SCHEDULE 3

SCHEDULE 3 OF THE LEASE CONSISTS OF THE FOLLOWING SCHEDULES:

1) Schedule 3.1-A - "Best Management Practices Plan for Total Phosphorous and Total Nitrogen" (this is applicable to the Premises, and also includes Schedule 3.1-B [as Exhibit D], which is applicable if the Option Property is acquired pursuant to the Option).

2) Schedule 3.2-A - "Best Management Practices Plan Sugar Cane Production" (applicable to the Premises).*

3) Schedule 3.2-B – "Best Management Practices Plan Sugar Production" (applicable if the Option Property is acquired pursuant to the Option).*

4) Schedule 3.3 – "Best Management Practices Plan Citrus" (applicable to the Premises).+

* This is applicable to Sugar Lease only.

\+ This is applicable to Citrus Lease only.

SCHEDULE 3.1-A

BEST MANAGEMENT PRACTICES PLAN FOR TOTAL PHOSPHORUS AND TOTAL NITROGEN

South Florida Water Management District
3301 Gun Club Road
West Palm Beach, Florida 33406

May 11, 2009

BEST MANAGEMENT PRACTICES PLAN FOR TOTAL PHOSPHORUS AND TOTAL NITROGEN

The South Florida Water Management District (SFWMD) and United States Sugar Corporation SBG Farms Inc., and Southern Gardens Grove Corporation (collectively "USSC") have entered into an Amended & Restated Agreement for Sale & Purchase dated May 2009 pursuant to which the District will acquire approximately 73,000 acres of farmland owned by USSC with an option to buy the remaining approximate 107,000 acres of farmland at a future date. With regard to the approximately 73,000 acres of farmland, the District will lease that land (referred to in this Schedule as "farming units" or "purchased lands") to USSC subject to the terms of the Amended & Restated Agreement for Sale & Purchase dated May 2009 and the related Lease Agreement dated May 2009. In the event that the SFWMD exercises the option and subsequently acquires the remaining USSC lands, this schedule (**Schedule 3.1-A**) becomes null and void and **Exhibit D Schedule 3.1-B** applies to all of the USSC acres then being leased from the SFWMD.

As set forth below, and in addition to the requirements set forth in the Best Management Practices Plan for Sugar Cane Production and Vegetable Farming (Schedule 3.2) and Best Management Practices (BMP) Plan for Citrus (Schedule 3.3), USSC as lessee shall implement source controls for reducing total phosphorus (TP) in discharges for all land uses and shall monitor flow volume and nutrient concentrations at discharge points from the property as identified in Exhibit A and as detailed in a District-approved Discharge Monitoring Plan and BMP Plan. In addition to currently monitored discharge points from purchased lands, this schedule identifies locations of new monitored locations in **Exhibit A** that will be considered in the District approved plan. Consistent with the Everglades Forever Act, "Best management practice" or "BMP" means a practice or combination of practices determined by the District, in cooperation with the Florida Department of Environmental Protection, based on research, field-testing, and expert review, to be the most effective and practicable, including economic and technological considerations, on-farm means of improving water quality in agricultural discharges to a level that balances water quality improvements and agricultural productivity.

The lessee shall obtain a permit from the District, or agree to the modification of existing permits, in accordance with Chapter 40E-63, F.A.C., and/or Chapter 40E-61, F.A.C., as applicable, to implement an approved BMP Plan and Discharge Monitoring Plan. The BMP Plan shall consider the BMPs and equivalent points ("points") as defined by Section 1.4 of the Best Management Practices Plan for Sugar Cane Production and Vegetable Farming (Schedule 3.2) and Best Management Practices Plan for Citrus (Schedule 3.3), as set forth below.

Attached as **Exhibit B Tables 1, 2, and 3** are the long-term historical FWMCs and UALs, target loads and concentrations, initial BMP point requirements, and other data for the purchased lands. If any inconsistencies exist between the language in **Exhibit B** and **Schedule 3.1-A** regarding performance measures, compliance methods, monitoring, initial BMP point requirements, or any other data contained in **Exhibit B Tables 1, 2, and 3**, then **Exhibit B** shall prevail.

(1) BMP PLANS AND PERMITS

(a) BMP Point Requirements

1. EAA Farms -- All farming units within the EAA that have long-term historical 3-year flow weighted mean concentration (FWMC) or unit area loads (UALs) that exceed a 200 ppb total phosphorus concentration or 1.2 pounds per acre phosphorus unit area load will also implement

BMP Plans with 35 points. All other farming units in the EAA that have long-term historical 3-year FWMC or UALs that are below 200 ppb and 1.2 pounds per acre (lbs/acre) will continue to maintain those historical levels in accordance with the Statistical Performance Assessment Method and continue to implement BMP Plans with 25 points. Farming units, their long-term historical FWMCs and UALs, and BMP point requirements are identified in Exhibit B.

2. Farms outside of the EAA -- Farming units in areas outside the EAA will implement BMP Plans with 35 points. Existing BMP plans already undergoing implementation in accordance with other statutory authorizations for agricultural non-point source control efforts, such as BMP plans authorized by the Florida Department of Agriculture and Consumer Services under a Notice of Intent ("NOI"), shall be evaluated for the equivalency points associated with a 35 point BMP plan. If a 35 point equivalency is evident, then a 35 point BMP plan will be considered as already implemented under this agreement.

