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October 19, 2017

Mr. Brandon Dunn
Lee County Planning Division
1500 Monroe Street
Fort Myers, FL 33901

RE: Babcock Comprehensive Plan Amendment
CPA2016-00013

Dear Mr. Dunn:

Enclosed please find responses to the Department of Economic Opportunities (DEO) comments received August 16, 2017. The following information has been provided to assist in your review of the petition:

3. Six (6) copies of the Comment Response Letter;
4. Six (6) copies of the revised Text Amendment;
5. Six (6) copies of the Infrastructure Analysis;
6. Six (6) copies of the MSKP Town and Country Utilities Water Conservation Plan; and
7. Six (6) copies of the Babcock Ranch Communities Water Demand & Wastewater Flow Projections prepared by CDM.

The following is a list of DEO recommendations with our responses in bold:

1. New Community Land Use Intensity and Mix of Uses: Revise Amendment 17-4DRI to establish a meaningful and predictable standard (e.g., percent distribution of mix among residential and nonresidential land uses) that defines the quantitative distribution of the mix of land uses in order to ensure that development within the New Community future land use category achieves and is consistent with the intended purposes stated in proposed Objective 1.6 and Policy 1.6.1 of a large-scale multi-use community with a balance and complete range of residential and nonresidential land uses. The distribution of mix among residential and non-residential land uses should be based on applicable units of measure such as: (1) gross acres residential and gross acres non-residential; or (2) residential dwelling units and non-residential square feet, which define the quantitative mix of residential and non-residential land uses. Revise Amendment 17-4DRI to establish a meaningful and predictable standard for the intensity of non-residential land uses allowed within the New Community future land use category. For the intensity of non-residential land uses, the amendment could establish quantitative caps on the minimum and maximum potential amounts of non-residential land uses (based on units of measure such as gross non-residential or non-residential square feet).

   RESPONSE: Please refer to the revised Text Amendment document attached. Policy 35.11.1 has been revised to include a maximum number of dwelling units (1,630 du) in addition to the maximum density of 1 du/2.5 acres.

Similarly, Policy 35.11.2 has been revised to include a maximum commercial square footage (1,170,000 s.f.) and 600 hotel rooms, in addition to the maximum intensity of 0.15 Floor Area Ratio (FAR).

In terms of ensuring a balance of residential and non-residential uses, the initial phases of development in the Charlotte County portion of Babcock Ranch demonstrate retail, office, institutional and residential uses. Specifically, 60,000 square feet of non-residential uses are constructed, or are under construction in the downtown area, also known as Founder's Square, which is geographically proximate to the Lee County New Community lands and can serve residents of the development. The residential components currently under construction entail approximately 900 dwelling units. This initial phase of development is demonstrative of the mix of uses that will be developed in both Lee and Charlotte Counties.

To provide further assurance that the project will contain a mix of uses, the Applicant has included the following language in proposed Policy 35.11.1:

> *"Before issuance of the certificate of occupancy for the 1,000th residential dwelling unit, a minimum of 50,000 square feet of non-residential floor area must be under construction within the Planned Development."*

2. Transportation: Revise Amendment 17-4DRI to establish meaningful and predictable standards regarding the mix of residential and non-residential land uses and the non-residential intensity of use as recommended per Objection 1 of this Report. Revise the Amendment 17-4DRI transportation long-range analysis to: (1) be based upon land use assumptions that are consistent with the future land uses (land use types and mix and maximum densities/intensities of land uses) allowed by Amendment 17-4DRI; and (2) address the deficiencies/inconsistencies identified in item numbers 2, 3, 4, 8, 9, 10 and 11in the Florida Department of Transportation (FDOT) Memorandum (dated July 14, 2017) as referenced in their letter of July 14, 2017, reviewing the proposed plan amendment (letter and memorandum are enclosed); (3) analyze the projected future roadway level of service standards based on best available data/analysis of the future land uses proposed for the subject amendment property and background growth; and (4) address the long-range roadway network shown on the adopted future transportation map (map series) of the Lee County Comprehensive Plan, and identify any amendments that are needed to the adopted future transportation map (map series) in order to meet the level of service standards for the long-range. Revise Amendment 17-4DRI based on the data/analysis, to include any amendments that are needed to the Lee County Comprehensive Plan adopted future transportation map (map series) in order to coordinate future land use and transportation planning in the Lee County Comprehensive Plan.

   Given the short buildout anticipated for the project, the County should consider revising the amendment data and analysis to include a short-term (five-year) and buildout (year 2026) transportation analysis in order to identify potential impacts of Amendment 17-4DRI to the State Highway System, particularly State Road 31, State Road 78, State Road 80, and Interstate-75 as requested by FDOT. The short-term analysis consider best available data and analysis, including reasonable assumptions, regarding the amount of development (on the subject amendment property and background growth) within the five-year timeframe, and the buildout analysis should consider best available data and analysis regarding the anticipated amount of development at

buildout on the subject amendment property and background growth. In considering the short-term analysis, the County should review the methodology and assumptions for the long-term analysis identified above for consistency. Also consideration should be given to analyzing the coordination of any needed roadway facility improvements with the Lee County Comprehensive Plan Capital Improvements Element Five-Year Schedule of Capital Improvements in order to meet the level of service standards for the short-range timeframe.

RESPONSE: Comments are noted. The Applicant is coordinating with FDOT Staff on the revised traffic study and supportive analysis. The updated study will be provided upon completion.

3. Water Supply, Potable Water and Sanitary Sewer Facilities: The amendment data and analysis should be revised to support the plan amendment with the following quantitative information: (1) the amount of projected demands on potable water and sanitary sewer facilities created by the maximum development potential of the plan amendment; (2) the amount of permitted potable water withdrawal; (3) the amount of planned capacity of the water treatment facility and wastewater treatment facility; (4) the amount of projected demands from the entire service area of the water treatment facility and the entire service area of the wastewater treatment facility; (5) demonstration that the amount of planned available capacity of water supply, potable water facilities and wastewater facilities is adequate to serve the projected demands from the amendment property and other development anticipated to be served by the facilities; and (6) identification of any additional water supply, potable water and sanitary sewer facilities needed to serve the projected demands. Revise the amendment, if necessary, to be supported by the data and analysis.

RESPONSE: The following information is provided in response to the above questions and recommendations.

(1) The amount of projected demands on potable water and sanitary sewer facilities created by the maximum development potential of the plan amendment:

Per the attached Infrastructure Analysis, the projected demand for potable water and sanitary sewer upon build-out of the density and intensity authorized by this plan amendment is 567,000 GPD for both water and sewer. This calculation is based upon the maximum attainable unit count and commercial square footage set forth in Policies 35.11.1 & 35.11.2, and the Lee County Utilities Design Manual, Sections 2 & 3.

(2) The amount of permitted potable water withdrawal:

The public water supply withdrawals to support the amendment will be permitted in phases. The current water use permit issued by the SFWMD (08-00122-W) permits an annual allocation of 282.84 Million Gallons (MG), equivalent to 77,904 GPD. The permit also establishes a maximum monthly allocation of 35.34 MG, equivalent to approximately 1,178,000 GPD. All permitted allocations are for raw water withdrawals, and account for standard treatment and distribution system efficiencies and losses. It is anticipated that the water use permit will be modified at no greater

than 5-year increments to increase the permitted allocation to accommodate the demand through build-out of the Charlotte DRI and Lee County lands subject to this Comprehensive Plan Amendment application.

