish Harvesting	Continue through Phases I and II or until the need no longer exists (i.e., other methods of nutrient reduction are in place through river wetlands, etc.)	Provide method for phosphates/nutrients removal from the Sea as well as economic development opportunities.	
	Shoreline Cleanup	Continue through Phases I and II or until the need no longer exists	Cleanup of dead fish and debris around the shores of the Sea. Enhances the aesthetics of the Sea, reduces odor, and provides economic development opportunities.	
	Improving Recreational Features	Continue through Phase I	Improve existing marines and boat launches.	
	***Phase I Conditional Actions** (actions developed to respond to new information and changing ecological conditions during Phase I activities):*			
	Refuge Dike System	Upon implementation, will continue through Phases I and II	To be implemented based on a reduced elevation and/or diminishing water quality of the Sea. Maintain a fresher water source than that existing at the time of implementation and a stable elevation for migratory and residential birds.	
	Nesting/Roosting Structures	Upon implementation, will continue through Phases I and II	To be implemented as elevation of the Sea decreases and current nesting/roosting locations become land locked. Will provide nesting/roosting islands and/or platforms for migratory and residential birds.	
	Perimeter Pupfish Channel	Upon implementation, will continue through Phases I and II	May be necessary to facilitate breeding based on scientific studies.	
	***Phase II Conditional Actions** (actions developed to respond to new information and changing ecological conditions during Phase II activities):*			
	Halophytes/Soil Stabilization	93 or greater	Dependant upon decrease in water elevation. To be implemented if the Sea's elevation drops considerably and airborne particulates become an issue. Could also provide economic development opportunities.	
	Sediment Traps to Enhance River Water Quality	93 or greater	If the New River Wetlands Demonstration Project proves fruitful, expanded sediment traps/wetlands will be installed along the rivers. Will assist in reducing the nutrient load of the Sea.	
	Permanent Recreational Features	93 or greater	As the water elevation becomes stable, permanent marinas, boat ramps, docks, will be constructed to enhance recreational uses of the Sea.	

Salton Sea Restoration Draft Alternative 2E as of 4/14/99

Alternative	Phase I (Projects with a design life of at least 14 years. Projects which address potential flows of 1.3 MAF to 1.0 MAF per year)		Phase II (Projects with a design life of greater than 100 years. Projects which address potential inflows of 1.3 MAF to 0.8 MAF per year)	
	Project Component(s)	**Performance (years)**	**Project Component(s)**	**Performance (years)/Remark**
2E	Concentration Ponds plus Small EES (6 mi^2)	14 (includes a 3 yr start up period, 4 yr construction period, and a 7 yr life span of the ponds)	Export to San Diego	93 or greater (Phase II construction to begin 6 yrs into Phase I so that Phase II become operational at end of Phase I). Import from Yuma is viewed more as a program alternative. This potential import is years out.
			Import through Yuma	
	Phase I Common Actions:			
	Action	**Performance/Duration**	**Remark/Trigger(s)**	
	Flood Flow via existing or new facilities	Continue through Phases I and II or until the need no longer exists	Will only be useful in flood year(s) and if capacity is available in the Sea or transfer canal.	
	Fish Harvesting	Continue through Phases I and II or until the need no longer exists (i.e., other methods of nutrient reduction are in place through river wetlands, etc.)	Provide method for phosphates/nutrients removal from the Sea as well as economic development opportunities.	
	Shoreline Cleanup	Continue through Phases I and II or until the need no longer exists	Cleanup of dead fish and debris around the shores of the Sea. Enhances the aesthetics of the Sea, reduces odor, and provides economic development opportunities.	
	Improving Recreational Features	Continue through Phase I	Improve existing marines and boat launches.	
	***Phase I Conditional Actions** (actions developed to respond to new information and changing ecological conditions during Phase I activities):*			
	Refuge Dike System	Upon implementation, will continue through Phases I and II	To be implemented based on a reduced elevation and/or diminishing water quality of the Sea. Maintain a fresher water source than that existing at the time of implementation and a stable elevation for migratory and residential birds.	
	Nesting/Roosting Structures	Upon implementation, will continue through Phases I and II	To be implemented as elevation of the Sea decreases and current nesting/roosting locations become land locked. Will provide nesting/roosting islands and/or platforms for migratory and residential birds.	
	Perimeter Pupfish Channel	Upon implementation, will continue through Phases I and II	May be necessary to facilitate breeding based on scientific studies.	
	***Phase II Conditional Actions** (actions developed to respond to new information and changing ecological conditions during Phase II activities):*			
	Halophytes/Soil Stabilization	93 or greater	Dependant upon decrease in water elevation. To be implemented if the Sea's elevation drops considerably and airborne particulates become an issue. Could also provide economic development opportunities.	
	Sediment Traps to Enhance River Water Quality	93 or greater	If the New River Wetlands Demonstration Project proves fruitful, expanded sediment traps/wetlands will be installed along the rivers. Will assist in reducing the nutrient load of the Sea.	
	Permanent Recreational Features	93 or greater	As the water elevation becomes stable, permanent marinas, boat ramps, docks, will be constructed to enhance recreational uses of the Sea.	

