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ALTERNATIVE 5 OPERATIONAL CRITERIA (uses East and West Bookend as reference)				
Structure	Open/ On	Closed/ Off	Design Flow Rate (SPF), cfs	Notes
<p>Everything in red are new proposed <b>strawman</b> operational criteria (changes to alt3 or alt4 operations). Sensitivity runs are indicated by blue text.            Structure operations in green indicate a <b>team consensus</b> resulting from the interagency CSOP PDT meetings.</p>				
L-29		<p>L-29 constraint = 10.1 feet NGVD</p> <p>*S-333 closed if L-29 &gt; 9.6 feet NGVD            *S-355s closed if L-29 &gt; 9.7 feet NGVD            *S-356 closed if L-29 &gt; 10.1 feet NGVD</p>		<p>S-333 and S-355s deliveries based on WCA-3A regulation schedule and New Rainfall Plan;</p> <p>*Constraints based on 9.7 feet NGVD pavement design criteria and 10.1 feet road over-topping criteria for Tamiami Trail, as discussed with FDOT on 15 August 2005.</p>
Lake Okeechobee	Water Supply Environment (WSE) Schedule			
Regulation Schedule WCA-1	Use regulation schedule for 1996 – Present, at the end of this document.			
Regulation Schedule WCA-2A	Use current WCA-2A regulation schedule (11.0-13.0) (see attachments)			
Regulation Schedule WCA-2B	No Regulation schedule is used for WCA-2B When water in the area exceeds 11.0 ft NGVD, excess water is discharged to the North New River Canal through S-141.			
L-67 Conveyance Features	<p>Hydrologic connection between WCA-3A and WCA-3B: “Hybrid” configuration with passive weir and riser culverts at each structure location along L-67A (alt4a1 sensitivity runs)</p> <p>3 @ 60 ft Weirs (elevations varied at each location)            Crest elevations: 30 feet length at <b>9.5</b> feet NGVD;            20 feet length at <b>9.0</b> feet NGVD;            10 feet length at <b>8.5</b> feet NGVD.</p> <p>3 banks of 6 culverts with flashboard risers            (8 feet wide risers, 48 inch diameter culvert barrels; consistent with 1992 GDM)            Total lineal feet of weir / risers: 324 feet</p> <p>Closure criteria: risers initiate closing when stages at Site 71 reach 7.8 feet NGVD, with complete closure at 8.3 feet NGVD (risers normally set to discharge at ground surface elevation)</p> <p>(sensitivity runs: removal of riser closure criteria; weir elevations raised by 1.0 ft to control 2.0 depth high-water)</p>			<p>Crest elevations are able to be adjusted (to increase or decrease inflows to WCA-3B) to target similar duration of high water conditions (depths &gt; 2.0 and 2.5 feet) in WCA-3B as CERP D13R (adjusted for 36-year period of record) or ALT7R5 (whichever is higher), and not fall below NSM.</p> <p>Structure locations shifted south compared to 1992 MWD GDM (SFWMM rows 27, 26, 25; consistent with alt4a1 sensitivity runs)</p> <p>Recognize need for an adaptive management and monitoring strategy to ensure preservation of WCA-3B resources, while maximizing flow through WCA-3B.</p>

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L-29 Conveyance Features	Hydrologic connection between WCA-3B and NESRS:  S-355A & S-355B as currently constructed, 3 @ 200 feet long weirs with crest at 6.5, 6.3, 6.3 feet NGVD (weirs located in SFWMM column 21, 22, and 26, respectively)			Note: L-29 weir lengths, locations, and crest elevations consistent with alternative 4; western weirs set at ~ground surface elevation; eastern weir ~0.5 feet above grade to control backflow from L-29 canal due to lower topography; marsh velocity and connectivity were considered in setting the weir lengths.
Regulation Schedule WCA-3A	Current C&SF regulation schedule with New Rainfall Plan: <ul style="list-style-type: none"> <li>60% NRDF (New Rainfall-Driven Formula) as SRS demand target, based on sensitivity run evaluation of alt4a2 (closer approximation of passive deliveries);</li> <li>Target distribution of 30% West and 70% East of S-333 along Tamiami Trail (with intent to achieve to the extent practical the NSM target of 35% West and 65% East;</li> <li>If NESRS target demands are unable to be met due to conveyance limitations (passive nature of water deliveries), the undelivered eastern flows will be delivered through the S-12 structures to western SRS to the extent practical;</li> <li>Alternative 5 flows across Transect 18 (Tamiami Trail, east of L-67) should not exceed CERP0 flows (509 kAF average annual) when the CSOP contribution from S-356 discharging to the L-29 canal is subtracted out (noting that S-356 discharges south of the present Transect 18 in the CERP0 configuration).</li> </ul>			Concerns pertaining to S-333 constraint removal and impacts to Lake Okeechobee; Do not want to make drought conditions worse than existing (ALT7R5); potential impacts to CSSS sub-population A and over drainage of NE WCA-3A (IR 118) have been observed in previous alternatives, and will need to be evaluated.  S-355A and S-355B priority over S-333 for NRDF deliveries.  30% of NRDF is representative of the current rainfall formula; NRDF set at 60% noting that alternative 3 flows exceeded CERP flows to SRS (alternative 3 used 70% NSM target) and alternative 4 results indicate potential to increase the NRDF target (alternative 4 used 55% NSM target).  With the notable exceptions of a)removal of Zone E1 and b) removal of seasonal closures of the S-12s, the discharge zones and corresponding rates remain as described in IOP for Protection of the CSSS.

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<b>Regulation Schedule WCA-3B</b>	<p>Closure criteria: initiate closure of culvert riser structures when stages at Site 71 reach 7.8 feet NGVD, with complete closure at 8.3 feet NGVD;</p> <p>S-355s closed if L-29 &gt; 9.7 feet NGVD</p>			The Final Design Memorandum (FDM) indicates that an elevation of 8.5 feet NGVD was the design for WCA-3B. This average was maintained by providing discharge from 3B in excess of the inflow across the L-67 area, not exceeding an inflow of 1500 cfs and outflow of 2000 cfs during SPF routing (Ref. C&SF Project, Modified Water Deliveries to ENP, Part 1 Supplement 55, Agricultural and Conservation Areas, Feature Design Memorandum, September 1993)
<b>Pre-Storm Drawdown</b>	Pre-Storm drawdown operations are not included.			Pre-Storm operations were not included in previous CSOP alternatives.
<b>G-114</b>	HW > 3.6	HW < 3.5	230 (575)	This is an uncontrolled structure. Weir crest elevation 3.5 (Ref. 17)
<b>G-119</b>	FC: HW > 5.3 and the junction of C-4/C-2 < 3.0	Otherwise closed	200 (NA)	Make flood releases when downstream conditions will not be aggravated (Ref. 17)
	WS: S-22 or S-25B < 2.0			Make water supply deliveries during dry period (Ref. 17)