(3) *The amount of planned capacity of the water treatment facility and wastewater treatment facility.*

The water (WTP) and wastewater treatment plants (WWTP) owned and operated by MSKP Town & Country Utilities, LLC have a current capacity of 0.25 MGD and 0.2 MGD, respectively, to serve Phase I development in Charlotte County. Expansions to the plants are planned in phases to accommodate the projected demands above. In fact, the Applicant has permitted the expansion of the WTP to 0.99 MGD for Phase 2 of development, and is in the process of permitting the WWTP expansion to 0.75 MGD. The current design buildout of the WTP and WWTP is 5.5MGD and 5.0 MGD, respectively, which is expected to provide adequate capacity based on the significant conservation measures which will be used for developments within the Charlotte DRI and the Lee County lands. However, each of these treatment facilities can be further expanded as necessary to meet the needs of the combined demand from the Charlotte DRI and Lee County lands for water and wastewater treatment facilities if conservation targets are not realized.

(4) *The amount of projected demands from the entire service area of the water treatment facility and the entire service area of the wastewater treatment facility.*

- CDM prepared the attached demand analysis for the DRI, which assumed 19,221 dwelling units (49,208 Population based upon 2.56 persons per ERU) and 6,000,000 SF of commercial uses.

- Per the attached data and analysis prepared by CDM, the total residential water demand at build-out is 4,330,332 GPD and total commercial water demand is 1,629,216 GPD (See Table 9 on page 13) for the Charlotte DRI alone

- Total residential wastewater demand at build-out is 3,897,299 GPD and total commercial wastewater demand is 1,466,294 GPD for the Charlotte DRI alone.

- Total maximum build-out of the Charlotte DRI lands and Lee County lands is 19,500 DU and 6,000,000 SF of commercial uses. Therefore, an additional 279 DU in Lee County, generating an additional 69,750 GPD of water and wastewater demand, could be generated by the proposed Comprehensive Plan Amendment to establish the most conservative combined demand projection for both projects.

- Resulting Combined Total Utilities Demand (Charlotte DRI plus Lee County Lands) is summarized as follows:

DEMANDS	GPD
Residential Water Demand	4,400,082 GPD
Commercial Water Demand	1,629,216 GPD
TOTAL PROJECTED WATER DEMAND AT BUILD-OUT	*6,029,298 GPD*
Residential Wastewater Demand	3,967,049 GPD
Commercial Wastewater Demand	1,466,294 GPD
TOTAL PROJECTED WASTE WATER DEMAND AT BUILD-OUT	*5,433,343 GPD*

(5) *Demonstration that the amount of planned available capacity of water supply, potable water facilities and wastewater facilities is adequate to serve the projected demands from the amendment property and other development anticipated to be served by the facilities:*

While the current design buildout of the WTP and WWTP is 5.5MGD and 5.0 MGD, respectively, the design is expected to provide adequate capacity based on the significant conservation measures which will be used for developments within the Charlotte DRI and the Lee County lands. However, each of these treatment facilities can be further expanded as necessary to meet the needs of the combined demand from the Charlotte DRI and Lee County lands for water and wastewater treatment facilities if conservation targets are not realized.

Attached please find a copy of the Town & Country Utilities water conservation plan that was provided at part of the 2015 water use permit modification for the PWS system, and the most recently adopted Babcock Ranch DRI Master Development Order. The water conservation plan and DRI require various mandatory conservation measures that will also apply to the Lee County lands served by Town & Country Utilities. These measures include, but are not limited to: low-flow plumbing fixtures and mandatory year-round landscape irrigation conservation measures. Implementation of the water conservation plan is required per Special Condition 16 of the TCU Water Use Permit. The South Florida Water Management District also requires a water conservation plan for PWS systems similar to the attached documents, thereby providing additional enforcement and oversight.

The projected water and wastewater demands provided above are conservatively based on conventional demand rates for single family residences that may use potable water for landscape irrigation. Both Charlotte and Lee County portions of the Babcock Ranch Community will be served by a centralized, dedicated irrigation system using reuse water and surface water, and supplemented with groundwater, as needed. Similar developments, such as Ave Maria, with new PWS systems and dedicated irrigation systems have reported historical per capita potable water usage below 65 gpdpc, or approximately 165 GPD per single family residence based on 2.5 persons per household (figures from SFWMD permit app. #150724-8). Assumed per capita usage rates for the Town and Country PWS system are 100 gpdpc or an equivalent 250 GPD per single family residence (Figures provided in #1 above). Historical usage for new communities with dedicated PWS and irrigation systems indicate the projected potable water demands provided under #1 above may be 35% lower in reality due to elimination of potable water use for irrigation. Applying the 35% reduction due to conservation measures to the potable water demands provided above results in a total demand at buildout of 3,919,044 GPD. Based on the design buildout of the WTP of 5.5 MGD (provided under #2), this results in a surplus capacity plant of 1,580,956 GPD.

(6) *Identification of any additional water supply, potable water and sanitary sewer facilities needed to serve the projected demands.*

In the event additional facilities are needed to serve the projected demands, the Applicant will expand the WTP and WWTP as needed to meet the combined demands from the Charlotte DRI and Lee County lands subject to this amendment. As noted in the previous response, the DRI DO and Lee County MPD will require significant conservation measures, which are anticipated to reduce the demand for potable water and sewer.

Please also note, the Applicant is proposing additional verbiage in Policy 35.11.3.c.1 to allow unmanned essential services to connect to well and septic on a temporary basis, until such time as centralized water and sewer services are available to the project.

Thank you for your consideration of this additional information. If you have any further questions, please contact me directly at (239) 405-7777 ext. 207, or alexis.crespo@waldropengineering.com.

Sincerely,

WALDROP ENGINEERING, P.A.

Alexis V. Crespo, AICP, LEED AP
Vice President of Planning

Enclosures

cc: Gary Nelson, Kitson & Partners Communities
Erica Woods, Kitson & Partners Communities
Russell Schropp, Henderson, Franklin, Starnes & Holt P.A.
Linda Shelley, Buchanan Ingersoll & Rooney, PC
Amy Wicks, P.E., Kimley-Horn & Associates
Laura Herrero, Johnson Engineering
Kim Arnold, P.G., Johnson Engineering
Stephen Leung, David Plummer & Associates

Text Amendments:

OBJECTIVE 1.6: NEW COMMUNITY. Designate on the Future Land Use Map areas which are suitable for the development of large-scale multi-use communities developed pursuant to an overall ~~master~~ Pplanned Development. ~~This category is also considered a Future Urban Area.~~

POLICY 1.6.1: New Community areas are lands that are capable of being planned and developed as a cohesive unit in order to better achieve conservation of important environmental resources and to initiate areawide surface water management. New Community land must be located such that the area is capable of being developed with a balance of residential and nonresidential uses and that major impacts of the development are internalized and/or alleviated by infrastructure that is existing or will be funded privately. New Community areas will be developed as freestanding economic units and will not impose negative fiscal impacts on the county (other than those associated with the delay in placing property improvements on the tax rolls).