(b) Requirements for BMP Plans, Permits, and Water Quality Monitoring -- BMP Plans will be required to have adequate water management, nutrient management, and sediment and erosion control BMPs. For those areas that fall inside the jurisdictional boundaries of Chapter 40E-61 and where a General Permit was previously granted by rule or formal District action, it will be necessary for the lessee to obtain an Individual Permit meeting the BMP and discharge requirements of this Schedule. For those areas outside the jurisdictional boundaries of Chapter 40E-63 and 40E-61, F.A.C., the lessee shall follow the same permitting process described under Chapter 40E-63, F.A.C., to obtain a staff report/permit that will become the exhibit to an executed consent agreement between the lessee and the District including a BMP Plan with 35 points (as defined above) and a Discharge Monitoring Plan contemplated by this Schedule. In cases where the lessee is a co-permittee with others, a separate permit may be used to approve the lessee's BMP and Discharge Monitoring Plans. Permit applications shall be submitted within 30 days of closing to obtain approval of BMP Plans, Discharge Monitoring Plans, and USSC Demonstration Project Scopes of Work.

1. For Basin IDs not already subject to BMP plans approved by the District, in order to begin BMP implementation immediately, the BMP Plan shall be implemented within 90 days after written approval by the District and the Discharge Monitoring Plan shall be implemented no more than 180 days from the closing of the purchase and sale agreement (regardless of whether a final permit or consent agreement has been issued). A proposed BMP and Discharge Monitoring Plan requires justification and must receive District approval for any timeframe that will take longer than these timelines to implement.

2. Regardless of the type of permit/approval obtained for the BMP Plan and Discharge Monitoring Plan (40E-63 WOD, 40E-61 WOD, consent agreement), the lessee shall monitor daily during discharge for total phosphorus in surface water discharges from the Basin ID at District-approved monitoring points and in accordance with monitoring requirements described in Chapter 40E-63, F.A.C., in order to obtain flow-weighted mean concentrations and calibrated flow measurements. Total nitrogen (TN) shall be monitored only if a TN numeric criterion or TMDL is adopted, or a TN limitation is made part of a NPDES permit requirement with respect to the following regions: the EAA, Water Conservation Areas, Lake Okeechobee or the Caloosahatchee River. Such monitoring shall be restricted to the Basin ID(s) that discharge to the applicable area. Data shall be reported to the District in electronic format within the time frame prescribed in the permit/approval issued by the District. The District will evaluate the data on an annual water year basis as set forth below.

3. USSC will have the right to install its own internal monitoring within a sub-basin and substitute this data in place of the sub-basin monitoring for the purpose of evaluating water quality in accordance with this Schedule.

(2) WATER QUALITY PERFORMANCE ASSESSMENTS

The intent of the parties is to assure that there is no degradation of performance in the Basin IDs that have historically performed below 200 ppb phosphorus and 1.2 lbs/acre, and to achieve a net improvement in those Basin IDs not achieving 200 ppb and 1.2 lbs/ac. The parties recognize that variability exists in discharge data and have developed a statistical methodology to be used in this section as a tool in evaluating the Basin ID performance. It is recognized that this methodology is not a prediction tool but rather a tool to be used as an initial indicator of Basin ID performance and to be used in conjunction with additional evaluation. By virtue of the statistics utilized, the method will indicate excursions (e.g., false positives) which may or may not be actual indications of degradation, and, as a result, additional evaluation is appropriate to determine if a Basin ID is truly showing adverse performance or whether the results are due to other reasonable factors outside the control of the Lessee, including but not limited to hurricane effects, droughts, high phosphorus concentrations in Lake Okeechobee irrigation water, and other factors observed in other regional performance. Exhibit C shows an example of how the tool can indicate excursions when in fact an evaluation of reasonable factors may show adverse performance in years due to these factors.

(a) Establishing Performance Measures -- Establishing the performance measures for USSC farms was based on historical water quality levels determined from either farm level monitoring data (if available), or in the absence of farm level data, the monitoring data from the sub-basin in which the USSC Basin IDs are located. The available farm level monitoring data are representative of the discharges from a "Basin ID" which is a hydrological discharge unit identified in a BMP permit issued under Rule 40E-63 (F.A.C.).

1. For each USSC Basin ID or sub-basin (when applicable), an average value was established for both a 3-year moving flow-weighted mean TP concentration (FWMC) and 3-year moving average Unit Area Load (UAL) based on a ten year historical (long-term) period of record (**see Exhibit B, Table 1**). Based on these averages, performance measures were established for each "Basin ID" or sub-basin depending on whether the averages were below or above 200 ppb or 1.2 lbs/acre. The performance measure was therefore set based on the following criteria:

    a. a flow-weighted mean TP concentration of 200 ppb, or the historical average 3-yr flow weighted mean discharge TP concentration, determined from the 10-year period of historical record, if lower and

    b. a Unit Area Load (UAL) of 1.2 pounds/acre, or the historical average 3-yr moving average UAL determined from the 10-year period of historical record, if lower.