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<b>G-211</b>	<p><u>South Flow Criteria</u></p> <p>Partial Opening: G-211HW &gt; 5.5, and S-176 HW &lt; 4.5, and S-173 HW &lt; 5.4</p> <p>Full Open: WS only</p> <p>Water Supply: L31N / S-176 HW &lt; 4.0 C111 / S-177 HW &lt; 3.0 S18C HW &lt; 2.0</p> <p><u>North Flow Criteria</u> FC: G-211 TW &gt; 6.2</p>	<p><u>South Flow Criteria</u></p> <p>Partial Opening: Closed when G-211 HW &lt; 5.0, or S-173 HW &gt; 5.4, or S-176 HW &gt; 4.5</p> <p>Full open: WS only</p> <p><u>North Flow Criteria</u> FC: G-211 TW &lt; 6.0</p> <p>Closed when G-211 HW &gt; 6.0</p>	<p>Partial Opening: 125 cfs</p> <p>Full open: 1100 (NA)</p> <p>No document gives a maximum flow. 1100 cfs has been recorded</p>	<p>Partial opening allows for limited water supply to S-332B and S-332C to maintain the hydraulic ridge when water available upstream of G-211 (HW &gt; 5.5); downstream operations are limited to gravity flow through S-173 (first pump at S-331 initiates if S-173 HW &gt; 5.5) and are triggered based on dry conditions in the L-31N canal as indicated by an S-176 HW of less than 4.5 feet NGVD. The intent is to increase the water supply to Rocky Glades and Taylor Slough and provide more gradual transitions from wet to dry conditions.</p> <p>Additional capacity at S-356 allows G-211 full open to be used as a water supply only.</p> <p>Note: G-211 HW is located at the north side of the structure; G-211 TW is located at the south side of the structure.</p>
<b>G-93</b>	HW > 2.8	HW < 2.7	640 (1600)	<p>Maintains optimum HW of 2.8 feet (Ref. 17)</p> <p>*model FC triggers differ from trigger levels noted in this table; model FC triggers were developed by SFWMD Office of Modeling analysis of historical data during SFWMM v5.4 calibration</p>
<b>S-118</b>	HW > 4.9	HW < 3.5	860 (1700)	(Ref. 17)

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<b>S-119</b>	Normal: HW > 5.4	Normal: HW < 4.2	400 (900)	(Ref. 17)
	Wet: HW > 4.6	Wet: HW < 4.0		*model FC triggers differ from trigger levels noted in this table; model FC triggers were developed by SFWMD Office of Modeling analysis of historical data during SFWMM v5.4 calibration
<b>S-120</b>	HW > 5.1	HW < 5.0	150 (380)	FC only (Ref. 17)
<b>S-121</b>	WS: S-119 HW < 4.2	FC: S-119 HW > 5.4	100 (100)	No specific criteria developed (criteria based on Ref. 17)
<b>S-122</b>	WS: S-123 HW < 1.6	FC: S-123 HW > 2.4	200 (200)	No specific criteria developed (criteria based on Ref. 17)
<b>S-123</b>	Dry: HW > 3.5	Dry: HW < 2.5	2300 (5000)	(Ref. 17)
	Wet: HW > 2.4	Wet: HW < 1.6		*model FC triggers differ from trigger levels noted in this table; model FC triggers were developed by SFWMD Office of Modeling analysis of historical data during SFWMM v5.4 calibration
		Salinity Control: Close when HW-TW < 0.3 feet		

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S-12A	Current C&SF regulation schedule for WCA-3A with New Rainfall Plan  Target flow distribution: 30% western SRS		8000 (8000)	If NESRS target demands are unable to be met due to conveyance limitations (passive nature of some deliveries), the intention would be to attempt to deliver this excess to Western SRS, rather than to hold in WCA-3A
S-12B				
S-12C				
S-12D				
S-14	never open	always closed	500 (NA)	open when HW > 7.0, but "never functioned as intended due to tailwater conditions which were higher than designed." (Ref. 17)
S-142	FC: Open if the WCA3A 3-station average is above schedule.	S-34 TW > 6.0	500 (NA)	WCA 3A regulation schedule under Modified Rain-driven Plan (Ref. 21)  Maintain an optimum stage at G-54, between elevation 3.5 and 4.5 (Ref. 17)
	G-54 HW < 3.5	G-54 HW > 4.5		
S-148	HW > 5.2	HW < 3.7	1500 (3750)	maintains optimum stage of 5.0 ft in C-1 (Ref. 17)  *model FC triggers differ from trigger levels noted in this table; model FC triggers were developed by SFWMD Office of Modeling analysis of historical data during SFWMM v5.4 calibration

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<b>S-149</b>	HW > 6.2	HW < 4.8	400 (1000)	maintains optimum stage of 5.5 ft in C-1 (Ref. 17)  *model FC triggers differ from trigger levels noted in this table; model FC triggers were developed by SFWMD Office of Modeling analysis of historical data during SFWMM v5.4 calibration
<b>S-151</b>	WCA-3A regulation schedule		1105 (NA)	
<b>S-165</b>	HW > 5.9	HW < 5.1 Salinity Control: HW -TW < 0.2	450 (1125)	maintains optimum upstream stage in C-102 (Ref. 17)  *model FC triggers differ from trigger levels noted in this table; model FC triggers were developed by SFWMD Office of Modeling analysis of historical data during SFWMM v5.4 calibration
<b>S-166</b>	HW > 5.7	HW < 4.9	420 (1050)	maintains optimum upstream stage in C-103N (Ref. 17)  *model FC triggers differ from trigger levels noted in this table; model FC triggers were developed by SFWMD Office of Modeling analysis of historical data during SFWMM v5.4 calibration
<b>S-167</b>	HW > 5.9	HW < 5.1	330 (825)	maintains optimum upstream stage in C-103 (Ref. 17)  *model FC triggers differ from trigger levels noted in this table; model FC triggers were developed by SFWMD Office of Modeling analysis of historical data during SFWMM v5.4 calibration