Salton Sea Restoration Draft Alternative 2F as of 4/14/99

Alternative	Phase I (Projects with a design life of at least 14 years. Projects which address potential flows of 1.3 MAF to 1.0 MAF per year)		Phase II (Projects with a design life of greater than 100 years. Projects which address potential inflows of 1.3 MAF to 0.8 MAF per year)	
	Project Component(s)	**Performance (years)**	**Project Component(s)**	**Performance (years)/Remark**
2F	Concentration Ponds plus Small EES (6 mi^2)	14 (includes a 3 yr start up period, 4 yr construction period, and a 7 yr life span of the ponds)	Export to San Diego	93 or greater (Phase II construction to begin 6 yrs into Phase I so that Phase II become operational at end of Phase I). Consider placing water treatment plant on San Diego side of mountain range for potential future San Diego use.
			Import from San Diegp w/Water Treatment Plant	
	Phase I Common Actions:			
	Action	**Performance/Duration**	**Remark/Trigger(s)**	
	Flood Flow via existing or new facilities	Continue through Phases I and II or until the need no longer exists	Will only be useful in flood year(s) and if capacity is available in the Sea or transfer canal.	
	Fish Harvesting	Continue through Phases I and II or until the need no longer exists (i.e., other methods of nutrient reduction are in place through river wetlands, etc.)	Provide method for phosphates/nutrients removal from the Sea as well as economic development opportunities.	
	Shoreline Cleanup	Continue through Phases I and II or until the need no longer exists	Cleanup of dead fish and debris around the shores of the Sea. Enhances the aesthetics of the Sea, reduces odor, and provides economic development opportunities.	
	Improving Recreational Features	Continue through Phase I	Improve existing marines and boat launches.	
	***Phase I Conditional Actions** (actions developed to respond to new information and changing ecological conditions during Phase I activities):*			
	Refuge Dike System	Upon implementation, will continue through Phases I and II	To be implemented based on a reduced elevation and/or diminishing water quality of the Sea. Maintain a fresher water source than that existing at the time of implementation and a stable elevation for migratory and residential birds.	
	Nesting/Roosting Structures	Upon implementation, will continue through Phases I and II	To be implemented as elevation of the Sea decreases and current nesting/roosting locations become land locked. Will provide nesting/roosting islands and/or platforms for migratory and residential birds.	
	Perimeter Pupfish Channel	Upon implementation, will continue through Phases I and II	May be necessary to facilitate breeding based on scientific studies.	
	***Phase II Conditional Actions** (actions developed to respond to new information and changing ecological conditions during Phase II activities):*			
	Halophytes/Soil Stabilization	93 or greater	Dependant upon decrease in water elevation. To be implemented if the Sea's elevation drops considerably and airborne particulates become an issue. Could also provide economic development opportunities.	
	Sediment Traps to Enhance River Water Quality	93 or greater	If the New River Wetlands Demonstration Project proves fruitful, expanded sediment traps/wetlands will be installed along the rivers. Will assist in reducing the nutrient load of the Sea.	
	Permanent Recreational Features	93 or greater	As the water elevation becomes stable, permanent marinas, boat ramps, docks, will be constructed to enhance recreational uses of the Sea.	