2. Farms (within Basin IDs or sub-basins) that historically show achievement of levels lower than 200 ppb and 1.2 pounds per acre, shall maintain the historical flow weighted mean concentrations and unit area loads (see **Exhibit B, Table 1**) as performance measures in order to prevent water quality "backsliding".

3. For USSC farms within sub-basins not having Basin IDs, those farms will be grouped into Basin IDs (to be assigned) and the monitoring data representative of those Basin IDs will be aggregated for consistency to facilitate a comparison with the performance measures that were established based on sub-basin water quality levels.

4. An annual performance assessment will be conducted for each Water Year (May 1st – April 30th) and will consist of:

a. Calculating a 3-yr moving average TP flow-weighted mean concentration (FWMC) and 3-yr moving average TP UAL for each year based on the current water year and previous two water years of observed data. The 3-yr moving average TP FWMC will be calculated as the sum total of the TP load (kilograms) divided by the sum total Flow (acre-feet) for the Water Year assessment period, and multiplied by a conversion factor to obtain a flow-weighted mean TP concentration for the overall three Water Year period. The 3-yr moving average TP UAL will be calculated as the average of the three Water Years during the assessment period.

b. Applying a statistical assessment method (described in Section 2.b) to determine if performance measures are being achieved.

(b) Statistical Performance Measure Assessment Method -- In order to assess progress with meeting performance measures, the assessment methodology in this section is grouped into two categories based on whether the Basin ID performance measure is to: 1) maintain historical water quality levels (FWMC and UAL) for Basin IDs historically below 200 ppb and 1.2 lb/acre, or 2) achieve progress toward meeting the performance measures of 200 ppb and 1.2 lbs/ acres for those Basin IDs that were historically above these levels. For Basin IDs required to maintain their historical levels, a variability component is incorporated into the assessment method. For those Basin IDs that have historical water quality levels above 200 ppb or 1.2 lbs/acre, a "Net Improvement" methodology is incorporated into the assessment method. The methodology is set forth as follows and is explicitly described in the spreadsheet included in the electronic file attached as **Exhibit C**, which includes a description of historical variability.

1. ***Establishing Variability Factors*** – *For Basin IDs with Historical Water Quality* ***Below*** *the 200 ppb and 1.2 lbs/acre Performance Measures.*

a. TP Limits for both TP Concentration and UAL were established for each Basin ID or sub-basin based on the natural variability exhibited by Basin ID discharges. Limits were calculated at the 90% confidence level using the following equation and are presented in **Table 1 (Exhibit B)**:

$$L_{90\%} = m + s\, t_{90\%,df}$$

where, $L_{90\%}$ = annual limit at the 90% confidence level
m = average 3-yr cumulative flow-weighted mean TP concentration (and UAL) during the 10-yr period of record
s = standard deviation of the average 3-yr cumulative flow-weighted mean TP concentration (and UAL) during the 10-yr period of record
$t_{90\%,df}$ = 1-tailed t statistic at 90% confidence level and with df degrees of freedom
$df = N - 1$
N = number of 3-yr average values

b. An overall excursion frequency was determined based on a comparison of each Basin ID or sub-basin to the criteria below. Applying the below criteria to the ten year historical record of 3-year moving averages of all Basin IDs or sub-basins in this category yielded an overall excursion frequency due to normal variability of 17%. Excursion frequency is defined as the total number of excursions divided by the total number of USSC Basin IDs and sub-basins; if any one or more of the criteria below is not met for a Basin ID or an

aggregated basin (in case additional basin IDs are created within one existing sub-basin), it is considered a single excursion.

i. At least one in three successive years the 3-yr moving average TP concentration shall to be at or below the 3-yr Target concentration (identified in **Table 1, Exhibit B**).
ii. At least one in three successive years the 3-yr moving average TP UAL shall to be at or below the 3-yr Target UAL (identified in **Table 1, Exhibit B**).
iii. The 3-yr moving average TP concentration shall be at or below the TP Limit concentration (identified in **Table 1, Exhibit B**).
iv. The 3-yr moving average UAL shall be at or below the TP Limit UAL (identified in **Table 1, Exhibit B**).

2. ***Establishing "Net Improvement" Factors*** – *For Basin IDs with Historical Water Quality* ***Above*** *the 200 ppb or 1.2 lbs/acre Performance Measures.*

a. The performance measure for those Basin IDs with historical TP discharges above the 200 ppb or 1.2 lbs/acre thresholds is to achieve these performance measures or otherwise demonstrate a meaningful net improvement in TP performance. In some Basin ID cases, achieving these performances measures (200 ppb and 1.2 lbs/acre) may require very little in the way of reductions (i.e. going from an average historical level of 225 ppb to an average target of 200 ppb). In other Basin ID cases, the reductions would need to be much greater (i.e. going from an average historical level of 386 ppb to an average target of 200 ppb). Therefore, it would be expected that discharges from some Basin IDs will be reduced sufficiently to achieve the 200 ppb and 1.2 lb/acre performance measures, while others discharges may not.

b. At the present time, there is no guidance for establishing with certainty a quantitative TP performance measure associated with increasing the BMPs from 25 points to 35 points, an increase of 40%. Hence, for the purpose of establishing a meaningful net improvement performance measure, it is necessary to make an assumption, and it was therefore assumed that the 40% increase in BMP points will potentially achieve a 20% performance improvement over the period of three years. By limiting the assumed performance improvement (20%) to one-half of the relative BMP point increase (i.e. 40%), this assumption acknowledges the diminishing returns associated with BMP water quality improvements.