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<b>S-173</b>	<p>FC: 5.3 (operated in conjunction with S-331)</p> <p>Water Supply: L31N / S-176 HW &lt; 4.0 C111 / S-177 HW &lt; 3.0 S-18C &lt; 2.0</p>	<p>FC: 5.1 (operated in conjunction with S-331)</p> <p>Closed for FC if a positive head differential is not available across the structure</p> <p>No tail water constraint</p>	100 (NA)	<p>Operated in conjunction With S-331 for WS and FC;</p> <p>Intention is to maximize use of S-173 (in conjunction with the lowered FC triggers at S-357) to move FC waters south before the first pump at S-331 is turned on when the S-331 HW reaches 5.5 (refer to S-331 operations in this table).</p> <p>FC triggers were lowered based on PDT evaluation of alternative 4 results (consistent with alt4b1 sensitivity runs)</p>
<b>S-174</b>	closed	closed	500 (850)	(Ref. 20)
<b>S-175</b>	closed	closed	500 (500)	(Ref 20)
<b>S-176</b>	<p>FC: 5.1</p> <p>WS: S-177 HW &lt; 3.0</p>	<p>FC: 4.8</p> <p>WS: S-177 HW &gt; 3.0</p>	630 (1100)	<p>FC on trigger raised from alternative 4 (5.0/4.8) to allow increased opportunity for S-332B, S-332C, and S-332D pump stations to control the upstream reach before triggering releases through S-176; based on the trigger levels for S-332D, S-176 would not pass water south until S-332D is pumping at 500 cfs;</p> <p>Intention is for S-176 to be the last structure to open in reach and to minimize full gate openings, particularly during the dry season based on nesting concerns.</p> <p>Evaluation of the potential benefits of wet season partial gate openings remains ongoing.</p>

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S-177	FC: 4.2  WS: S18C HW < 2.0	FC: 3.6  WS: S18C HW > 2.0	1400 (2900)	<p>FC triggers unchanged from alternative 3 and alternative 4; partial gate opening (alternative 3) has been removed.</p> <p>The 1994 GRR included a pump and flap gate to convey water from the reach of the C-111 Canal between S-176 and S-177 to Taylor Slough thereby mitigating for the seepage from S-332D and reducing discharges to the Southern Glades region. The seepage will be reduced by the proposed seepage mgmt. systems along S-332D. This seepage management system allows the C-111 Canal between S-176 and S-177 to be lowered without meaningfully reducing the flow to Taylor Slough through the S-332D system, providing the flexibility to gradually lower this reach and provide underground storage to attenuate discharges to the Southern Glades.</p> <p>Evaluation of potential benefits from wet season partial gate openings remains ongoing.</p>
S-178	HW > 4.0 SR: HW > 5.0	HW < 3.6 SR: HW < 4.5	510 (1275)	<p>FC open criteria lowered by 0.6 feet from alternative 3 and 4 levels, based on concerns from preliminary potential flood impact screening analysis.</p> <p>Sensitivity run: Alt7r5 trigger criteria</p>

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S-179	High setting: HW > 3.9	High setting: HW < 3.1	1920 (4800)	(Ref. 17)
	Low setting: HW > 3.1	Low setting: HW < 2.7		*model FC triggers differ from trigger levels noted in this table; model FC triggers were developed by SFWMD Office of Modeling analysis of historical data during SFWMM v5.4 calibration
S-18C	FC: 3.2 WS: S-197 HW < 2.0	FC: 2.8	2100 (3200)	FC triggers raised based on evaluation of alt4c1 and alt4c2 sensitivity runs; Intent is to reduce discharges and minimize full gate openings at S-18C, particularly during the dry season.  Evaluation of potential benefits from partial gate openings remains ongoing.
S-194	FC: 5.0	FC: 4.8	100 (NA)	FC triggers set to pass water to east before an opening of S-176 is triggered at 5.1; triggers set to match 500 cfs capacity level at S-332D during the dry season (intention to avoid gate opening at S-176) and set above S-332D triggers during the wet season to allow increased opportunity to avoid gate opening at S-176.  Based on PDT discussions concerning conveyance limitations downstream, structure discharge limited to 100 cfs.

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<b>S-195</b>	FC: HW > 5.9	FC: HW < 5.1	180 (450)	(Ref. 17)
<b>S-196</b>	FC: 5.0	FC: 4.8	100 (500)	<p>FC triggers set to pass water to east before an opening of S-176 is triggered at 5.1; triggers set to match 500 cfs capacity level at S-332D during the dry season (intention to avoid gate opening at S-176) and set above S-332D triggers during the wet season to allow increased opportunity to avoid gate opening at S-176.</p> <p>Based on PDT discussions concerning conveyance limitations downstream, structure discharge limited to 100 cfs.</p>

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<b>S-197</b>	Open if S177 fully open and HW >4.5; and basin continues to increase; and: S-18C HW > 3.2, open 3 total culverts; S-18C HW > 3.5, open 10 total culverts; S-18C HW > 3.8, open 13 total culverts	Closing criteria are reverse of opening criteria: If S-18C HW < 3.8, 10 total culverts remain open; If S-18C HW < 3.5, 3 total culverts remain open	2400 (6000)	Proposed operations raise trigger levels for S-197 opening above levels used today, also recognizing that discharges from S-197 may remain necessary under extreme events;  Unchanged from alternative 3 and alternative 4.  Note: change from 'or' criteria to 'and' criteria at S177HW and S18C HW is unable to be modeled by SFWMM; criteria must be manually evaluated from model output.
<b>S-20</b>	HW > 2.4	HW < 1.8	450 (750)	Wet Period/High Range (Ref. 17)
	HW > 1.4	HW < 1.0		Dry Period/Low Range (Ref. 17)
		(HW - TW) < 0.3 (salinity control)		(Ref. 17) *model FC triggers differ from trigger levels noted in this table; model FC triggers were developed by SFWMD Office of Modeling analysis of historical data during SFWMM v5.4 calibration

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<b>S-20F</b>	HW > 2.2	HW < 1.8	2900 (4900)	High Range (April 30 – October 15) (Ref. 17)
	HW > 1.7	HW < 1.3		Intermediate Range (December 30 – April 30) (Ref. 17)
	HW > 1.4	HW < 1.0		Low Range (October 15 – December 30) (Ref. 17)
		(HW - TW) < 0.3 (salinity control)		(Ref. 17)  *model FC triggers differ from trigger levels noted in this table; model FC triggers were developed by SFWMD Office of Modeling analysis of historical data during SFWMM v5.4 calibration
<b>S-20G</b>	HW > 2.2	HW < 1.8	900 (1700)	High Range (Ref. 17)
	HW > 1.8	HW < 1.4		Intermediate Range (Ref. 17)
	HW > 1.4	HW < 1.0		Low Range (Ref. 17)
		(HW - TW) < 0.2 (salinity control)		(Ref. 17)  *model FC triggers differ from trigger levels noted in this table; model FC triggers were developed by SFWMD Office of Modeling analysis of historical data during SFWMM v5.4 calibration