New Communities will not exceed a residential density of one unit per 2.5 gross acres (1 du/2.5 acres), except within the Gateway/Airport Planning Community, where residential densities of up to six dwelling units per gross acre may be permitted. Development within the New Community future land use category ~~and~~ must have at least the following characteristics:

1. The land will be developed under a well-conceived overall ~~master plan~~ Planned Development;
2. The land can be served with all necessary facilities and services at no expense to the county. Uniform Community Development Districts and special taxing districts may be utilized toward achieving this objective;
3. Population, recreation, open space, educational, office, and research facilities are distributed in an orderly and attractive manner;
4. The land must be developed in such a manner as to protect environmentally sensitive areas;
5. The land must be developed as a free-standing community offering a complete range of land uses (e.g. a full mix of housing types for a range of household incomes, industrial and office
   employment centers, and community facilities such as fire departments, schools, law enforcement offices, public recreational areas, health care facilities, and community commercial areas);
6. Off-site impacts must be mitigated; ~~and,~~
7. On-site levels of service must meet the county-wide standards contained in this plan.~~;~~
8. The land area must exceed a minimum of 2,000 acres to ensure an appropriate balance of land uses; and
9. The land must be developed consistent with Goal 35 if located within the North Olga Community Planning Area identified on Lee Plan Map 1, Page 2.

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GOAL 35: NORTH OLGA COMMUNITY. To promote and support North Olga's unique rural character, heritage, economy, ~~and~~ quality of life, and natural resources ~~by establishing a participatory community planning efforts to guide North Olga's future~~. For the purpose of this Goal, the North Olga Community boundaries are defined by Map 1, Page 2 of 8 of the Lee Plan.

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OBJECTIVE 35.3: COMMERCIAL LAND USES. Existing and future county regulations, land use interpretations, policies, zoning approvals, and administrative actions should promote the rural character within the North Olga community boundaries and allow for non-residential land uses that serve and support the rural community, including uses permitted by Objective 35.11. County regulations will support a unified and attractive rural-oriented design theme in terms of landscaping architecture, lighting and signage.

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POLICY 35.3.4: Opportunities for non-residential and mixed-use development that are compatible with the rural and agricultural character of the community may be permitted through the Planned Development rezoning process within the New Community future land use category in accordance with Objective 35.11.2.

OBJECTIVE 35.4: ECONOMIC DEVELOPMENT. Encourage future economic development opportunities in the North Olga Community including, but not limited to those industries that identify and promote the rural and agricultural-based quality of life for the residents and surrounding communities, retain and expand eco-tourism, agri-tourism, and where projects demonstrate a clustered and well-planned development footprint, and protection of natural resources and the rural character of the surrounding community.

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OBJECTIVE 35.11: NEW COMMUNITY. Land designated as New Community on the Future Land Use Map within the North Olga Community will be developed as a unified Planned Development in order to achieve conservation and enhancement of important environmental resources; initiate areawide surface water management; prevent sprawling land use patterns; create critical hydrological and wildlife corridors and connections; and protect rural character of the surrounding community.

POLICY 35.11.1: Residential densities for land within the New Community future land use category may be permitted up to a maximum of 1 du/2.5 acres. In no case shall the unit count in the New Community future land use category in North Olga exceed 1,630 dwelling units. Before issuance of the certificate of occupancy for the 1,000th residential dwelling unit, a minimum of 50,000 square feet of non-residential floor area must be under construction within the Planned Development.

POLICY 35.11.2: Non-residential intensities for lands within the New Community future land use category will be limited to a maximum permitted Floor Area Ratio (FAR) of 0.15. The FAR will be based upon the gross acreage dedicated to non-residential uses within the overall Planned Development boundary, including all uplands, wetlands, open space, rights-of-way, recreation areas, and/or lake. In no case shall the total commercial square footage in the New Community future land use category in North Olga exceed 1,170,000 square feet, in addition to 600 hotel rooms.

POLICY 35.11.3: Prior to development, a Planned Development rezoning must be approved, and include conditions and requirements that demonstrate the following:

a. Environmental Enhancements.

1. A minimum of 60 percent open space, inclusive of onsite preserve, to accommodate the following:

    i. Water quality enhancement areas, including but not limited to natural systems-based stormwater management facilities, filter marshes, and wetland buffers to reduce the rate of run-off and associated nutrient loads;
    ii. Existing regional flowways;
    iii. Preservation of 90% of the onsite wetlands;
    iv. Critical wildlife connection(s) to adjacent conservation areas through on-site preserve areas;
    v. Roadway setbacks and perimeter buffers; and
    vi. Passive recreational and civic areas that comply with the definition of open space, as set forth in the Land Development Code.

2. Open space areas must be platted in separate tracts, outside of privately owned lots, and dedicated to an appropriate maintenance entity. A Community Development District (CDD), Independent Special District (ISD), or a master property owners association must be created to accept responsibility for perpetually maintaining the open space areas identified in the Planned Development.

3. Record a conservation easement for a minimum of 50 percent of the Planned Development benefiting a public agency acceptable to Lee County, or Lee County itself, and dedicated to an appropriate maintenance entity. Land subject to conservation easement(s) can be used for on-site mitigation and will be recorded as development orders are issued. The timing of conservation easement(s) and restoration may be phased so long as the area dedicated to conservation easement is equal to or greater than the area of land approved for development on a cumulative basis.

4. Provide a protected species management plan to address human wildlife coexistence, including educational programs and development standards.

5. Provide wildlife crossings on-site and to adjacent wildlife habitat areas.

6. Provide recreational connections to adjacent public and private conservation and preserve land, subject to approval by the appropriate agencies, through the provision of publicly accessible trailheads and similar facilities within the development.

7. Incorporate Florida friendly plantings with the low irrigation requirements in common areas.

8. A binding commitment as part of the Planned Development to implement an environmental education program for homeowners, businesses and visitors to describe the local ecology, including but not limited to wildlife, plant communities, and native habitats, in addition to the design standards, restoration projects, and management programs/plans, incorporated into the development to

address environmental protection.

9. Incorporate energy efficiency and other low impact development (LID) performance standards within the development.
10. Minimize impacts to natural areas and native habitat by concentrating development primarily in areas previously impacted by agricultural uses and other development activities.

b. Water Quality & Hydrological Enhancements.

1. The stormwater management system must demonstrate through design or other means that water leaving the development meets current state and federal water quality standards. Outfall monitoring will be required on a quarterly basis for a minimum of 5 years from the date of acceptance of construction of the water management system by the South Florida Water Management District. Monitoring may be eliminated after 5 years if the water quality standards are met.

2. Demonstrate an additional 50% water quality treatment beyond the treatment required by the SFWMD for the on-site stormwater management basins.

3. Protect existing groundwater levels and improve existing wetland hydroperiods in onsite preserve areas, as applicable by SFWMD permits.

4. Provide a lake management plan that requires best management practices for the following:

   i. fertilizers and pesticides;
   ii. erosion control and bank stabilization; and
   iii. lake maintenance requirements and deep lake management for lakes exceeding 12 feet below lake surface (BLS).

5. A site-specific ecological and hydrological plan, which includes at a minimum the following: preliminary excavation and grading plans, exotic removal and maintenance plan, supplemental planting plan, and success criteria for meeting established goals.

6. A site-specific mitigation and enhancements to reduce discharge rates.
7. Utilize reuse and surface water generated by the development to meet the irrigation demands of the recreation and development areas, to the extent such reuse is available.

8. Demonstrate that the proposed Planned Development will not result in significant detrimental impacts on present or future water resources.

c. Infrastructure Enhancements.