c. In some of these Basin IDs, the historical TP concentration was below the 200 ppb threshold, indicating the UAL is the parameter that needs to be reduced towards the 1.2 pounds per acre threshold. In other Basin IDs, the historical UAL was below the 1.2 pounds per acre threshold, and for those Basin IDs it was the TP concentration that needs to be reduced towards the 200 ppb threshold. A summary of the more restrictive TP parameter, and the estimate of a "*20% Performance Improvement*" is identified in **Table 2 of Exhibit B**. In recognition of the uncertainty in the expected performance and variability, a deviation of 50% (the "*Upper Performance Limit*") of the TP improvement from historical levels will be applied during the annual assessment.

(c) Annual Performance Assessment -- For the water year ending April 30, the District will perform an annual assessment of the TP discharges from each USSC Basin ID based on observed monitoring data submitted by USSC. In cases where new Basin IDs are assigned within sub-basins, the observed monitoring data for the Basin IDs within each sub-basin will be aggregated for evaluation. If the aggregate result shows that performance measures are not being met, an evaluation of each Basin ID

will be conducted to ascertain if additional water quality improvement activities will be necessary on all Basin IDs within the sub-basin or for a particular individual Basin ID only. The following describes the assessment steps for Basin IDs required to either maintain historical water quality (for those Basin IDs below 200 ppb and 1.2 lbs/acre) with a variability component, or achieve a "Net Improvement" (for those Basin IDs above 200 ppb or 1.2 lbs/acre).

1. ***All Basin IDs*** -- An annual assessment will be conducted for each Basin ID for each water year (May 1st – April 30th). The 3-yr moving average TP flow-weighted mean concentration and 3-yr moving average TP unit area loading (UAL) will be calculated each year for each Basin ID or sub-basin as applicable.

2. ***Basin IDs with Historical Water Quality -- <u>Below</u> the 200 ppb and 1.2 lbs/acre Performance Measures (see Figure 1 in Exhibit B for flow chart of this process)***

   a. Of the total USSC Basin IDs and sub-basins, the overall excursion frequency will be calculated each water year for each Basin ID based on the criteria outlined in Section 2.b. To maintain consistency in calculating the overall excursion rate, new Basin IDs assigned within sub-basins will be treated (through aggregation of the observed monitoring data) as one area.

   b. If the overall excursion frequency is greater than 17%, then each Basin ID that contributed to the overall excursion will be deemed to not achieve their performance measures, unless the USSC submits an Assessment Report identifying valid Basin ID-specific factors outside USSC control (described in Section 2.e) that contributed to the higher than expected excursion frequency.

   c. If the overall excursion frequency is less than or equal to 17%, the excursion frequency expected due to normal variability, then all USSC Basin IDs will be deemed to have achieved the performance measures, with the exception of Basin IDs determined by the District to have excessive TP levels as described below.

   d. Regardless of the results of the excursion frequency assessment, discharges from individual Basin IDs will be assessed for excessive TP levels each water year. The 95% Confidence Limits in **Tables 1 and 2 (Exhibit B)** reflect an upper bound above the TP Targets, as defined by the variability exhibited in the 10-yr calibration period. If an individual Basin ID discharge exceeds the 95% confidence limit TP concentration or UAL, then the Basin ID will be deemed to not achieve their performance measure, unless the USSC submits an Assessment Report identifying valid Basin ID-specific factors outside USSC control (described in Section 2.e) that contributed to the excessive TP levels. Assessment Report requirements are outlined in Section 2.d.

   e. The annual performance assessment will not be conducted in water years when rainfall in the sub-basin, where the farming units are located, exceeds the maximum annual sub-basin rainfall or is below the minimum that occurred during the 10-yr calibration period (see **Table 3, Exhibit B**). If a year is excluded based upon this criterion, results from adjacent years will be treated as consecutive in assessing performance.

3. ***Basin IDs with Historical Water Quality -- <u>Above</u> the 200 ppb or 1.2 lbs/acre Performance Measures (see Figure 2 in Exhibit B for flow chart of this process).***

a. Only one TP parameter will be assessed against the net improvement performance measure, as identified in **Table 2 of Exhibit B**. In recognition of the uncertainty in the expected performance and variability, a deviation of 50% of the TP improvement from historical levels will be applied, and this is referred to as the "*Upper Performance Limit*".

b. If the calculated 3-yr moving TP value is above the limit of the respective performance measure, the Basin ID will be deemed to not achieve its "Net Improvement" performance measure, unless the USSC submits an Assessment Report identifying valid Basin ID-specific factors outside USSC control (described in Section 2.e) that contributed to the levels of TP in the discharge.

c. The annual performance assessment will not be conducted in water years when rainfall in the sub-basin, where the farming units are located, exceeds the maximum annual sub-basin rainfall or is less than the minimum annual sub-basin rainfall that occurred during the 10-yr calibration period (see **Table 3, Exhibit B**). If a year is excluded based upon this criterion, results from adjacent years will be treated as consecutive in assessing performance.

d. Once a Basin ID achieves the "*20% Performance Improvement*" measure in **Table 2 of Exhibit B**, that Basin ID will be assessed in future years based on the new performance measure in accordance with Section 2.c.2 above. The limit would be established in accordance with Section 2.b.1. with the additional need to re-scale the historical data to the "20% Performance Improvement" as the new long-term performance measure.