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<b>S-21</b>	HW > 2.4	HW < 1.5	2560 (4300)	High range (Ref. 17)
	HW > 2.0	HW < 1.0		Low range (Ref. 17)
		(HW - TW) < 0.2 (salinity control)		(Ref. 17) *model FC triggers differ from trigger levels noted in this table; model FC triggers were developed by SFWMD Office of Modeling analysis of historical data during SFWMM v5.4 calibration
<b>S-21A</b>	HW > 2.2	HW < 1.8	1330 (2500)	High Range (Ref. 17)
	HW > 1.8	HW < 1.4		Intermediate Range (Ref. 17)
	HW > 1.4	HW < 1.0		Low Range (Ref. 17)
		(HW - TW) < 0.2		Salinity Control (Ref. 17) *model FC triggers differ from trigger levels noted in this table; model FC triggers were developed by SFWMD Office of Modeling analysis of historical data during SFWMM v5.4 calibration
<b>S-22</b>	HW > 3.5	HW < 2.5	1915 (1915)	Maintain optimum upstream stage of 2.9 feet (Ref. 17)
		(HW - TW) < 0.3		Salinity Control (Ref. 17) *model FC triggers differ from trigger levels noted in this table; model FC triggers were developed by SFWMD Office of Modeling analysis of historical data during SFWMM v5.4 calibration

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<b>ALTERNATIVE 5 OPERATIONAL CRITERIA</b> <i>(uses East and West Bookend as reference)</i>				
<b>Structure</b>	<b>Open/ On</b>	<b>Closed/ Off</b>	<b>Design Flow Rate (SPF), cfs</b>	<b>Notes</b>
<b>S-25</b>	HW > 2.2	HW < 1.8	100*	Maintains C-5 optimum upstream stage of 2.0 feet (Ref. 17) <i>*Design flow is for 1-in-10 year flood.</i>
		(HW- TW) < 0.2		Salinity control (Ref. 17)  <i>*model FC triggers differ from trigger levels noted in this table; model FC triggers were developed by SFWMD Office of Modeling analysis of historical data during SFWMM v5.4 calibration</i>
<b>S-25A</b>	S-25 HW < 1.5	S-25HW > 2.2	30	Salinity control only. Max Q is unknown. The value for this 54" culvert is inferred by comparing to a 96" culvert (S-25). Closing criteria is not specified (Ref. 17)  <i>*model FC triggers differ from trigger levels noted in this table; model FC triggers were developed by SFWMD Office of Modeling analysis of historical data during SFWMM v5.4 calibration</i>
<b>S-25B</b>	HW > 3.0	HW < 2.0	2000 (2000)	Low flow periods (Ref. 17)
	HW > 2.0	HW < 1.0		High flow periods (when stage at junction of C-4 and C-2 > 4.0) (Ref. 17)
		(HW-TW) < 0.3		Salinity Control (Ref. 17)  <i>*model FC triggers differ from trigger levels noted in this table; model FC triggers were developed by SFWMD Office of Modeling analysis of historical data during SFWMM v5.4 calibration</i>

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<b>Structure</b>	<b>Open/ On</b>	<b>Closed/ Off</b>	<b>Design Flow Rate (SPF), cfs</b>	<b>Notes</b>
<b>S-26</b>	HW > 2.8	HW < 2.3	3470 (3470)	Normal Operations (Ref. 17)
	HW > 1.7	HW < 1.2		Flood Operations (when S-31TW > 4.0) (Ref. 17)
		(HW - TW) < 0.3		Salinity Control (Ref. 17) *model FC triggers differ from trigger levels noted in this table; model FC triggers were developed by SFWMD Office of Modeling analysis of historical data during SFWMM v5.4 calibration
<b>S-31</b>	FC: WCA 3A in Zone A HW > 9.0  WS: S-26 HW < 2.5 S-29 HW < 2.0 S-27 HW < 1.5	FC:WCA 3A< Zone A HW < 9.0	700 (NA)	Combined discharge of S-31 and S-337 shall be equal to or less than the discharge from S-151. WS to maintain optimum stage of 2.5 at S-26 and other coastal structures in northern Dade county (Ref. 17)  S-151 releases for C-6 water supply are passed through S-31 (Ref. 15)
<b>S-32</b>	FC: HW > 6.0  WS: S-26 HW < 2.5 S-29 HW < 2.0	FC: HW < 6.0	(NA) 400*	*design discharge not provided (assumed based on maximum observed discharge of 380 cfs) (Ref. 17)

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<b>ALTERNATIVE 5 OPERATIONAL CRITERIA</b> <i>(uses East and West Bookend as reference)</i>				
<b>Structure</b>	<b>Open/ On</b>	<b>Closed/ Off</b>	<b>Design Flow Rate (SPF), cfs</b>	<b>Notes</b>
<b>S-331</b>	<p>FC: 5.5 (1<sup>st</sup> pump) 6.0 (2<sup>nd</sup> pump) 6.5 (3<sup>rd</sup> pump)</p> <p>Water Supply: L31N / S-176 HW &lt; 4.0 C111 / S-177 HW &lt; 3.0 S-18C &lt;2.0</p>	<p>FC: 5.3 (1<sup>st</sup> pump) 5.5 (2<sup>nd</sup> pump) 6.0 (3<sup>rd</sup> pump)</p> <p>Tail water closure criteria: S-176 HW &gt; 4.9 ft.</p>	1160	<p>Intention is to maximize use of S-173 (in conjunction with the lowered FC triggers at S-357) to move FC waters south before the first pump at S-331 is turned; operations for S-173 are 5.3 / 5.1 with no closure criteria;</p> <p>FC triggers were lowered for the first pump, off criteria lowered for second pump, and raised for third pump based on PDT evaluation of alternative 4 results and alt4b sensitivity runs;</p> <p>*From Test 7 EA, designated to not make conditions worse downstream.</p>
<b>S-332</b>	N/A	N/A	465	Structure closed / off (Ref. 20)