1. All development within the Planned Development must connect to centralized water and sewer services, with the exception of interim facilities used on a temporary basis during construction, and for unmanned essential services on a temporary basis until water and sewer service is extended to the development.

2. Written verification as to adequate public services for the Planned Development, from the sheriff, EMS, fire district, and Lee County School District, or via interlocal agreements with adjacent jurisdictions and/or special districts.

3. Civic space, recreational areas, and a variety of amenities distributed throughout the development for use by the general public, to be maintained by the property owners' association or similar entity.

4. Sufficient right-of-way to accommodate an 8-foot wide multi-purpose pathway along the roadway frontages, where the Planned Development abuts SR 31 and CR 78.

d. Community Character.

1. Transition to lower densities and intensities where adjacent to off-site conservation lands.

2. Enhanced buffers and setbacks along external roadways to preserve rural vistas and viewsheds that are at least 50% wider than the Land Development Code requirements.

3. Locate access points onto adjacent arterial roadways to minimize impact to the surrounding rural community.

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VII. CONSERVATION AND COASTAL MANAGEMENT

POLICY 114.1.1: Development in wetlands is limited to very low density residential uses and uses of a recreational, open space, or conservation nature that are compatible with wetland functions. The maximum density in the Wetlands category is one unit per 20 acres, except that one single family residence will be permitted on lots meeting the standards in Chapter XIII of this plan, and except that owners of wetlands adjacent to Intensive Development, Central Urban, Urban Community, Suburban, New Community, and Outlying Suburban areas may transfer densities to developable contiguous uplands under common ownership in accordance with Footnotes 9b and 9c of Table 1(a), Summary of Residential Densities. In Future Limerock Mining areas only (see Map 14), impacts to wetlands resulting from mining will be allowed by Lee County when those impacts are offset through appropriate mitigation, preferably within Southeast Lee County (see also Policy 33.1.3). Appropriate wetland mitigation may be provided by preservation of high quality indigenous habitat, restoration or reconnection of historic flowways, connectivity to public conservation lands, restoration of historic ecosystems or other mitigation measures as deemed sufficient by the Division of Environmental Sciences. It is recommended that, whenever possible, wetland mitigation be located within Southeast Lee County. The Land Development Code will be revised to include provisions to implement this policy.

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XII. GLOSSARY

FUTURE SUBURBAN AREAS - Those future urban categories on the Future Land Use Map that are designated primarily for single use developments: Suburban, Outlying Suburban, Sub-Outlying Suburban, Industrial Development, Airport, Tradeport, Commercial, Industrial Interchange, General Commercial Interchange, Industrial Commercial Interchange, University Village Interchange, University Community, Public Facilities, and New Community within the Gateway/Airport Planning Community.

FUTURE NON-URBAN AREAS - Those categories on the Future Land Use Map that are designated primarily for single use developments with a density equal to or less than 1 unit per acre: Rural, Rural Community Preserve, Coastal Rural, Outer Island, Open Lands, Wetlands, Conservation Lands (upland and wetland), New Community within the North Olga Planning Community and Density Reduction/Groundwater Resource.

XII. GLOSSARY

FUTURE SUBURBAN AREAS - Those future urban categories on the Future Land Use Map that are designated primarily for single use developments: Suburban, Outlying Suburban, Sub-Outlying Suburban, Industrial Development, Airport, Tradeport, Commercial, Industrial Interchange, General Commercial Interchange, Industrial Commercial Interchange, University Village Interchange, University Community, Public Facilities, and New Community within the Gateway/Airport Planning Community.

FUTURE NON-URBAN AREAS - Those categories on the Future Land Use Map that are designated primarily for single use developments with a density equal to or less than 1 unit per acre: Rural, Rural Community Preserve, Coastal Rural, Outer Island, Open Lands, Wetlands, Conservation Lands (upland and wetland), New Community within the North Olga Planning Community and Density Reduction/Groundwater Resource.

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Babcock Comprehensive Plan Amendment
Exhibit IV.B.2 – Infrastructure Analysis

REVISED OCTOBER 2017

I. Sanitary Sewer

LOS Standard = 250 GPD

Existing Future Land Use – DR/GR
434 single-family dwellings @ 250 GPD = 108,500 GPD

TOTAL EXISTING DEMAND: 108,500 GPD

Proposed Land Use – North Olga New Community
980 single-family @ 250 GPD = 245,000 GPD
650 multi-family @ 200 GPD = 130,000 GPD
870,000 sq. ft. retail @ 0.1 GPD/1 sq. ft. = 87,000GPD
300,000 sq. ft. office @ 15 GPD/100 sq. ft. = 45,000 GPD
600 hotel rooms @ 100 GPD = 60,000 GPD

TOTAL PROPOSED DEMAND: 567,000 GPD

The proposed comprehensive plan amendment results in an increased sanitary sewer demand of 458,500 GPD.

The Property is located in the Babcock Ranch Community Independent Special District, and will be provided sanitary sewer services by MSKP Town & Country Utility, LLC. Please refer to the enclosed availability letter confirming availability and capacity from this entity.

II. Potable Water

LOS Standard = 250 GPD

Existing Future Land Use – DR/GR
434 single-family dwellings @ 250 GPD = 108,500 GPD

TOTAL EXISTING DEMAND: 108,500 GPD

Proposed Land Use – North Olga New Community
980 single-family @ 250 GPD = 245,000 GPD
650 multi-family @ 200 GPD = 130,000 GPD

870,000 sq. ft. retail @ 0.1 GPD/1 sq. ft. = 87,000 GPD
300,000 sq. ft. office @ 15 GPD/100 sq. ft. = 45,000 GPD
600 hotel rooms @ 100 GPD = 60,000 GPD

TOTAL PROPOSED DEMAND: 567,000 GPD

The proposed comprehensive plan amendment results in an increased sanitary sewer demand of 458,500 GPD.

The Property is located in the Babcock Ranch Community Independent Special District, and will be provided potable water services by MSKP Town & Country Utilities. Please refer to the enclosed availability letter confirming availability and capacity from this agency.

III. Surface Water Management

The Property is located within the Caloosahatchee Watershed and Drainage Basin.

LOS Standard = 25 year, 3-day storm event of 24 hours' duration.

The Applicant has obtained an Environmental Resource Permit (ERP) from the South Florida Water Management District (SFWMD) and is deemed concurrent based upon this approval.

IV. Public Schools – East Zone, E-2

Current Public Schools LOS Standard = 100% of the Permanent Inventory of Public Schools (FISH) capacity.

Existing Future Land Use – DR/GR
434 single-family @ 0.147 elementary school = 63.79 students
434 single-family @ 0.071 middle school = 30.81 students
434 single-family @ 0.077 high school = 33.41 students
Total = 128 students

TOTAL EXISTING DEMAND = 128 students

Proposed Land Use – North Olga New Community
980 single-family @ 0.147 elementary school = 144.06 students
980 single-family @ 0.071 middle school = 69.58students
980 single-family @ 0.077 high school = 75.46 students
Total = 289.1 students

650 multi-family @ 0.044 elementary school = 28.6 students
650 multi-family @ 0.021 middle school = 13.65 students

650 multi-family @ 0.023 high school = 14.95 students
Total = 57.2 students

TOTAL PROPOSED DEMAND = 346 students

Elementary Schools
Projected 2015-2016 Permanent FISH Capacity= 7,081
Available Capacity = 1,357
Middle Schools
Projected 2015-2016 Permanent FISH Capacity = 3,721
Available Capacity = -553

High Schools
Projected 2015-2016 Permanent FISH Capacity = 4,050
Available Capacity = -189

The amendment results in the addition of 218 students. No breakdown is available for elementary, middle or high school ages. There is adequate capacity based on the 2015- 2016 projections outlined in the 2015 Lee County Concurrency Report. Please also refer to the letter of availability provided by The Lee County School District, which states there is a deficit for middle and high schools in the CSA; however, there are sufficient seats available to serve the need within the contiguous CSA.