4. ***Annual Performance Assessment Timelines.***

a. By May 1 of each year, the District will provide a preliminary draft status of the current Water Year's TP performance assessment for each Basin ID.

b. By August 1 of each year, the District will provide a status report of the previous Water Year's TP performance assessment for each Basin ID.

(d) USSC Assessment Report Requirements -- the Assessment Report submitted by USSC will be subject to the following:

1. The USSC Assessment Report shall be submitted by November 1. Within 30 days of receipt of the Assessment Report, the District will notify USSC of the final determination of their findings.

2. If the District determines that the USSC Assessment Report reasonably explains why the USSC discharges did not achieve the performance measures set forth above, then no additional water quality improvement activities will be required for that Water Year.

3. If the District determines that the USSC Assessment Report does not reasonably explain why the USSC discharges did not achieve the performance measures set forth above, then USSC will submit a permit application to modify the existing BMP implementation plan to either increase the BMPs to 35 points, optimize an existing 35 point plan, or implement a USSC demonstration project, as applicable. All of these are to be permitted and implemented by April 30 (the end of the Water Year in which the USSC Assessment Report is submitted as conditioned in Section 2.d.1).

4. The Assessment Report may include evaluation of data, factors and analysis of the Maximum Performance Achievable as defined below, and shall be considered by the District in the determination of whether or not the performance measures have been achieved.

(e) Factors Outside USSC Control -- In the event that discharges from USSC Basin IDs do not achieve the performance measures as defined above, USSC will prepare and transmit an Assessment Report identifying valid factors outside USSC control as described below. The Assessment Report shall identify Basin IDs that contributed to not achieving the specified performance measures. The District will determine if the factors identified in the Assessment Report are valid. If the District determines that the Assessment Report provides valid justification, the District shall exclude the Basin ID from being required to implement additional water quality improvement activities for that Water Year. Examples of factors include, but are not limited to, those identified below:

1. ***Extreme Hydrologic Events.*** The presence of extreme hydrological (e.g. hurricanes or droughts) events may be identified by USSC in their Assessment Report. The multi-year (i.e., residual) effects of these extreme events may be cited as a specific factor influencing performance.

2. ***Above or Below Average Rainfall.*** The potential for the unit area load (UAL) of a Basin ID to be influenced by above average or below average rainfall may be evaluated by the Lessee as a factor for not achieving the UAL or the concentration targets and may be identified by USSC in their Assessment Report.

3. ***Rainfall Runoff Relationship.*** The potential for the UAL of a Basin ID or concentration to be explained by the sub-basin rainfall/TP load relationship or other regional relationship may be evaluated by the Lessee as a factor for not achieving the UAL or concentration and may be identified by USSC in their Assessment Report.

4. ***Emergency Conditions.*** Discharges will be allowed in accordance with the emergency provisions of Chapter 373, F.S.

5. ***High Lake Stages.*** For the Ch 298 Districts, L-8 and S-4 sub-basins, additional seepage may be induced by high stages of Lake Okeechobee. Recognizing this factor, Lake Okeechobee stage can be compared to the maximum annual average stage that occurred during the 10-yr calibration period (SFWMD DBKEY 15611; **Table 3, Exhibit B**). For the Ch. 298 Districts, the 10-yr period covered WY1999-2008, with an observed maximum annual average stage of 15.6 ft NGVD. For the L-8 sub-basin, the 10-yr period covered WY1996-2005, with an observed maximum annual average stage of 16.3 ft NGVD. For the S-4 sub-basins, the 10-yr period covered WY1998-2007, with an observed maximum annual average stage of 15.7 ft NGVD.

6. ***TP Concentration of Lake Okeechobee Deliveries.*** Basin ID discharges may be influenced by TP concentrations in Lake Okeechobee deliveries used for irrigation. The Assessment Report may provide an evaluation showing that a correlation exists between irrigation water quality data (for each Basin ID not meeting the performance measure for consideration) and Lake Okeechobee releases such that the releases are a contributing factor influencing Basin ID performance.

7. ***Random & Historical Variation.*** The Lessee may report any statistical uncertainty in the methodology using acceptable scientific methods In recognition of the statistical uncertainty associated with the derivation of the TP Limits, the Lessee will evaluate the potential for

statistical, data measurement or other error including the cumulative Type I errors, the effect of rounding the UAL to two decimal places, historical Joint Exceedance Frequencies for Basin IDs as identified in Tables 2 and 3, and the historical exceedance frequencies for individual 3-year averages that ranged from 9% to 41%. Random variation may also include sampling and analyses variations.

8. ***Other Factors.*** Unavoidable legal barriers or restraints, including those arising from actions or regulations not under the control of USSC.

(f) A Basin ID will be required to implement additional water quality improvement activities subject to the requirements of this Schedule if the District determines, after consideration of USSC's Assessment Report, that established performance measures are not being achieved in accordance with the annual performance assessment method described above.