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ALTERNATIVE 5 OPERATIONAL CRITERIA (uses East and West Bookend as reference)				
Structure	Open/ On	Closed/ Off	Design Flow Rate (SPF), cfs	Notes
S-332B	<p>EWD = Environmental Water Delivery)**</p> <p>Wet season operations 4.5 / 4.3 (1<sup>st</sup> pump) 4.6 / 4.4 (2<sup>nd</sup> pump) 4.7 / 4.5 (3<sup>rd</sup> pump) 4.8 / 4.6 (4<sup>th</sup> pump)</p> <p>Dry season operations 4.6 / 4.4 (1<sup>st</sup> pump) 4.7 / 4.5 (2<sup>nd</sup> pump) 4.8 / 4.6 (3<sup>rd</sup> pump) 4.9 / 4.7 (4<sup>th</sup> pump)</p> <p>***Mandatory On Level: 5.0 (2 pumps) 5.3 (3 pumps) 5.5 (4 pumps)</p> <p>Marsh ops constraints removed when stages at S-176 HW reach 5.0 (S-332D, S-194, and S-196 are open full) and S-176 gate opening is anticipated at 5.1 (250 cfs at S332B /C); if canal levels continue to rise following full gate opening at S-176 (stages &gt; 5.1), additional capacity to detention areas is utilized (3 or 4 pumps); detention area reservoirs are pumped to a maximum of 3.0 feet, with overflow set only to 3.5 feet if depth exceeds 3.5 feet.</p>	<p>EWD: refer to operations in "open/on" column</p> <p>detention area reservoir depth &gt; 2.5 feet</p> <p>OR</p> <p>marsh ops gradient criteria exceeded</p> <p>***Mandatory On closure criteria:</p> <p>Pump inflows cease when reservoir depth &gt; 3.0 feet under mandatory on operations used to limit discharges through S-176;</p> <p>Pumps can be operated at a reduced pumping rate or intermittent operations to maintain 3.0 depth, in order to control impacts of reservoir seepage on areas to the east (overflow occurs only if depth &gt; 3.5 feet);</p> <p>If S-176 HW &lt; 5.5, maximum 3 pumps on; If S-176 HW &lt; 5.3, maximum 2 pumps on; If S-176 HW &lt; 5.0, return to gradient-limited operations and maximum depth at 2.5 feet</p>	<p>250* (discharges south)</p> <p>(pumps 1 through 4 are each 125 cfs diesel-powered pumps, with discharges split between S-332B and S-332BN)</p>	<p>Marsh ops to maintain hydraulic ridge: Gradient Limits: Month Gradient JAN 0.1 FEB 0.1 MAR 0.1 APR 0.1 MAY 0.1 JUN 0.4 JUL 0.4 AUG 0.4 SEP 0.4 OCT 0.3 NOV 0.2 DEC 0.1 Gradient units:ft per mile</p> <p>**Staggered pump operations for Environmental Water Delivery: facilitates smoother recessions and gradual rises in Rocky Glades; limit pumping when canal stages below 4.5 (alternatives 3 and 4 used EW 4.4/4.2); higher canal levels maintained during dry season based on ENP seepage concerns; pump triggers set higher than S-332D to increase residence time of water moving south when marsh operations restrictions are not in effect.</p> <p>*S-332B pump capacity of 500 cfs is split between northern and southern detention areas; based on PDT discussion, use 3-day average for ENP stage for all marsh ops gradient computations.</p> <p>***Mandatory On Levels supersede marsh operations (SFWMM is only capable of simulating normal EWD operations, mandatory on operations will be evaluated from model output); intention is that S332B and S-332C not be restricted by gradient limit and the 2.5 feet depth limit is increased to 3.0 feet when seepage is exacerbating high water conditions to the east; at a minimum, pumps should be returning seepage volumes passed east from the reservoirs; additional field data is required for final operations.</p>

DRAFT

29 August 2005

DRAFT - 18/30

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ALTERNATIVE 5 OPERATIONAL CRITERIA (uses East and West Bookend as reference)																															
Structure	Open/ On	Closed/ Off	Design Flow Rate (SPF), cfs	Notes																											
S-332BN	<p>EWD:**</p> <p>Wet season operations 4.5 / 4.3 (1<sup>st</sup> pump) 4.6 / 4.4 (2<sup>nd</sup> pump) 4.7 / 4.5 (3<sup>rd</sup> pump) 4.8 / 4.6 (4<sup>th</sup> pump)</p> <p>Dry season operations 4.6 / 4.4 (1<sup>st</sup> pump) 4.7 / 4.5 (2<sup>nd</sup> pump) 4.8 / 4.6 (3<sup>rd</sup> pump) 4.9 / 4.7 (4<sup>th</sup> pump)</p> <p>***Mandatory On Level: 5.0 (2 pumps) 5.3 (3 pumps) 5.5 (4 pumps)</p>	<p>EWD: refer to operations in "open/on" column</p> <p>detention area reservoir depth &gt; 2.5 feet OR marsh ops gradient criteria exceeded</p> <p>***Mandatory On closure criteria: detention area reservoir depth &gt; 3.0 feet  (additional details same as S-332B)</p>	250* (discharges north)	<p>Marsh ops to maintain hydraulic ridge:</p> <p>Gradient Limits:</p> <table border="1"> <thead> <tr> <th>Month</th> <th>Gradient</th> </tr> </thead> <tbody> <tr><td>JAN</td><td>0.1</td></tr> <tr><td>FEB</td><td>0.1</td></tr> <tr><td>MAR</td><td>0.1</td></tr> <tr><td>APR</td><td>0.1</td></tr> <tr><td>MAY</td><td>0.1</td></tr> <tr><td>JUN</td><td>0.4</td></tr> <tr><td>JUL</td><td>0.4</td></tr> <tr><td>AUG</td><td>0.4</td></tr> <tr><td>SEP</td><td>0.4</td></tr> <tr><td>OCT</td><td>0.3</td></tr> <tr><td>NOV</td><td>0.2</td></tr> <tr><td>DEC</td><td>0.1</td></tr> </tbody> </table> <p>Gradient units:ft per mile</p> <p>***Mandatory On Levels supersede marsh operations (refer to S-332B in table for additional details)</p>	Month	Gradient	JAN	0.1	FEB	0.1	MAR	0.1	APR	0.1	MAY	0.1	JUN	0.4	JUL	0.4	AUG	0.4	SEP	0.4	OCT	0.3	NOV	0.2	DEC	0.1	<p>Deleted: ¶</p> <p>Deleted: ¶</p> <p>Deleted: ¶</p>
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ALTERNATIVE 5 OPERATIONAL CRITERIA (uses East and West Bookend as reference)																														
Structure	Open/ On	Closed/ Off	Design Flow Rate (SPF), cfs	Notes																										
S-332C	<p>EWD:**</p> <p>Wet season operations 4.5 / 4.3 (1<sup>st</sup> pump) 4.6 / 4.4 (2<sup>nd</sup> pump) 4.7 / 4.5 (3<sup>rd</sup> pump) 4.8 / 4.6 (4<sup>th</sup> pump)</p> <p>Dry season operations 4.6 / 4.4 (1<sup>st</sup> pump) 4.7 / 4.5 (2<sup>nd</sup> pump) 4.8 / 4.6 (3<sup>rd</sup> pump) 4.9 / 4.7 (4<sup>th</sup> pump)</p>	<p>EWD: refer to operations in "open/on" column</p> <p>detention area reservoir depth &gt; 2.5 feet</p> <p>OR</p> <p>marsh ops gradient criteria exceeded</p>	500	<p>Marsh ops to maintain hydraulic ridge:</p> <p>Gradient Limits:</p> <table border="1"> <thead> <tr> <th>Month</th> <th>Gradient</th> </tr> </thead> <tbody> <tr><td>JAN</td><td>0.1</td></tr> <tr><td>FEB</td><td>0.1</td></tr> <tr><td>MAR</td><td>0.1</td></tr> <tr><td>APR</td><td>0.1</td></tr> <tr><td>MAY</td><td>0.1</td></tr> <tr><td>JUN</td><td>0.4</td></tr> <tr><td>JUL</td><td>0.4</td></tr> <tr><td>AUG</td><td>0.4</td></tr> <tr><td>SEP</td><td>0.4</td></tr> <tr><td>OCT</td><td>0.3</td></tr> <tr><td>NOV</td><td>0.2</td></tr> <tr><td>DEC</td><td>0.1</td></tr> </tbody> </table>	Month	Gradient	JAN	0.1	FEB	0.1	MAR	0.1	APR	0.1	MAY	0.1	JUN	0.4	JUL	0.4	AUG	0.4	SEP	0.4	OCT	0.3	NOV	0.2	DEC	0.1
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	<p>***Mandatory On Level:</p> <p>5.0 (2 pumps) 5.3 (3 pumps) 5.5 (4 pumps)</p>	<p>***Mandatory On closure criteria:</p> <p>detention area reservoir depth &gt; 3.0 feet</p> <p>(additional details same as S-332B)</p>		<p>Gradient units:ft per mile</p> <p>***Mandatory On Levels supersede marsh operations (refer to S-332B in table for additional details)</p>																										