*Please note due to recent legislative changes, the approved Public Charter School within
the Town of Babcock Ranch can also accommodate students from Lee County, including
those generated by the proposed amendment.

V. Parks, Recreation and Open Space

*It is noted that Lee County no longer evaluates Parks and Recreation for concurrency purposes. The following analysis is provided for informational purposes only, and demonstrates adequate park facilities are available to service the demand generated by the amendment.

Current Regional Parks LOS Standard = 6 acres of Regional Parks per 1,000 seasonal Residents

Current Community Parks LOS Standard = 0.8 acres per 1,000 permanent residents

Existing Future Land Use – DR/GR
434 single-family dwellings @ 2.5 people per household = 1,085 people

Proposed Land Use – North Olga New Community
980 single-family dwellings @ 2.5 people per household = 2,450 people

650 multi-family dwellings @ 2.55 people per household = 1,658 people
Total = 4,108 people

Regional Parks @ 6 acres/1,000 = 24.65 acres required
Community Parks @ 0.8 acres/1,000 = 3.286 acres required

The Property is located in the East Community Park Benefit District #52. According to the 2015 Concurrency Report, there are 337 acres of Community Park within the district, which far exceeds the acres required. No additional Community Parks are required as a result of
this amendment.

There are currently 7,235 acres of existing Regional Parks currently operated by the County, City, State and Federal government. This acreage is sufficient to meet the LOS standard of six (6) acres per 1,000 total seasonal population in the County for the year 2015, and will continue to do so at least through the year 2020 as currently projected. As such, no additional Regional Parks are required as a result of this amendment.

Section E5

Water Conservation

The MSKP Town and Country Utility system will implement the following Water Conservation Plan. It is a standard conservation plan.

Permanent Irrigation Ordinance: MSKP Town and Country Utility does not have authority to adopt ordinances, but supports SFWMD and Charlotte County rules and ordinances limiting landscape irrigation days and times.

Landscape Ordinance: MSKP Town and Country Utility does not have authority to adopt ordinances, but supports SFWMD and Charlotte County rules and ordinances encouraging use of Florida Friendly landscaping.

Plumbing Fixture Ordinance: MSKP Town and Country Utility does not have authority to adopt ordinances requiring the use of ultra-low flow volume plumbing fixtures.

Rain Sensor Ordinance: MSKP Town and Country Utility does not have authority to adopt ordinances requiring the use of rain sensors for automatic sprinkler systems. Rain sensors will be incorporated in the irrigation system design for the Babcock Ranch Community in order to avoid excess irrigation during wet weather.

Low Flow Fixtures: Ultra-low volume plumbing fixtures will be installed in all new homes and businesses. The plumbing fixtures will comply with the following maximum flow volumes at 80 psi:

Toilets: 1.6 gallons per flush
Shower heads: 2.5 gallons per minute
Faucets: 2.0 gallons per minute

Rate Structures: Customer billing will be based on the use of water conservation-based rate structures. The rate structure will incorporate at least one or more of the following: increasing block rates, seasonal rates, quantity based surcharges, and/or time of day pricing.

Leak Detection: The utility will implement leak detection programs in the event water losses exceed 10 percent. Reports of water leaks will be directed to personnel during working hours. Site

tours and routine maintenance personnel trips along water supply and distribution lines will also be conducted. On a monthly basis, metered usage will be compared to the master potable supply meter reading.

Public Education:

The utility will implement public education programs, including, but not limited to, distribution of literature to households describing water conservation practices.

Irrigation:

The utility will provide irrigation water via a separate distribution system strictly dedicated to that purpose, or individual developments will be responsible for providing irrigation water separate from the potable supply system. The utility will convert treatment plant effluent to reclaimed water, which will be used for irrigation to the greatest extent feasible. All irrigation systems will adhere to the water conservation measures described in Subsection 2.3.2.F.1.a of the SFWMD Applicant's Handbook for Water Use Permit Applications.

Plan Review:

The Water Conservation Plan will be reviewed by management on an annual basis and will have changes incorporated in the plan at that time.

CDM

Memorandum

To: *Michael Acosta, P.E., Director of Utility Operations*
Kitson Babcock, LLC

From: *Clay Tappan, P.E., BCEE, CDM*
Marc Stonehouse, P.E., CDM

Date: *December 17, 2010*

Subject: *MSKP Town and Country Utility, LLC - Babcock Ranch Communities Water Demand and Wastewater Flow Projections Memo – 2nd Draft*

The purpose of this Memorandum is to provide water demands and wastewater flow projections for the Babcock Ranch development. A review of existing documents included the following:

- Babcock Ranch Development Master Plan, by others - 2007
- Development of Regional Impact (DRI) Application and responses, by others -2007
- *Town and Country Utilities Company, Babcock Ranch Water and Wastewater Facilities, Master Plan*, October 2007, CDM
- *Babcock Ranch Community Water and Wastewater Systems, Preliminary Design Report*, March 2008, CDM
- Babcock Ranch, Updated Absorption Summary, 2010
- Charlotte County Comprehensive Plan
- Ten State Standards

Introduction

The proposed development of the Babcock Ranch is shown on **Figure 1** at the end of this memorandum. Construction is planned using a phased approach which allows for the water and wastewater treatment plants, as well as the raw water supply, to be constructed in smaller initial increments that can be expanded as the development grows. These treatment plants are located on the proposed Utility Site (Light Industrial area on Figure 1). As the development of residential, commercial and institutional properties occurs in the various communities (Town, Villages and Hamlets), the infrastructure needed to serve the population

will need to be in place. In preparation for infrastructure design, this memo develops water demands and wastewater flow projections.

A review of the updated absorption schedule provided by Kitson Babcock, LLC indicated that the timeline for the phased developments has shifted. Residential home closings are now projected to begin in 2013 instead of 2010 (original projection) and commercial development will begin in 2014. Current projections indicate that all commercial flows are anticipated to be in the Town Center and Center Village sections of the development. Although the timeline has shifted, the overall number of residential homes and commercial areas remains relatively unchanged.

The updated absorption schedule for residential home closings by community was utilized to project the water demands and wastewater flows for residential units. However, because the historical data provided in the Development of Regional Impact Application documents for the commercial developments provide greater detail for the types and size of commercial developments, which is needed to determine the projected water and wastewater needs, historical data was utilized to calculate the water demands and wastewater flow projections for the commercial developments presented in this memo.

Population Projections for Residential Development

The master plan which was prepared for the Babcock Ranch Development used a residential occupancy rate of 2.56 persons per equivalent residential unit (ERU). This same residential occupancy rate has been utilized for this memo. The 2010 absorption schedule included a breakdown for the number of home closings by year for each community and this data was utilized for the development of population projections (**Table 1**). Because the development areas will be added in phases, the following population projections are broken down within each phase by the approximate relative area that the respective community contributes.

