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APPENDIX E

**ENVIRONMENTAL FEATURES MAPS
COMPILED FROM SELECTED DR/GR DOCUMENTS**

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APPENDIX E

Environmental Features Maps Compiled from Selected DR/GR Documents

(NOTE: While all maps listed below contain information specific to Lee County DR/GR lands, highlighted maps are considered to be of higher priority in the event that a phased approach is taken to incorporating DR/GR-related maps into the Lee County Geographic Information System.)

Lee County, Florida - DR/GR Maps and Overlays					
No	Page	Fig. No	Title/Caption	Key Environmental Resources/Features	Comment
1. Lee County Comprehensive Plan Update					
					No maps to include
2. Groundwater Resources and Mining Study					
2-1	4	III-1	Lee Future Land Use Map	Shows the future land use in the DR/GR.	This figure may have been acquired from Lee County
2-2	19	V-4	Lee County Watersheds	Shows the different watersheds within the county.	This figure may have been acquired from Lee County
2-3			Viewlog database	For this report and the “Engineering Analysis for Properties Designated within the City of Bonita Springs as ‘Density Reduction/Groundwater Resource’ (DR/GR)” report a Viewlog database was utilized to create many of the figures in the report. Including past water level contours, and hydrostratigraphy. It would be advantageous for the County to acquire a copy of this database. It could be updated	

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				and could be used to recreate any of the figures from these reports.	
2-4		VI-3	Location map of wells with lithologic data		
2-5		VI-4	Digital elevation model interpolated to 500ft grid		
2-6		VI-5	Contour map of Holocene thickness		
2-7		VI-6	Contour map of Pliocene thickness		
2-8		VI-9	Contour map of Ochopee thickness		
2-9		VI-11	Contour map of Peace River sandstone thickness		
2-10		VI-13	Contour map of Arcadia thickness		
2-11		VI-36	Location map of wells with water level data		
2-12	38	VII-19	Extent and location (domain) of Model Grid for Lee County		Depicts extent of model area in relation to DR/GR land features.
2-13		VII-24	Location of existing borrow pits		
2-14		VII-37	Net recharge to water table average annual season steady state		
3. Lee Master Mitigation Plan (LMMP)					
					No maps to include

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4. Water Resources Management Project				
4-1				<p>Maps showing aquifer storage (the importance here is that the DR/GR contains significant amounts of groundwater storage for the county): Figures 4-5, 4-7, 4-9, 4-11, 4-13, 4-15, 4-17, 4-19, 4-21.</p> <p>Maps showing groundwater flow (the importance here is the possible maintenance of fresh water flows to the estuaries): Figures 4-50 - 4-51.</p> <p>Plate 11: shows thick portions of Water Table Aquifer are within the DR/GR.</p> <p>Plate 15: shows thick portions of Tamiami Aquifer are within the DR/GR.</p> <p>Plate 19: shows thick portions of Sandstone Aquifer are within the DR/GR.</p> <p>Plate 23: shows thick portions of Mid-Hawthorn Aquifer are within the DR/GR.</p> <p>Plates 79, 80, 81: Recharge areas for the Water Table, Lower Tamiami, and Sandstone Aquifers (recharge occurs within the DR/GR).</p> <p>Plate 82: Recharge areas for Mid-Hawthorn aquifer</p> <p>Plates 83, 84, 85: Potential wellfields (some of these areas may already be developed as wellfields).</p>

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5. Engineering Analysis for Properties Designated within the City of Bonita Springs as “Density Reduction/Groundwater Resource” (DR/GR)					
					No maps to include
6. Estero Bay: State of the Bay Report					
6-1			Estero Bay Watershed Land Conservation/Preservation Strategy Map	Conservation Lands, Proposed Acquisition Lands	The 2000 document includes the entire DR/GR area. Relatively comprehensive, the map was adopted in 1998 – not current.
6-2	8		Estero Verified 2002 303d	Water Quality, Impaired Areas, Federal 303d classification These should be kept updated and could be overlaid with potential restoration, protection and enhancement areas to identify parameters that might compromise project success or provide opportunities for further enhancement.	The 2004 document includes SFWMD sub-basin boundaries from Charlotte Harbor NEP, Southwest Florida Regional Planning Council, Florida Department of Environmental Protection, SFWMD. Based on 2001 data