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ALTERNATIVE 5 OPERATIONAL CRITERIA (uses East and West Bookend as reference)				
Structure	Open/ On	Closed/ Off	Design Flow Rate (SPF), cfs	Notes
S-332D	<p>EWD:</p> <p>Wet season operations 4.6 / 4.4 (1<sup>st</sup> pump) 4.7 / 4.5 (2<sup>nd</sup> pump) 4.8 / 4.6 (3<sup>rd</sup> pump) 4.9 / 4.7 (4<sup>th</sup> pump)</p> <p>Dry season operations 4.5/4.3 (75 cfs electric) <del>4.7 / 4.5 (1<sup>st</sup> pump)</del> 4.8 / 4.6 (2<sup>nd</sup> pump) 4.9 / 4.7 (3<sup>rd</sup> pump) 5.0 / 4.8 (4<sup>th</sup> pump)</p>	EW: refer to operations in "open/on" column	500  (Pumps one through four are each 125 cfs diesel powered pumps)	<p>No CSSS constraints.</p> <p>S-176 would not pass water south until S-332D is pumping at 500 cfs; separation of 0.2 feet from 500 cfs operations to S-176 gate opening during wet season, 0.1 feet during dry season; intention is to increase discharge to Taylor Slough and reduce discharges to C-111.</p> <p>Limited pump operations when canal stages below 4.5; higher canal levels are maintained during dry season based on ENP seepage concerns; pump triggers set lower than S-332B and S-332C to increase residence time of water moving south when marsh operations restrictions are not in effect.</p>

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ALTERNATIVE 5 OPERATIONAL CRITERIA (uses East and West Bookend as reference)				
Structure	Open/ On	Closed/ Off	Design Flow Rate (SPF), cfs	Notes
<b>S-332D Seepage Management Pumps</b>	Wet season operations S-176 HW: *4.9 (200 cfs) 4.8 (150 cfs) 4.7 (100 cfs)	Wet season: S-176 HW: *4.7 (200 cfs) 4.6 (150 cfs) 4.5 (100 cfs)	200	Operations consistent with alternative 3 (functional replacement for C-111 connector canal), with four 50 cfs pumps to convey water from the C-111 canal to the buffer area through an approximately 500 feet wide above-ground flow way.
	Dry season operations S-176 HW: *5.0 (200 cfs) 4.9(150 cfs) 4.8 (100 cfs)	Dry season: S-176 HW: *4.8 (200 cfs) 4.7 (150 cfs) 4.6 (100 cfs)		The approximately 400-acres of buffer cell is located along the eastern edge of the S-332D detention area and flow way; the buffer cell is approximately 500 feet wide along Cell 1 and 2 and 1000 feet wide along the flow way
	First pump (wet,dry): S-177 HW: 3.4 (50 cfs)	First pump (wet,dry): S-177 HW: 3.2 (50 cfs)		*Pump trigger levels are in response to S-332D with trigger location at S-332D for pumps 2, 3, and 4. Pump #1 is operated based on S-177 HW, just above the canal WS level (operations approach unchanged from alternative 3 and alternative 4, but triggers adjusted to match changes to S-332D triggers)

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ALTERNATIVE 5 OPERATIONAL CRITERIA (uses East and West Bookend as reference)				
Structure	Open/ On	Closed/ Off	Design Flow Rate (SPF), cfs	Notes
North Portion of S-332B and S-332C detention area (NPDA)	<p>NPDA receives water from S-357 and S-332B (fraction discharging north, S-332BN in model):</p> <ul style="list-style-type: none"> <li>Includes the area from the south side of the 8.5 SMA STA down to and including the S-332B North cell</li> <li>North-South distance along ENP boundary of approximately 3 miles</li> <li>NPDA receives 50% of the 500 cfs capacity from S-332B (250 cfs)</li> <li>Concrete curb elevation of 8.5 feet NGVD (1.5 feet above average ground surface, AGS), as detailed for the east bookend run (SFWMM resolution unable to represent this feature)</li> <li>8 culverts with top of boards set at 3.5 feet above AGS (S-332B discharges stop at detention area depth of 2.5 feet above AGS) – raised 0.5 feet from alternative 3; pump inflows cease when reservoir depth &gt; 2.5 feet under normal operations, 3.0 feet under “mandatory on” operations used to limit discharges through S-176</li> </ul>			
	<p>Interconnect between the northern portion and southern portion of the S-332B and S-332C detention area (assumptions unchanged from east and west bookend runs):</p> <ul style="list-style-type: none"> <li>A broad-crested weir should be assumed between the northern and southern portions of the S-332B and S-332C detention area to represent the design proposed by USACE and supported by SFWMD which allows a portion or all of the flow from S-332B to be routed either north or south and allow equalization when the pump is discharging or idle. The crest of this weir should be set at 18 inches above ground.</li> <li>In this run the weir will withdraw water from the approximately 500 feet wide flow way area created by the proposed concrete weir in the NPDA and discharge it into the approximately 500 feet wide flow way area created by the proposed concrete weir in the Southern portion of the S-332B and S-332C detention area (SPDA)</li> <li>An overflow depth of 18 inches (1.5 feet) to allow complete inundation of the detention area and keep velocity relatively low for the approximately 2,500 feet wide detention area (3,000 feet minus 500 feet wide flow way width). For a depth of 1 foot the width of 2,500 provides 2,500 square feet of cross-sectional area flow. Using a maximum velocity of 0.1 feet per second (3 cm per second) results in a maximum flow rate of 250 cfs. This is reasonable when compared to the maximum pumping rate of 500 cfs per pump station.</li> <li>Assumed weir length is 250 feet.</li> </ul>			
South Portion of S-332B and S-332C detention area (SPDA)	<p>SPDA receives water from S-332B (fraction discharging south, S-332B in model) and S-332C:</p> <ul style="list-style-type: none"> <li>Includes the area from and including the S-332B West cell down to the North side of the high head cell of S-332D</li> <li>North-South distance along ENP boundary of approximately 4.5 miles</li> <li>SPDA receives 50% of the 500 cfs capacity from S-332B (250 cfs)</li> <li>SPDA receives all of the discharges from S-332C</li> <li>Concrete curb elevation of 8.0 feet NGVD (1.5 feet above AGS), as detailed for the east bookend run (SFWMM resolution unable to represent this feature)</li> <li>16 culverts with top of boards set at 3.5 feet above AGS (S-332B discharges stop at detention area depth of 2.5 feet above AGS) – raised 0.5 feet from alternative 3; pump inflows cease when reservoir depth &gt; 2.5 feet under normal operations, 3.0 feet under “mandatory on” operations used to limit discharges through S-176</li> </ul>			