Levels of Service

Charlotte County's Comprehensive Plan (Chapter 4 – Potable Water and Sanitary Sewer Section) provides Levels of Service (LOS) for water and wastewater flow projections. These are 225 gallons per day (gpd)/ERU for potable water and 190 gallons per day/ERU for wastewater.

The Charlotte County Comprehensive plan notes that 225 gpd/ERU for potable water demands is a conservative estimate simulating maximum day water demands and that "Actual average day demands have historically been significantly lower (e.g., 156 gpd/ERU)." The County's Comprehensive Plan lists the County average ERU density at 2.18 persons per ERU which translates into a water demand rate of 103 gallons per capita day (gpcd). Using the residential density of 2.56 persons/ERU for the Babcock Ranch development, the estimated potable water demand reduces to 88 gpcd. In comparison, using the historical average day water demands of 156 gpd/ERU seen for Charlotte County with the County's ERU density of 2.18, provides an average day potable water demand of 72 gpcd.

Table 1
Population Projections

Phase I (2013 - 2018)					
Community	Total Number of Units	% in Phase	Number of Developed Units	Persons per Unit	Total Population
Village Center	3,616	2.93%	106	2.56	271
Village III	1,700	72.35%	1,230	2.56	3,149
Town Center	7,071	30.31%	2,143	2.56	5,486
Hamlet I	1,351	51.37%	694	2.56	1,777
Totals			**4,173**		**10,683**
Phase II (2019 - 2023)					
Community	Total Number of Units	% in Phase	Number of Developed Units	Persons per Unit	Total Population
Village Center	3,616	61%	2,190	2.56	5,606
Village III	1,700	28%	470	2.56	1,203
Town Center	7,071	26%	1,826	2.56	4,675
Hamlet I	1,351	49%	657	2.56	1,682
Hamlet II	1,589	56%	888	2.56	2,273
Totals			**6,031**		**15,439**
Phase III (2024 - 2028)					
Community	Total Number of Units	% in Phase	Number of Developed Units	Persons per Unit	Total Population
Village Center	3,616	32%	1,142	2.56	2,924
Village IV	1,694	17%	281	2.56	719
Town Center	7,071	29%	2,064	2.56	5,284
Hamlet II	1,589	44%	701	2.56	1,795
Hamlet III	1,219	67%	813	2.56	2,081
Hamlet IV	553	33%	184	2.56	471
Hamlet V	429	11%	46	2.56	118
Totals			**5,231**		**13,391**
Phase IV (2029 - 2033)					
Community	Total Number of Units	% in Phase	Number of Developed Units	Persons per Unit	Total Population
Village Center	3,616	5%	178	2.56	456
Village IV	1,694	83%	1,413	2.56	3,617
Town Center	7,071	15%	1,038	2.56	2,657
Hamlet III	1,219	33%	406	2.56	1,039
Hamlet IV	553	67%	369	2.56	945
Hamlet V	429	89%	383	2.56	980
Totals			**3,787**		**9,695**
Grand Totals			**19,222**		**49,208**

The County LOS for wastewater flow projections of 190 gpd/ERU includes a peaking factor of 1.160 to account for inflow and infiltration (I&I) seen during storm events. Using the County's ERU density of 2.18 persons per ERU, wastewater flows are projected at 87 gpcd. Using the residential density of 2.56 persons/ERU for the Babcock Ranch development, the estimated wastewater flow reduces to 74 gpcd. Charlotte County's actual wastewater flow without the peaking factor for I&I is approximately 164 gpd/ERU. Estimating the wastewater flows without the I&I peaking factor with the County's residential density of 2.18 persons per ERU, results in estimated wastewater flows of 75 gpcd.

Residential Water Demand Projections

The population projections presented in Table 1 were multiplied by the 88 gpcd LOS to obtain the water demand projections for Babcock Ranch in gpd. The potable water demands were then converted from gpd to gallons per minute (gpm) and multiplied by a peaking factor of 3.0 (established in the *Babcock Ranch Community Water and Wastewater Systems, Preliminary Design Report*, March 2008, CDM) to obtain the peak hour demand projections in gpm. The average day demand projections and peak hour demands projections are presented in **Table 2** for each phase of the Babcock Ranch Development.

Table 2
Residential Water Demand Projections

Phase I (2013 - 2018)				
Community	Total Population	Average Day Demands (gpd)	Average Day Demands (gpm)	Peak Hour Demands (gpm)
Village Center	271	23,880	17	50
Village III	3,149	277,094	192	577
Town Center	5,486	482,775	335	1,006
Hamlet I	1,777	156,344	109	326
Totals	**10,683**	**940,093**	**653**	**1,959**
Phase II (2019 - 2023)				
Community	Total Population	Average Day Demands (gpd)	Average Day Demands (gpm)	Peak Hour Demands (gpm)
Village Center	5,606	493,363	343	1,028
Village III	1,203	105,882	74	221
Town Center	4,675	411,361	286	857
Hamlet I	1,682	148,009	103	308
Hamlet II	2,273	200,049	139	417
Totals	**15,439**	**1,358,664**	**944**	**2,831**
Phase III (2024 - 2028)				
Community	Total Population	Average Day Demands (gpd)	Average Day Demands (gpm)	Peak Hour Demands (gpm)
Village Center	2,924	257,270	179	536
Village IV	719	63,304	44	132
Town Center	5,284	464,978	323	969

Table 2
Residential Water Demand Projections – Continued:

Hamlet II	1,795	157,921	110	329
Hamlet III	2,081	183,153	127	382
Hamlet IV	471	41,452	29	86
Hamlet V	118	10,363	7	22
Totals	**13,391**	**1,178,440**	**818**	**2,455**
Phase IV (2029 - 2033)				
Community	Total Population	Average Day Demands (gpd)	Average Day Demands (gpm)	Peak Hour Demands (gpm)
Village Center	456	40,100	28	84
Village IV	3,617	318,321	221	663
Town Center	2,657	233,841	162	487
Hamlet III	1,039	91,464	64	191
Hamlet IV	945	83,128	58	173
Hamlet V	980	86,282	60	180
Totals	**9,695**	**853,135**	**592**	**1,777**
Grand Totals	**49,208**	**4,330,332**	**3,007**	**9,022**

Wastewater Flow Projections

The population projections presented in Table 1 were multiplied by the 74 gpcd LOS to obtain the average day wastewater flow projections for Babcock Ranch in gpd. To calculate the peak hourly wastewater flows, the average day flow projections were multiplied by a peaking factor which was calculated using the following Ten State Standards formula:

$$\text{Peak Factor for wastewater} = \frac{(18 + (\text{population}/1000)^{1/2})}{(4 + (\text{population}/1000)^{1/2})}$$

Using this formula, as the population increases the peaking factors decrease. For the peaking factor calculation for each phase of construction, the total population for the previous phase was added to the formula in addition to the new population in each community for the phase being evaluated. Using this methodology, peaking factors range from a high of 4.1 to a low of 2.35. Peak hour factors utilized in the previous documents reviewed during the development of this memo indicated peaking factors ranging from a high of 4.0 to a low of 2.5. For consistency with previous methodologies, this same range of peaking factors will be applied to this memo such that calculated results falling above 4.0 will be indicated as 4.0 and calculated results falling below 2.5 will be indicated as 2.5. The average day and peak hour wastewater flow projections and calculated peaking factors are presented in **Table 3** for each phase of the Babcock Ranch Development.