(3) IMPLEMENTION OF WQ IMPROVEMENT ACTIVITIES

It is the intent of this section and Section 4 to describe the process of implementing water quality improvement activities if the performance measures identified in **Exhibit B** are not achieved. Most of the USSC farms have existing BMPs in place. The Parties recognize that there is uncertainty as to the effectiveness of additional BMPs, and that there are diminishing returns on implementing additional BMPs. Many factors contribute to this uncertainty, including TP cycling in the aquatic systems, TP transport issues, inherent background TP levels, Lake Okeechobee concentrations and loads and human interaction effects that might obscure or negate the effects towards achieving further farm level TP load reductions. Through additional on-farm studies, demonstration projects and development programs, at some point in the future the Parties may find that additional BMP implementation is not technically or economically feasible. This point is referred to as the Maximum Performance Achievable (MPA).

Existing data demonstrate that BMPs in the EAA are capable of sustaining a basin-wide long-term average reduction in TP loads of 50%, and that at some point in the future, further efforts towards increasing the reduction may not be technically or economically feasible. BMP research and applications recognize that the majority of the reductions in TP loading at the farm level are due to changes in water management schemes that reduce volumes and concentrations of water actively pumped off-farm in rainfall events, sediment controls or fertilizer controls.

For the purpose of this document, new or additional water quality improvement activities refers to BMP implementation or other nutrient reduction activities that are not already occurring on the property pursuant to a pre-existing BMP plan or permit. Nothing herein prohibits a change in BMPs already implemented provided sufficient justification is submitted to and approved by the SFWMD (e.g. an existing BMP is in conflict with an optimization BMP as it is demonstrated to be ineffective or cost prohibitive). For Basin IDs required to implement new or additional water quality improvement activities (new BMP Plan, BMP optimization plan or participation in a USSC Demonstration Project), or establish new or additional monitoring, evaluation for achievement of performance measures will occur in the year following the third full Water Year after the District-established deadline for implementation of the approved BMP Plan and Discharge Monitoring Plan, and annually thereafter, as set forth in applicable permit or consent agreement. (Stated differently, whenever a new water quality improvement BMP plan is required as a result of not achieving the Performance Measures, the third annual performance assessment following the implementation deadline[1] will be used for the next performance assessment.) This will allow for a 3-year response time prior to any future implementation of additional water quality

[1] The District may grant an extension of the implementation deadline due to factors outside the control of USSC.

improvement activities. Annual evaluations for achievement of performance measures will begin immediately for those Basin IDs that are already required to implement the appropriate BMP levels and monitoring requirements.

In the event Performance Measures are not maintained or achieved 3 full water years after implementation, the Lessee shall implement the following remedial measures. For Basin IDs implementing BMP Plans with only 25 BMP points, the BMP Plan and permit shall be modified to include a total of 35 BMP points and implemented in accordance with the procedures and timelines set forth above. For Basin IDs that do not achieve the performance measures and already have permits to implement BMP Plans with 35 BMP points, the Lessee shall work cooperatively with the District to develop a BMP Optimization and Water Quality Improvement Plan, discussed below, that optimizes the BMP plan in order to achieve the performance measures. Additional BMP points or water quality improvement plans shall be approved by the District and incorporated into the applicable permit/consent agreement and shall comply with the requirements described below.

A Basin ID must meet the Performance Measures as described above regardless of the status of the EAA basin-level or farm-level compliance under Chapter 40E-63, or other compliance requirements under Chapter 40E-61. On lands with more stringent nutrient reduction and monitoring requirements than under this Schedule, the more stringent requirements, related to the existing permitted BMP plan, discharge monitoring plan, and compliance requirements, shall apply (e.g., C-139 Annex ERP, previous Consent Agreements). All BMP Plans are also incorporated by reference into the Lease Agreement between the District and lessee.

(4) BMP OPTIMIZATION AND WATER QUALITY IMPROVEMENT PLANS

If, despite the implementation of a BMP Plan based on 35 BMP points, a Basin ID does not meet the Performance Measures defined in **Exhibit B**, the Lessee shall implement a District-approved BMP optimization plan or a District-approved USSC Demonstration Project, as described below. The Lessee shall submit to the District a permit application for either the BMP optimization plan or the USSC Demonstration Project in accordance with the schedule in Section 2(d). Full implementation of a District approved BMP optimization plan and/or USSC Demonstration Project shall be completed by the deadline established in the approved plan.

(a) BMP Optimization Plans -- Optimization and water quality improvement plans shall be based on Basin ID specific site assessments of existing site conditions (e.g., soils, crops, etc.), operation techniques, farming activities, and BMPs. Proposed optimization plans shall include consideration of two sediment controls and one water management BMP. The purchase of partial Basin IDs shall also be considered in determining the efficacy or necessity of a BMP Optimization Plan. Indicated below are examples of BMP optimization activities; items 1, 2, and 3 must be considered in the lessee's proposal. If these are not possible to implement, other activities may be proposed as long as it is demonstrated that they are optimization activities resulting in new or improved BMP implementation activities. The activities are not limited to those listed below. These examples were developed based on findings by the UF-IFAS in BMP technical datasheets and the Final Report on Everglades Agricultural Area BMPs for Reducing Particulate Phosphorus Transport (June 2005) to the FDEP. If the lessee proposes other optimization efforts, they must be substantiated by technical information such as District demonstration project and UF/IFAS research results or other scientifically defensible data that is mutually agreed to by the parties. All optimization efforts will require detailed documentation for verification of implementation.