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ALTERNATIVE 5 OPERATIONAL CRITERIA (uses East and West Bookend as reference)				
Structure	Open/ On	Closed/ Off	Design Flow Rate (SPF), cfs	Notes
<b>C-111 Detention Areas</b>	<p>Culvert riser boards set to initiate discharge only if 3.5 feet depth is achieved in the detention areas; emergency overflow spillways (design requirement) initiate discharge is depth exceeds 4.0 feet.</p> <p>Discharges into the C-111 detention area from the S-332B and S-332C pumps are operated subject to marsh operations (refer to S-332B and S-332C structures in this table) with discharges stopped if detention area depth &gt; 2.5 feet under normal operations, 3.0 feet under "mandatory on" operations used to limit discharges through S-176</p> <p>Intention is that pumping into detention areas will not initiate overflow; overflow would be triggered only by a significant rainfall event occurring on a full reservoir.</p>			<p>Normal operations will be targeted to achieve marsh restoration. However, this provision does not include a requirement to maintain water levels in the reservoirs during dry conditions by bringing water in from outside the drainage basin (Ref. 20).</p> <p>Detention area features as specified in the east bookend, west bookend, alternative 3, and alternative 4, unless noted under NPDA and SPDA in this table.</p>
<b>S-332E</b>	<p>Removed from CSOP project scope.</p> <p>C-111 spreader canal and partial backfill of C-110 canal have been shifted to the C-111 spreader project and removed from CSOP alternative modeling, starting with alternative 5).</p>		50	<p>The S-332E pump station is assumed not in place for alternative 5; authority for design and construction has been moved to C-111 spreader project.</p> <p>Note: SFWMM sensitivity run will be needed with pump removed for permit submittal if this component is deferred to ACCELER8 or CERP.</p> <p>This pump station will be expedited in CERP C-111 Spreader Project. P&amp;S is planned to begin in 2008. Planned construction completion in 2009.</p>
<b>S-333</b>	<p>Current C&amp;SF WCA-3A regulation schedule with New Rainfall Plan.</p> <p>Target flow distribution: 70% eastern SRS</p>	L-29 stage > 9.6 feet NGVD	1000 (NA)	<p>S-355A and S-355B priority over S-333 for NRDF deliveries</p> <p>Capacity is limited to 1000 cfs to allow increased opportunity for flows through WCA-3B, given removal of 8.5 feet L-29 constraint used in alternatives 3 and 4.</p>

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<b>ALTERNATIVE 5 OPERATIONAL CRITERIA</b> <i>(uses East and West Bookend as reference)</i>				
<b>Structure</b>	<b>Open/ On</b>	<b>Closed/ Off</b>	<b>Design Flow Rate (SPF), cfs</b>	<b>Notes</b>
<b>S-334</b>	WS only	WS only	1230 (NA)	
<b>S-335</b>	<p>Partial gate open: FC: 7.2</p> <p>Full gate open: FC: 7.4</p> <p>WS: C-2 canal stage &lt; 2.5 S-331 HW &lt; 4.0 ft S-331 TW &lt; 3.5 ft S-177 HW &lt; 2.5 ft S-18c HW &lt; 2.0ft S-21 HW &lt; 1.9 ft S-25b HW &lt; 2.0 S-22 HW &lt; 2.0</p>	<p>Partial gate open: FC: 7.0 S-335 TW &gt; 6.3</p> <p>Full gate open: FC: 7.2 S-335 TW &gt; 6.0</p>	<p>Partial open: 250 cfs</p> <p>Full open: 525 (NA)</p>	<p>Intention is to provide drainage benefit to eastern WCA-3B under high stages, while reducing over drainage of Pennsuco wetlands; triggers have been raised from alternative 4 (7.0 / 6.6) given the increase in available capacity at S-356 (increased from 500 to 950 cfs); full gate openings are further limited (to prevent over drainage of and reduced benefits to Pennsuco) by partial openings of S-335 at onset of high water levels in canal.</p>
<b>S-336</b>	WS Only	<p>WS Only</p> <p>Closed if S-356 On</p>	145 (NA)	Used for supplemental water deliveries to East Dade County (Ref. 17)
<b>S-337</b>	WS only	WS only	605 (NA)	Supplies water to the Northwest Wellfield, the ENP-South Dade County conveyance system and to C-2 area (Ref. 15 and Ref. 17)

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<b>ALTERNATIVE 5 OPERATIONAL CRITERIA</b> <i>(uses East and West Bookend as reference)</i>				
<b>Structure</b>	<b>Open/ On</b>	<b>Closed/ Off</b>	<b>Design Flow Rate (SPF), cfs</b>	<b>Notes</b>
<b>S-338</b>	FC: HW > 5.5	FC: HW > 5.0  Closed if head difference across structure < 0.2 feet  OR  S-21 HW > 1.9  OR  S-148 HW > 4.5	50 (425)	FC criteria lowered to deliver additional water to Biscayne Bay; capacity limited to 50 cfs (alternatives 3 and 4 assumed 100 cfs), with additional closure criteria at S-21 and S-148 based on potential flooding concerns related to downstream conveyance limitations. The reduced capacity and closure criteria provide Environmental Water Deliveries to Biscayne Bay. Closure criteria set to match midpoint of high and low operational open criteria in the SFWMD structure manuals.  If S-356 pump is on, it is understood that S-338 will be closed or open only to pass water to the east.
<b>S-339</b>			1100 (NA)	Operations unchanged through CSOP planning conditions and alternatives (Ref. 15)
<b>S-340</b>			1100 (NA)	
<b>S343A</b>	WCA 3A Regulation Schedule	Closed for CSSS nesting season considerations as under IOP (Nov. 1 – July 15)	195 (NA)	(Ref. 21, Ref. 15)
<b>S343B</b>	WCA 3A Regulation Schedule	Closed for CSSS nesting season considerations as under IOP (Nov. 1 – July 15)	195 (NA)	(Ref. 21, Ref 15)