Table 3
Residential Wastewater Flow Projections Using Charlotte County LOS

Phase I (2013 - 2018)					
Community	Total Population	Average Day Flows (gpd)	Average Day Flows (gpm)	Calculated Peaking Factors	Peak Hour Flows (gpm)
Village Center	271	20,081	14	4.00	56
Village III	3,149	233,011	162	3.42	554
Town Center	5,486	405,970	282	3.21	904
Hamlet I	1,777	131,471	91	3.63	331
Totals	**10,683**	**790,533**	**549**		**1,845**
Phase II (2019 - 2023)					
Community	Total Population	Average Day Flows (gpd)	Average Day Flows (gpm)	Calculated Peaking Factors	Peak Hour Flows (gpm)
Village Center	5,606	414,874	288	2.74	790
Village III	1,203	89,037	62	2.88	178
Town Center	4,675	345,917	240	2.77	665
Hamlet I	1,682	124,462	86	2.86	247
Hamlet II	2,273	168,223	117	2.84	332
Totals	**15,439**	**1,142,513**	**793**		**2,212**
Phase III (2024 - 2028)					
Community	Total Population	Average Day Flows (gpd)	Average Day Flows (gpm)	Calculated Peaking Factors	Peak Hour Flows (gpm)
Village Center	2,924	216,340	150	2.50	376
Village IV	719	53,233	37	2.52	93
Town Center	5,284	391,004	272	2.50	679
Hamlet II	1,795	132,797	92	2.51	231
Hamlet III	2,081	154,015	107	2.50	268
Hamlet IV	471	34,857	24	2.53	61
Hamlet V	118	8,714	6	2.53	15
Totals	**13,391**	**990,961**	**688**		**1,723**
Phase IV (2029 - 2033)					
Community	Total Population	Average Day Flows (gpd)	Average Day Flows (gpm)	Calculated Peaking Factors	Peak Hour Flows (gpm)
Village Center	456	33,720	23	2.50	70
Village IV	3,617	267,679	186	2.50	558
Town Center	2,657	196,639	137	2.50	410
Hamlet III	1,039	76,913	53	2.50	160
Hamlet IV	945	69,903	49	2.50	146
Hamlet V	980	72,556	50	2.50	151
Totals	**9,695**	**717,409**	**498**		**1,495**
Grand Totals	**49,208**	**3,641,416**	**2,529**		**7,276**

Previous methodologies assumed a 90 percent return rate of potable water demands to calculate wastewater flow projections. To provide a comparison to results shown in Table 3, the wastewater flow projections were also calculated using a 90 percent return with the calculated peaking factors. This methodology resulted in a slight increase (more conservative estimate) in the projected wastewater flows of 6.57 percent. The results of this evaluation are presented in **Table 4**.

Table 4
Residential Wastewater Flow Projections Using 90 Percent Potable Water Demand Return Rate

Phase I (2013 - 2018)					
Community	Average Day Potable Water Demands (gpd)	Average Day Flows (gpd)	Average Day Flows (gpm)	Calculated Peaking Factor	Peak Hour Flows (gpm)
Village Center	23,880	21,492	15	4.00	60
Village III	277,094	249,385	173	3.42	593
Town Center	482,775	434,498	302	3.21	968
Hamlet I	156,344	140,710	98	3.63	354
Totals	**940,093**	**846,084**	**588**		**1,975**
Phase II (2019 - 2023)					
Community	Average Day Potable Water Demands (gpd)	Average Day Flows (gpd)	Average Day Flows (gpm)	Calculated Peaking Factor	Peak Hour Flows (gpm)
Village Center	493,363	444,027	308	2.74	846
Village III	105,882	95,293	66	2.88	191
Town Center	411,361	370,225	257	2.77	712
Hamlet I	148,009	133,208	93	2.86	265
Hamlet II	200,049	180,044	125	2.84	355
Totals	**1,358,664**	**1,222,797**	**849**		**2,368**
Phase III (2024 - 2028)					
Community	Average Day Potable Water Demands (gpd)	Average Day Flows (gpd)	Average Day Flows (gpm)	Calculated Peaking Factor	Peak Hour Flows (gpm)
Village Center	257,270	231,543	161	2.50	402
Village IV	63,304	56,973	40	2.52	100
Town Center	464,978	418,480	291	2.50	727
Hamlet II	157,921	142,129	99	2.51	248
Hamlet III	183,153	164,837	114	2.50	287
Hamlet IV	41,452	37,306	26	2.53	66
Hamlet V	10,363	9,327	6	2.53	16
Totals	**1,178,440**	**1,060,596**	**737**		**1,844**

Phase IV (2029 - 2033)					
Community	Average Day Potable Water Demands (gpd)	Average Day Flows (gpd)	Average Day Flows (gpm)	Calculated Peaking Factor	Peak Hour Flows (gpm)
Village Center	40,100	36,090	25	2.50	75
Village IV	318,321	286,489	199	2.50	597
Town Center	233,841	210,457	146	2.50	438
Hamlet III	91,464	82,317	57	2.50	171
Hamlet IV	83,128	74,815	52	2.50	156
Hamlet V	86,282	77,654	54	2.50	162
Totals	**853,135**	**767,822**	**533**		**1,600**
Grand Totals	**4,330,332**	**3,897,299**	**2,706**		**7,787**

Commercial Water Demand and Wastewater Flow Projections

Because the Development of Regional Impact Application provided greater detail for the proposed commercial developments than the updated absorption schedule, this data was utilized to predict the commercial water demands and wastewater flow projections.

Table 5 presents the projected usage rates for the various types of planned commercial developments for potable water demands and wastewater flows. Usage rates for wastewater flows were calculated as 90 percent of the potable water usage. The projected commercial developments by phase are presented in **Table 6**.

Table 5
Commercial Development Projected Usage Rates

Type of Development	Projected Water Usage	Projected Wastewater Flows (90% of Water Usage)	Units
Retail	0.2	0.18	gpd/ft^2
Office	0.2	0.18	gpd/ft^2
Medical Office	0.2	0.18	gpd/ft^2
Industrial	0.2	0.18	gpd/ft^2
Golf Course Facilities	500	450	gpd/hole
Hotel	0.42	0.378	gpd/ft^2
School	22	19.8	gpd/student
Religious Facilities	0.2	0.18	gpd/ft^2
Parks	200	180	gpd/acre
Hospital	250	225	gpd/bed
Assisted Living	200	180	gpd/unit
Civic	0.2	0.18	gpd/ft^2

Table 6
Proposed Commercial Developments by Phase

Type of Development	Phase 1	Phase 2	Phase 3	Phase 4
Retail (ft^2)	344,640	413,640	2,050,623	117,040
Office (ft^2)	146,160	231,700	996,880	25,260
Medical Office (ft^2)	-	200,000	300,000	-
Industrial (ft^2)	50,000	150,000	464,057	-
Golf Course Facilities (holes)	-	36	18	-
Hotel (ft^2)	60,000	210,000	90,000	-
School (students)	1,036	1,551	1,502	964
Religious Facilities (ft^2)	10,000	50,000	45,000	15,000
Parks (acres)	80	115	70	35
Hospital (beds)	-	177	-	-
Assisted Living (units)	-	418	-	-
Civic (ft^2)	80,000	30,000	30,000	10,000

Using data presented in Tables 5 and 6, the average potable water demands in gpd and peak hour demands in gpm, using a peaking factor of 3.0, were calculated. These results are presented in **Table 7**. Assuming a 90 percent return rate of the water demands, the wastewater flow projections were calculated using a conservative peaking factor of 4.0. Projected commercial wastewater flows are presented in **Table 8**.