1. Install weed retention booms in the main canal at an optimal distance from the main discharge structure to ensure water quality benefits in discharges. UF/IFAS literature suggests

greater than 300 m (984 ft) upstream of the main pump stations; however, this distance may be modified based on site specific conditions.

2. Mechanically remove accumulated floating aquatic vegetation, initially every six months until a site-specific schedule is established for optimal water quality results. Removed vegetation shall be placed away from any canals or ditches in a manner and at a location that will prevent reintroduction to the canals. The extent or distance of the vegetation removal activities from the main discharge structure shall be determined based on site specific conditions. There must be a technical basis to demonstrate the proposed distance is optimal for water quality improvements at the discharge structure. Schedule removal of aquatic vegetation when no immediate need for pumping is expected because physical removal will cause dislodging of detritus from the roots.

3. Determine the lowest pump velocity that meets the farm specific water management needs in addition to optimizing canal velocities targeted at minimizing transport of sediments downstream through the discharge structure during normal operation. Establish the associated canal water levels, cross sectional dimensions, and/or pump speeds to maintain that velocity and for record keeping purposes.

4. Use 5-foot vegetated buffers and berms along all ditches. Native grass or other unfertilized grasses (e.g. Bahia) should be used.

5. Measure canal sediment accumulation in the canal and sump upstream of the discharge structure, every six months initially until a site-specific schedule is established for optimal water quality results from localized canal cleaning. Determine the maximum sediment accumulation that is permissible to prevent sediment transport during pumping events based on established canal velocities. Based on these results, establish a sediment canal cleaning schedule more stringent than the historical schedule. All cleaning should take place prior to the rainy season (March) when pumping will be more frequent, and prior to the growing and hurricane season (August), when lower canal levels may need to be attained. If canal levels are lowered to facilitate canal cleaning, there shall be no off site discharges. If lowering water levels in a canal prior to sediment removal is necessary, use internal/portable pumps or gravity drainage to direct this water to fallow farms.

6. Do not pump offsite during or immediately after sediment removal is complete. Wait 24 hours or until turbidity levels return to normal conditions.

7. Start and stop pump controls must be set at elevations to prevent pump cycling and suspension of sediments. Extend pump period cycling to a minimum of eight hours or provide the basis for the optimal settings, if different.

8. Provide water management such that there is no direct discharge of rice and fallow-flooded field drainage. Retain or use for internal irrigation.
9. For vegetable crops, improve irrigation practices using soil moisture measurements to determine irrigation needs (amount and timing).
10. Optimization of vegetable nutrient application rates and control application methods (mulched beds).

(b) USSC Demonstration Projects -- For Basin IDs not achieving Performance Measures, USSC may conduct a District-approved demonstration project evaluating the efficacy of a BMP optimization project described above. The project scope will be approved by permit modification, which shall include an independent technical review.

(c) Maximum Performance Achievable -- If after BMP optimization or demonstration projects have been completed to a level such that the District finds that no further optimization activities are feasible, a Basin ID continues to not achieve the Performance Measures, the Basin ID shall be evaluated to determine if it has optimized to the maximum extent practicable for the review period based on the latest technical information available. The District will determine the MPA for a Basin ID based on data provided by USSC, IFAS or obtained through District Demonstration and Research Projects. The MPA for a Basin ID shall also consider the magnitude of the water quality benefits (in discharges from the Basin ID as well as at the STA outflow) associated with any additional activities and the diminishing returns for those efforts. The MPA is Basin ID specific and is dependent on the current levels of P in discharges as well as other factors in the Basin ID. The MPA will be based on BMP implementation and other site specific variables, and that reductions beyond this point may be cost prohibitive or technically infeasible. The MPA is based on the latest technical information available for the review period. All of the activities contributing to the MPA shall continue to be implemented unless permit modifications are approved. In the future, if additional water quality improvement measures become feasible, then an MPA can be revised.

(5) DISTRICT DEMONSTRATION AND RESEARCH PROJECTS

The Lessee shall allow the District access to all leased farms in order to conduct research, related projects, and associated monitoring designed to improve the efficacy of agricultural BMPs. The District will provide written notice and a copy of the project scope at least 120 days prior to initiation of the project.

USSC will contribute in-kind services over the period of the lease, not to exceed a value of $1.2 million, to facilitate the USSC Demonstration Project and the District's demonstration and research projects. The USSC in-kind services shall be calculated in accordance with the most recent cost guidelines (see http://www.economics.nrcs.usda.gov/cost/nrcscost.html) published by the United States Department of Agriculture - Natural Resources Conservation Service (USDA-NRCS), and USSC shall submit an annual report summarizing its in-kind services. The in-kind services shall include, but not be limited to:

- Assigning a USSC point of contact for demonstration projects to be responsible for the logistics and scheduling of associated activities on the farm, notifying the District of any field constraints or deviations, providing technical insight, participating in meetings, reviewing project documents, and coordinating with the District or its contractors.
- Providing man-hours and equipment to perform on-farm labor, including but not limited to, activities such as canal vegetation and sediment removal, earthwork, land preparation, planting and harvesting of crops in research plots, soil and water sample collection.
- Laboratory services to process and analyze any soil samples resulting from the analysis.
- Scientists and engineers to assist with project design, results review, and interpretation.
- Pump operation, pump operator time, flow measurement equipment, and associated expenses (e.g., fuel, maintenance) during field tests (e.g., to test slow pump velocities and effect on phosphorus loading).
- Maintaining canal management levels at the elevations required by the field tests.
- Set up and operation of water quality autosamplers for shorter composite periods than those allowed by permits.
- Installation and operation of additional water quality autosamplers at locations internal to the farm.
- Providing all project water quality and flow data from these monitoring sites to the District at a frequency described in the scope.