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7. Lower Charlotte Harbor Reconnaissance Report					
7-1	42	Fig. 19	Drainage Characteristics of Soils		For all maps within this document: Includes only Estero Bay Basin, not Trafford or West Caloosahatchee portions of DR/GR.
7-2	55	Fig. 26	Lands in Conservation	Conservation Lands Under Public Ownership	Probably most up-to-date and comprehensive map in list of literature reviewed.
7-3	56	Fig. 27	Conservation Easements		Important in terms of linking protected land parcels.
7-4	58	Fig. 29	Florida Greenways and Trails Program Conservation/Ecological Opportunities	Greenways	
7-5	58	Fig. 30	Identified Lands for Potential Future Acquisition	Proposed Acquisition Lands	
7-6	68	Fig. 34	FDEP Integrated Assessment	Impaired Areas	From FDEP
7-7	69	Fig. 35	Designated Uses	State Water Classifications	From FDEP
7-8	73	Fig. 39	Estero Verified Impairments	Impaired Areas	From FDEP
7-9	81	Fig. 43	Dissolved Oxygen and Bio-Chemical Oxygen Demand Trends	Water Quality	From TetraTech/Janicki June 2004 report
7-10	81	Fig. 44	Turbidity and Total Suspended Solids Trends	Water Quality	From TetraTech/Janicki June 2004 report

DRAFT

7-11	82	Fig. 45	Nutrient Trends	Water Quality	From TetraTech/Janicki June 2004 report
7-12	84	Fig. 46	Known Outfalls (NDPES permits)	Water Quality	From Lee County, Charlotte Harbor NEP, and U.S. Census Bureau
7-13	86	Fig. 48	Wastewater Generating Facilities NPDES Status	Water Quality	From FDEP, Charlotte Harbor NEP, and U.S. Census Bureau
7-14	86	Fig. 49	Domestic Wastewater Generating Facilities	Water Quality	From FDEP, Charlotte Harbor NEP, and U.S. Census Bureau
7-15	88	Fig. 50	Petroleum Storage Tanks	Water Quality	From FDEP, Charlotte Harbor NEP, and U.S. Census Bureau
7-16	89	Fig. 51	Hazardous Waste Handlers	Water Quality	From FDEP, Charlotte Harbor NEP, and U.S. Census Bureau
7-17	90	Fig. 52	Identified Stormwater Plans	Water Quality	From Lee County, Charlotte Harbor NEP, and U.S. Census Bureau

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8. Water Quality Data Analysis and Report					
8-1		Fig 6-11	CHNEP Basins – Southern Coast – Surface – Specific Conductivity	Water Quality (Trend)	For all Maps in Section 8 – shows trends in water quality parameter. Includes only Estero Bay Basin of DR/GR, some of eastern parts not included. Note - data are sparse within the southern DR/GR.
8-2		Fig 6-12	CHNEP Basins – Southern Coast – Bottom – Specific Conductivity	Water Quality (Trend)	
8-3		Fig 6-14	CHNEP Basins – Southern Coast – Surface – Dissolved Oxygen	Water Quality (Trend)	
8-4		Fig 6-15	CHNEP Basins – Southern Coast – Bottom – Dissolved Oxygen	Water Quality (Trend)	
8-5		Fig 6-16	CHNEP Basins – Southern Coast – Surface – Biological Oxygen Demand	Water Quality (Trend)	
8-6		Fig 6-17	CHNEP Basins – Southern Coast – Bottom – Biological Oxygen Demand	Water Quality (Trend)	
8-7		Fig 6-20	CHNEP Basins – Southern Coast – Surface – Temperature	Water Quality (Trend)	
8-8		Fig 6-21	CHNEP Basins – Southern Coast – Surface – Temperature	Water Quality (Trend)	
8-9		Fig 6-23	CHNEP Basins – Southern Coast – Surface – Turbidity	Water Quality (Trend)	
8-10		Fig 6-24	CHNEP Basins – Southern Coast –	Water Quality (Trend)	