Table 7
Commercial Potable Water Demands

Type of Development	Commercial Potable Water Demands (gpd)				
	Phase 1	Phase 2	Phase 3	Phase 4	Totals
Retail (ft^2)	68,928	82,728	410,125	23,408	**585,189**
Office (ft^2)	29,232	46,340	199,376	5,052	**280,000**
Medical Office (ft^2)	-	40,000	60,000	-	**100,000**
Industrial (ft^2)	10,000	30,000	92,811	-	**132,811**
Golf Course Facilities (holes)	-	18,000	9,000	-	**27,000**

Table 7
Commercial Potable Water Demands - Continued:

Type of Development	Commercial Potable Water Demands (gpd)				
	Phase 1	**Phase 2**	**Phase 3**	**Phase 4**	**Totals**
Hotel (ft^2)	25,200	88,200	37,800	-	**151,200**
School (students)	22,792	34,122	33,044	21,208	**111,166**
Religious Facilities (ft^2)	2,000	10,000	9,000	3,000	**24,000**
Parks (acres)	16,000	23,000	14,000	7,000	**60,000**
Hospital (beds)	-	44,250	-	-	**44,250**
Assisted Living (units)	-	83,600	-	-	**83,600**
Civic (ft^2)	16,000	6,000	6,000	2,000	**30,000**
Totals	**190,152**	**506,240**	**871,156**	**61,668**	**1,629,216**

Type of Development	Commercial Peak Hour Potable Water Demands (gpm)				
	Phase 1	**Phase 2**	**Phase 3**	**Phase 4**	**Totals**
Retail (ft^2)	144	172	854	49	**1,219**
Office (ft^2)	61	97	415	11	**583**
Medical Office (ft^2)	-	83	125	-	**208**
Industrial (ft^2)	21	63	193	-	**277**
Golf Course Facilities (holes)	-	38	19	-	**56**
Hotel (ft^2)	53	184	79	-	**315**
School (students)	47	71	69	44	**232**
Religious Facilities (ft^2)	4	21	19	6	**50**
Parks (acres)	33	48	29	15	**125**
Hospital (beds)	-	92	-	-	**92**
Assisted Living (units)	-	174	-	-	**174**
Civic (ft^2)	33	13	13	4	**63**
Totals	**396**	**1,055**	**1,815**	**128**	**3,394**

Table 8
Commercial Wastewater Flows Using 90 Percent Water Demand Return Rate

Type of Development	Commercial Wastewater Flows (gpd)				
	Phase 1	Phase 2	Phase 3	Phase 4	Totals
Retail (ft^2)	62,035	74,455	369,112	21,067	**526,670**
Office (ft^2)	26,309	41,706	179,438	4,547	**252,000**
Medical Office (ft^2)	-	36,000	54,000	-	**90,000**
Industrial (ft^2)	9,000	27,000	83,530	-	**119,530**
Golf Course Facilities (holes)	-	16,200	8,100	-	**24,300**
Hotel (ft^2)	22,680	79,380	34,020	-	**136,080**
School (students)	20,513	30,710	29,740	19,087	**100,049**
Religious Facilities (ft^2)	1,800	9,000	8,100	2,700	**21,600**
Parks (acres)	14,400	20,700	12,600	6,300	**54,000**
Hospital (beds)	-	39,825	-	-	**39,825**
Assisted Living (units)	-	75,240	-	-	**75,240**
Civic (ft^2)	14,400	5,400	5,400	1,800	**27,000**
Totals	**171,137**	**455,616**	**784,040**	**55,501**	**1,466,294**

Type of Development	Commercial Peak Hour Wastewater Flows (gpm)				
	Phase 1	Phase 2	Phase 3	Phase 4	Totals
Retail (ft^2)	172	207	1,025	59	**1,463**
Office (ft^2)	73	116	498	13	**700**
Medical Office (ft^2)	-	100	150	-	**250**
Industrial (ft^2)	25	75	232	-	**332**
Golf Course Facilities (holes)	-	45	23	-	**68**
Hotel (ft^2)	63	221	95	-	**378**
School (students)	57	85	83	53	**278**

Table 8
Commercial Wastewater Flows Using 90 Percent Water Demand Return Rate – Continued:

Type of Development	Commercial Peak Wastewater Flows (gpm)				
	Phase 1	Phase 2	Phase 3	Phase 4	Totals
Religious Facilities (ft^2)	5	25	23	8	**60**
Parks (acres)	40	58	35	18	**150**
Hospital (beds)	-	111	-	-	**111**
Type of Development	**Commercial Peak Hour Wastewater Flows (gpm)**				
	Phase 1	**Phase 2**	**Phase 3**	**Phase 4**	**Totals**
Assisted Living (units)	-	209	-	-	**209**
Civic (ft^2)	40	15	15	5	**75**
Totals	**475**	**1,266**	**2,178**	**154**	**4,073**

Summary

Population projections and the percentages of contribution from the various planned communities by phase were updated using the 2010 absorption schedule. Based on the population updates, Charlotte County LOS, a residential occupancy rate of 2.56 persons per ERU, and a peaking factor of 3.0, the residential water demand projections were calculated. The residential wastewater flow projections were also updated based on population updates, Charlotte County LOS, a residential occupancy rate of 2.56 persons per ERU, and calculated peaking factors. Prior reports evaluated during the development of this memo estimated wastewater flows by assuming a 90 percent return of the potable water demands. Wastewater flow projections were also calculated using the 90 percent return method and produced similar results to those obtained using the Charlotte County LOS and the residential occupancy rate of 2.56 persons per ERU. Because the results were similar but slightly more conservative, the residential wastewater demands presented in the summary table, **Table 9**, are based on the 90 percent return evaluation.

Commercial water demands were calculated based on commercial usage rates for potable water, and the types of commercial planned commercial developments. This information was obtained from the Development of Regional Impact Application. Typical usage rates were not available for commercial wastewater flow projection so these flows were calculated assuming a 90 percent return of the projected potable water demands.

Table 9
Summary of Residential and Commercial Water Demands and Wastewater Flows

Demands	Phase 1	Phase 2	Phase 3	Phase 4	Totals
Residential Water Demands (gpd)	940,093	1,358,664	1,178,440	853,135	**4,330,332**
Commercial Water Demands (gpd)	190,152	506,240	871,156	61,668	**1,629,216**
Residential Peak Hour Water Demands (gpm)	1,959	2,831	2,455	1,777	**9,022**
Commercial Peak Hour Water Demands (gpm)	396	1,055	1,815	128	**3,394**
Residential Wastewater Flows (gpd)	846,084	1,222,797	1,060,596	767,822	**3,897,299**
Commercial Wastewater Flows (gpd)	171,137	455,616	784,040	55,501	**1,466,294**
Residential Peak Hour Wastewater Flows (gpm)	1,975	2,368	1,844	1,600	**7,787**
Commercial Peak Hour Wastewater Flows (gpm)	475	1,266	2,178	154	**4,073**

Figure 1
Conceptual Master Plan for Babcock Ranch Community