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<b>ALTERNATIVE 5 OPERATIONAL CRITERIA</b> <i>(uses East and West Bookend as reference)</i>				
<b>Structure</b>	<b>Open/ On</b>	<b>Closed/ Off</b>	<b>Design Flow Rate (SPF), cfs</b>	<b>Notes</b>
<b>S-344</b>	WCA 3A Regulation Schedule	Closed for CSSS nesting season considerations as under IOP (Nov. 1 – July 15)	135 (NA)	(Ref. 21, Ref 15)
<b>S-346</b>	Removed			
<b>S-347</b>	Removed			
<b>S-349A</b>	3 short (in canal flow direction) plugs located downstream on each of the 3 L-67 "hybrid" structures; plugs to be set at approximately 0.25 feet below ground surface elevation; each plug will include a 20-foot wide boat channel for navigation (bottom elevation 4.0 feet NGVD); Intent is to cause more flow to move from across present L-67 levee locations from WCA-3A to WCA-3B. The 3 plugs and boat channels are co-located in the same cells as the L-67 "hybrid" structures.			
<b>S-349B</b>				
<b>S-349C</b>				

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ALTERNATIVE 5 OPERATIONAL CRITERIA (uses East and West Bookend as reference)				
Structure	Open/ On	Closed/ Off	Design Flow Rate (SPF), cfs	Notes
S-355A		When there is no head difference or a reverse flow across the structure,	1000* (NA)	S-355A and S-355B priority over S-333 for NRDF deliveries;
	Current C&SF WCA-3A regulation schedule with New Rainfall Plan	OR		Structure would close only if deliveries exceed NRDF target, reverse head present across structure, L-29 canal approaching design high water level of 10.1 feet, or to prevent over-drainage of WCA-3B;
	Target flow distribution: 70% eastern SRS	L-29 stage exceeds 9.7 feet NGVD		MWD authorized collector canal. Therefore, propose a collector canal (size not determined) to efficiently distribute water from 3B into NESRS.
S-355B		OR		
		Stage at S-355 HW less than 7.2 feet NGVD (~1.0 ft above ground elevation for HW grid cell of 6.23)	1000* (NA)	Closure criteria raised to 1.0 feet above ground elevation to control low water conditions observed under alternative 3 operations; alternative 4 assumed ½ foot for closure; intention is to prevent over drainage of WCA-3B, given that the 2 western weirs are set at ~ground surface elevation.

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ALTERNATIVE 5 OPERATIONAL CRITERIA (uses East and West Bookend as reference)				
Structure	Open/ On	Closed/ Off	Design Flow Rate (SPF), cfs	Notes
S-356	<p>Gradient based seepage calculation</p> <p>OR</p> <p>Mandatory on for FC: 6.1</p> <p><i>*Additional Capacity:</i></p> <p>FC: 6.2 (200 cfs total)</p> <p>FC: 6.4 (450 cfs total)</p>	<p>Will shut off when:</p> <ol style="list-style-type: none"> <li>1) L29 stage &gt; 10.1</li> <li>2) Regional water delivery through S151 → S337 → S335 or S334</li> <li>3) L-31N &lt; 5.5</li> </ol> <p>Mandatory on for FC, closure criteria: 6.0</p> <p><i>*Additional Capacity:</i></p> <p>FC: 6.0 (200 cfs total)</p> <p>FC: 6.2 (450 cfs total)</p>	<p>500 (NA)</p> <p><i>*450 cfs (additional capacity)</i></p> <p>950 cfs total (discharge into L-29 canal)</p>	<p>Gradient based seepage calculation consistent with West bookend: Q = 500 * (G3578 – G3552)</p> <p>The need for additional field data to develop a more accurate seepage equation for real-time operations is recognized; a modified equation may include a reduction in pumping rate with lower canal stages to make a better transition from wet to dry conditions; equation above is an approximation / "rough" guess for modeling purposes.</p> <p>Based on PDT discussion, it is the understanding that S-356 will have a safety net for flood control (unchanged from alternative 4); gradient-based seepage operations will remain in effect unless the stage in L-31N (measured at G-211 HW) reaches the flood trigger or if one of the close criteria is triggered;</p> <p>Minimum canal stage for gradient-based seepage equation has been raised to 5.5 feet NGVD (4.5 in alternative 4) to address ENP concerns of increased seepage loss from NESRS at lower canal stages.</p> <p>The SFWMM is currently unable to simulate the dual operations at S-356; gradient-based seepage operations only would be modeled by SFWMM for alternative 5 for the 500 cfs pump.</p> <p><i>*QRB direction on 11 August 2005 to include increased capacity at S-356; assume structure will discharge to L-29 canal.</i></p>

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<b>ALTERNATIVE 5 OPERATIONAL CRITERIA</b> <i>(uses East and West Bookend as reference)</i>				
<b>Structure</b>	<b>Open/ On</b>	<b>Closed/ Off</b>	<b>Design Flow Rate (SPF), cfs</b>	<b>Notes</b>
<b>S-357</b>	<p>500 cfs to 8.5 SMA STA and detention areas (4 pumps)</p> <p>Wet Season: 1<sup>st</sup> / 2<sup>nd</sup> pump on 5.2 3<sup>rd</sup> / 4<sup>th</sup> pump on 5.5</p> <p>Dry Season: 1<sup>st</sup> / 2<sup>nd</sup> pump on 5.7 3<sup>rd</sup> / 4<sup>th</sup> pump on 6.0</p> <p>500 cfs total capacity with 2.5 ft overflow for 8.5 SMA STA</p>	<p>Wet Season: 1<sup>st</sup> / 2<sup>nd</sup> pump off 4.9 3<sup>rd</sup> / 4<sup>th</sup> pump off 5.2</p> <p>Dry Season: 1<sup>st</sup> / 2<sup>nd</sup> pump off 5.4 3<sup>rd</sup> / 4<sup>th</sup> pump off 5.7</p>	500 (NA)	<p>Implementation of the Recommended Plan shall not adversely harm the restoration levels of ENP's hydrology greater than that simulated through modeling of Alt 6D (Reference 22).</p> <p>500 cfs total capacity with 2.5 ft overflow for 8.5 SMA STA (previous alternatives assumed 3.5 feet, based on design prior to completion of detention area levee tie-in north to 8.5 SMA.</p> <p>Pump triggers are lowered based on sensitivity run recommendations (alt4b3); additional proposed changes at S-331 and STA overflow to address potential flood impacts.</p>
<i>"WS" indicates a Water Supply Rule; "FC" indicates a Flood Control Rule.</i>				