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			Surface – Turbidity		
8-11	Fig 6-32	CHNEP Basins – Southern Coast – Surface – Chlorophyll-a (corrected)	Water Quality (Trend)		
8-12	Fig 6-35	CHNEP Basins – Southern Coast – Surface – Nitrate + Nitrite	Water Quality (Trend)		
8-13	Fig 6-36	CHNEP Basins – Southern Coast – Bottom – Nitrate + Nitrite	Water Quality (Trend)		
8-14	Fig 6-39	CHNEP Basins – Southern Coast – Surface – Total Kjeldahl Nitrogen	Water Quality (Trend)		
8-15	Fig 6-40	CHNEP Basins – Southern Coast – Bottom – Total Kjeldahl Nitrogen	Water Quality (Trend)		
8-16	Fig 6-41	CHNEP Basins – Southern Coast – Surface – Total Nitrogen	Water Quality (Trend)		
8-17	Fig 6-42	CHNEP Basins – Southern Coast – Bottom – Total Nitrogen	Water Quality (Trend)		
8-18	Fig 6-45	CHNEP Basins – Southern Coast – Surface – Ammonia	Water Quality (Trend)		
8-19	Fig 6-46	CHNEP Basins – Southern Coast – Bottom – Ammonia	Water Quality (Trend)		
8-20	Fig 6-49	CHNEP Basins – Southern Coast – Surface – Total Phosphate	Water Quality (Trend)		
8-21	Fig 6-50	CHNEP Basins – Southern Coast – Bottom – Total Phosphate	Water Quality (Trend)		
8-22	Fig 6-51	CHNEP Basins – Southern Coast – Surface – Orthophosphate	Water Quality (Trend)		
8-23	Fig 6-52	CHNEP Basins – Southern Coast – Bottom – Orthophosphate	Water Quality (Trend)		
8-24	Fig 6-55	CHNEP Basins – Southern Coast – Surface – Sulfate	Water Quality (Trend)		
8-25	Fig 6-58	CHNEP Basins – Southern Coast –	Water Quality (Trend)		

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			Surface – Chloride		
8-26		Fig 6-62	CHNEP Basins – Southern Coast – Surface – Fecal Coliform	Water Quality (Trend)	

9. How much is enough? Landscape-scale conservation for the Florida panther

9-1	120	Fig. 1	Study area and land cover (WMD aerial photography).	Vegetation Communities, Wetlands, Rare and Unique Uplands, Native Uplands, Native Vegetation Communities	
9-2	121	Fig. 2	Florida panther radio-telemetry data (Feb1981-March 2001)	Listed Species	
9-3	124	Fig. 3	Least-cost paths most likely to be taken by Florida panthers dispersing out of south Florida. Based on analysis of impediments to Florida panther dispersal such as roadways.	Listed Species	
9-4	127	Fig. 4	A model of landscape components significant to Florida panther conservation based on findings from Euclidean distance analyses	Listed Species	
9-5	128	Fig. 5	Locations of Primary, Dispersal, and Secondary zones	Habitat for Listed Species	Integrates information from Fig. 4 into a connected landscape mosaic of cover types needed to support the Florida panther population. Contact Paul Souza or Allen Webb, USFWS,

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					Vero Beach, 772-562-3909 for current habitat map.
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10. Closing the Gaps in Florida's Wildlife Habitat Conservation System (Gaps Report)					
10-1	53	Fig. 48	Potential black bear habitat in and around the Big Cypress National Preserve		
10-2	68	Fig. 65	Proposed strategic habitat conservation areas for the Florida panther		
10-3	123	Fig. 141	Overlay of coarse habitat distribution maps for 120 rare species		
			Information regarding species distributions, Strategic Habitat Conservation Areas, conservation areas, and Hot Spots of biological resources in the Southwest Florida Region. Can be obtained from the Florida Fish and Wildlife Conservation Commission.	Vegetation communities, wetlands, invasive/exotic species, rare and unique uplands, native uplands, native vegetation communities, coastal and interior hammocks, rare and unique habitats, biodiversity "hot spots", native wildlife habitat, migratory bird habitat, critical habitat for listed species, important plant habitats, endangered plant species habitat, conservation lands under public ownership	
10-4	172	170b	Strategic Habitat Conservation Areas	Habitat areas for species	
10-5	173	170c	Hotspots of biological resources	Habitat areas of multi-species diversity	
11. Southwest Florida Feasibility Study					
11.1 Southwest Florida Feasibility Study- Feasibility Scoping Meeting Documentation					
11.1-1		Fig. 1	SWFFS Study Area Boundary		
11.1-2		Fig. 5	Lee County Future Land Use		
11.		Fig. 8	Pre-Development Vegetation Map		