Salton Sea Restoration Draft Alternative 3A as of 4/14/99

Alternative	Phase I (Projects with a design life of at least 14 years. Projects which address potential flows of 1.3 MAF to 1.0 MAF per year)		Phase II (Projects with a design life of greater than 100 years. Projects which address potential inflows of 1.3 MAF to 0.8 MAF per year)	
	Project Component(s)	**Performance (years)**	**Project Component(s)**	**Performance (years)/Remark**
3A	Enhanced Evaporation System	14 (includes a 3 yr start up period, 4 yr construction period, and a 7 yr life span of the ponds)	Export to Large EES ($15mi^2$)	93 or greater (Phase II construction to begin 6 yrs into Phase I so that Phase II become operational at end of Phase I). Import from Yuma is viewed more as a program alternative. This potential import is years out. The EES containment areas will be treated like landfills and covered with clean soil when capacity is met.
			Import through Yuma	
	Phase I Common Actions:			
	Action	**Performance/Duration**	**Remark/Trigger(s)**	
	Flood Flow via existing or new facilities	Continue through Phases I and II or until the need no longer exists	Will only be useful in flood year(s) and if capacity is available in the Sea or transfer canal.	
	Fish Harvesting	Continue through Phases I and II or until the need no longer exists (i.e., other methods of nutrient reduction are in place through river wetlands, etc.)	Provide method for phosphates/nutrients removal from the Sea as well as economic development opportunities.	
	Shoreline Cleanup	Continue through Phases I and II or until the need no longer exists	Cleanup of dead fish and debris around the shores of the Sea. Enhances the aesthetics of the Sea, reduces odor, and provides economic development opportunities.	
	Improving Recreational Features	Continue through Phase I	Improve existing marines and boat launches.	
	***Phase I Conditional Actions** (actions developed to respond to new information and changing ecological conditions during Phase I activities):*			
	Refuge Dike System	Upon implementation, will continue through Phases I and II	To be implemented based on a reduced elevation and/or diminishing water quality of the Sea. Maintain a fresher water source than that existing at the time of implementation and a stable elevation for migratory and residential birds.	
	Nesting/Roosting Structures	Upon implementation, will continue through Phases I and II	To be implemented as elevation of the Sea decreases and current nesting/roosting locations become land locked. Will provide nesting/roosting islands and/or platforms for migratory and residential birds.	
	Perimeter Pupfish Channel	Upon implementation, will continue through Phases I and II	May be necessary to facilitate breeding based on scientific studies.	
	***Phase II Conditional Actions** (actions developed to respond to new information and changing ecological conditions during Phase II activities):*			
	Halophytes/Soil Stabilization	93 or greater	Dependant upon decrease in water elevation. To be implemented if the Sea's elevation drops considerably and airborne particulates become an issue. Could also provide economic development opportunities.	
	Sediment Traps to Enhance River Water Quality	93 or greater	If the New River Wetlands Demonstration Project proves fruitful, expanded sediment traps/wetlands will be installed along the rivers. Will assist in reducing the nutrient load of the Sea.	
	Permanent Recreational Features	93 or greater	As the water elevation becomes stable, permanent marinas, boat ramps, docks, will be constructed to enhance recreational uses of the Sea.	

Salton Sea Restoration Draft Alternative 3B as of 4/14/99

Alternative	Phase I (Projects with a design life of at least 14 years. Projects which address potential flows of 1.3 MAF to 1.0 MAF per year)		Phase II (Projects with a design life of greater than 100 years. Projects which address potential inflows of 1.3 MAF to 0.8 MAF per year)	
	Project Component(s)	**Performance (years)**	**Project Component(s)**	**Performance (years)/Remark**
3B	Enhanced Evaporation System	14 (includes a 3 yr start up period, 4 yr construction period, and a 7 yr life span of the ponds)	Export to Large EES ($15mi^2$)	93 or greater (Phase II construction to begin 6 yrs into Phase I so that Phase II become operational at end of Phase I). Consider placing water treatment plant on San Diego side of mountain range for potential future San Diego use. The EES containment areas will be treated like landfills and covered with clean soil when capacity is met.
			Import from San Diego w/Water Treatment Plant	
	Phase I Common Actions:			
	Action	**Performance/Duration**	**Remark/Trigger(s)**	
	Flood Flow via existing or new facilities	Continue through Phases I and II or until the need no longer exists	Will only be useful in flood year(s) and if capacity is available in the Sea or transfer canal.	
	Fish Harvesting	Continue through Phases I and II or until the need no longer exists (i.e., other methods of nutrient reduction are in place through river wetlands, etc.)	Provide method for phosphates/nutrients removal from the Sea as well as economic development opportunities.	
	Shoreline Cleanup	Continue through Phases I and II or until the need no longer exists	Cleanup of dead fish and debris around the shores of the Sea. Enhances the aesthetics of the Sea, reduces odor, and provides economic development opportunities.	
	Improving Recreational Features	Continue through Phase I	Improve existing marines and boat launches.	
	***Phase I Conditional Actions** (actions developed to respond to new information and changing ecological conditions during Phase I activities):*			
	Refuge Dike System	Upon implementation, will continue through Phases I and II	To be implemented based on a reduced elevation and/or diminishing water quality of the Sea. Maintain a fresher water source than that existing at the time of implementation and a stable elevation for migratory and residential birds.	
	Nesting/Roosting Structures	Upon implementation, will continue through Phases I and II	To be implemented as elevation of the Sea decreases and current nesting/roosting locations become land locked. Will provide nesting/roosting islands and/or platforms for migratory and residential birds.	
	Perimeter Pupfish Channel	Upon implementation, will continue through Phases I and II	May be necessary to facilitate breeding based on scientific studies.	
	***Phase II Conditional Actions** (actions developed to respond to new information and changing ecological conditions during Phase II activities):*			
	Halophytes/Soil Stabilization	93 or greater	Dependant upon decrease in water elevation. To be implemented if the Sea's elevation drops considerably and airborne particulates become an issue. Could also provide economic development opportunities.	
	Sediment Traps to Enhance River Water Quality	93 or greater	If the New River Wetlands Demonstration Project proves fruitful, expanded sediment traps/wetlands will be installed along the rivers. Will assist in reducing the nutrient load of the Sea.	
	Permanent Recreational Features	93 or greater	As the water elevation becomes stable, permanent marinas, boat ramps, docks, will be constructed to enhance recreational uses of the Sea.	