DRAFT

1-3					
11. 1-4		Fig. 9	Study Area Map Depicting the 4 Main Watersheds and the Overlaps Between Watersheds		
11. 1-5		Fig. 10	Potential Restoration Sites in Study Area		
11. 1-6		Fig. 11	Species Richness		
11. 1-7		Fig. 12	Biodiversity Hotspots		
11. 1-8		Fig. 13	Unnatural Flows to the Coast		
11. 1-9		Fig. 14	SWFFS Restoration Projects (Phase I)		
11. 1-10		Fig. 15	SWFFS Modeling Suite Connectivity		
11.2 Southwest Florida Feasibility Study- Caloosahatchee Conceptual Model					
					No maps to include
11.3 Southwest Florida Feasibility Study- Big Cypress Conceptual Model					
					No maps to include
11.4 Southwest Florida Feasibility Study- April 2006 Scoping letter					
					Map attached to memo showing the Southwest Florida Feasibility Study area

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11.5 Southwest Florida Feasibility Study- project component map					
					This map is useful in depicting the location and geographic interrelationships of the planned components of the Southwest Florida Feasibility Study.
11.6 Southwest Florida Feasibility Study- Comprehensive Everglades Restoration Plan System-wide Performance Measures					
11.6-1	3-3	Fig. 9	Satellite image of physiographic regions in South Florida	This figure shows the 11 specific regional conceptual ecological models which have been developed for South Florida.	
11.6-2	3-12	Fig. 11	Performance measure review process		
11.6-3	4.0-1	Fig. 12	Boundaries of CERP regional modules		
11.7 Southwest Florida Feasibility Study- Greater Everglades Wetlands Conceptual Ecological Model					
11.7-1	4.3-2	Fig. 24		Presents the boundary of Greater Everglades Wetlands within influence of CERP.	This figure is useful because it shows this area in relation to the DR/GR lands.
11.8 Southwest Florida Feasibility Study- Northern Estuaries Conceptual Model					
11.8-1		Fig. 18	Boundary of Northern Estuaries within Influence of the CERP along the Gulf Coast.	This figure shows the location of the Caloosahatchee Estuary and its proximity to DR/GR lands.	

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11.9 Southwest Florida Feasibility Study- Caloosahatchee Estuary Salinity Envelope						
						No maps to include
11.10 Southwest Florida Feasibility Study- NE-7 Caloosahatchee Estuary Nutrient (TP and TN) Loading and Concentration						
						No maps to include
12. The South Florida Multi-species Recovery Plan						
12-1	2-60	Fig. 9	Existing Mitigation Service Areas (Federal) and Mitigation Banks in South Florida	Existing conservation areas		Should be updated periodically. Does not include state mitigation service areas.
12-2	3-198	Fig. 1	The Distribution of Hydric and Mesic Pine Flatwoods in South Florida (from USGS-BRD 1996)	Vegetation communities, wetlands, rare and unique uplands, native uplands, native vegetation communities		
12-3	3-481	Fig. 1	The Distribution of Forested Pond Swamps in South Florida (from USGS-BRD 1996)	Wetland vegetation communities		
12-4	3-501	Fig. 1	3-501 – The Distribution of Forested Pond Swamps in South Florida (from USGS-BRD 1996)	Wetland vegetation communities		
13. County Road 951 Project Development & Environmental Study						
13-1		Fig. 4-6	Drainage Map	Also includes existing waterways and flow-ways and proposed cross-drains and ponds.		In Wetlands Report. Southern part of DR/GR
13-2		Fig. 5-3	Wetland Location Map	Based on aerial photography, Natural Resources Conservation Service data, National Wetlands Inventory data, and		In Wetlands Report. Southern part of DR/GR

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				ground-truthing – includes wetlands Florida Land Use, Cover and Forms Classification System codes.	

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14. South Lee County Watershed Plan					
14-1	II-D 1-8		Baseline Conditions – Hydrologic Ranking		No directly useful maps.
14-2	II-D 1-9		Baseline Conditions – Ecological Assessment	Overall results of ecological assessment model	
15. Other Sources of DR/GR-Related Spatial Information					
15-1			Flow Ways Map		
15-2			Conservation 20/20 Map		