- The costs of collection, processing, and reporting for the laboratory analyses including those at greater frequencies as described by the project scope.
- Recording data on field logs as described by the scope of the project.
- Providing farms and labor for aquatic vegetation disposal or incorporation into soils.
- Removing vegetation to allow access to project sites (e.g., to discharge points from surface water impoundments).
- Seeding and maintenance of vegetation on berms and buffers.
- Cleaning of ditches and sumps at the frequencies required by the demonstration project.
- Making operational modifications to facilitate testing of recirculation and retention or drain down waters from fallow flooded or rice fields (e.g., via operation of weirs and risers and portable pumps).

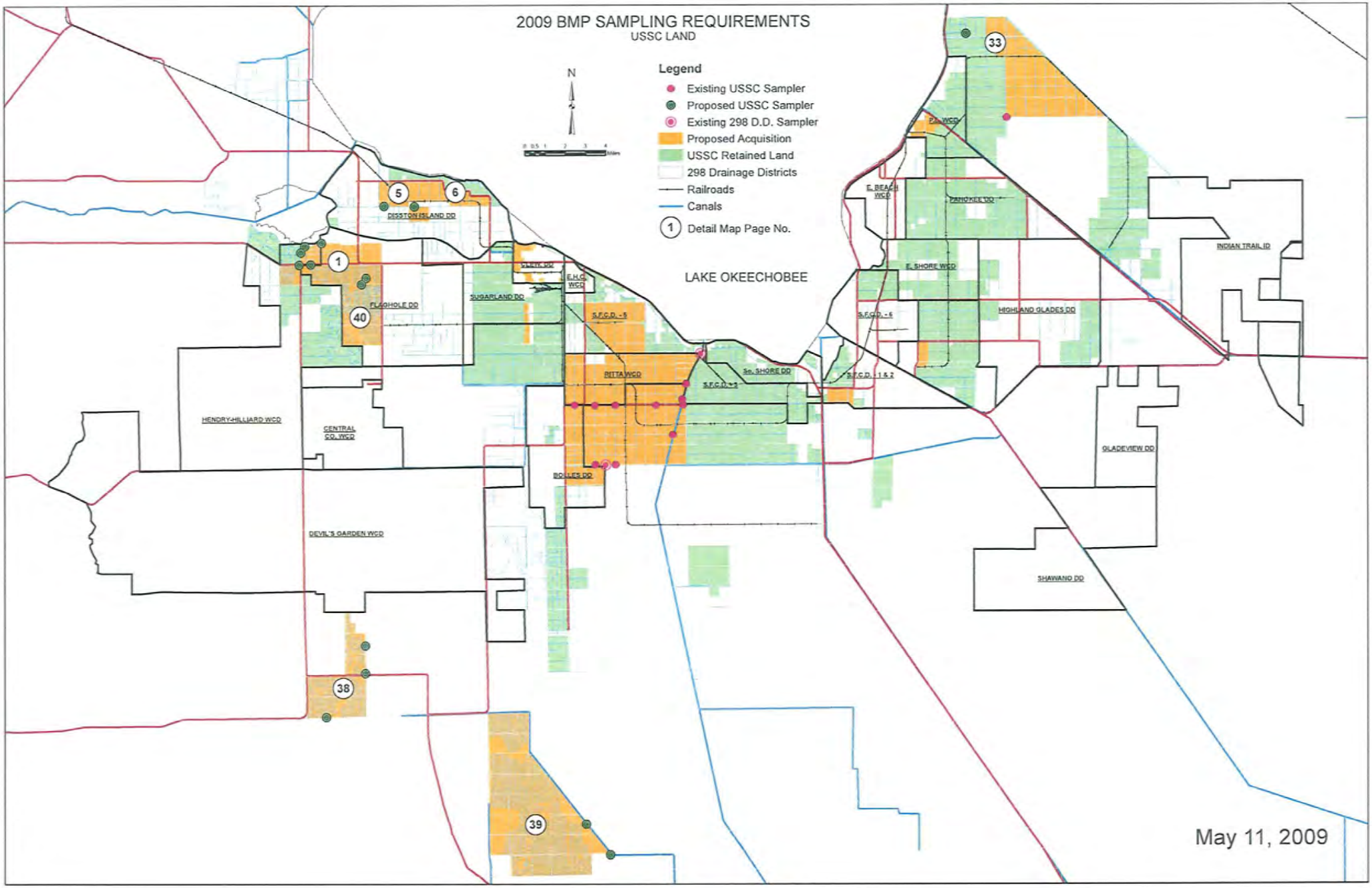
(6) DISPUTE RESOLUTION PROCESS

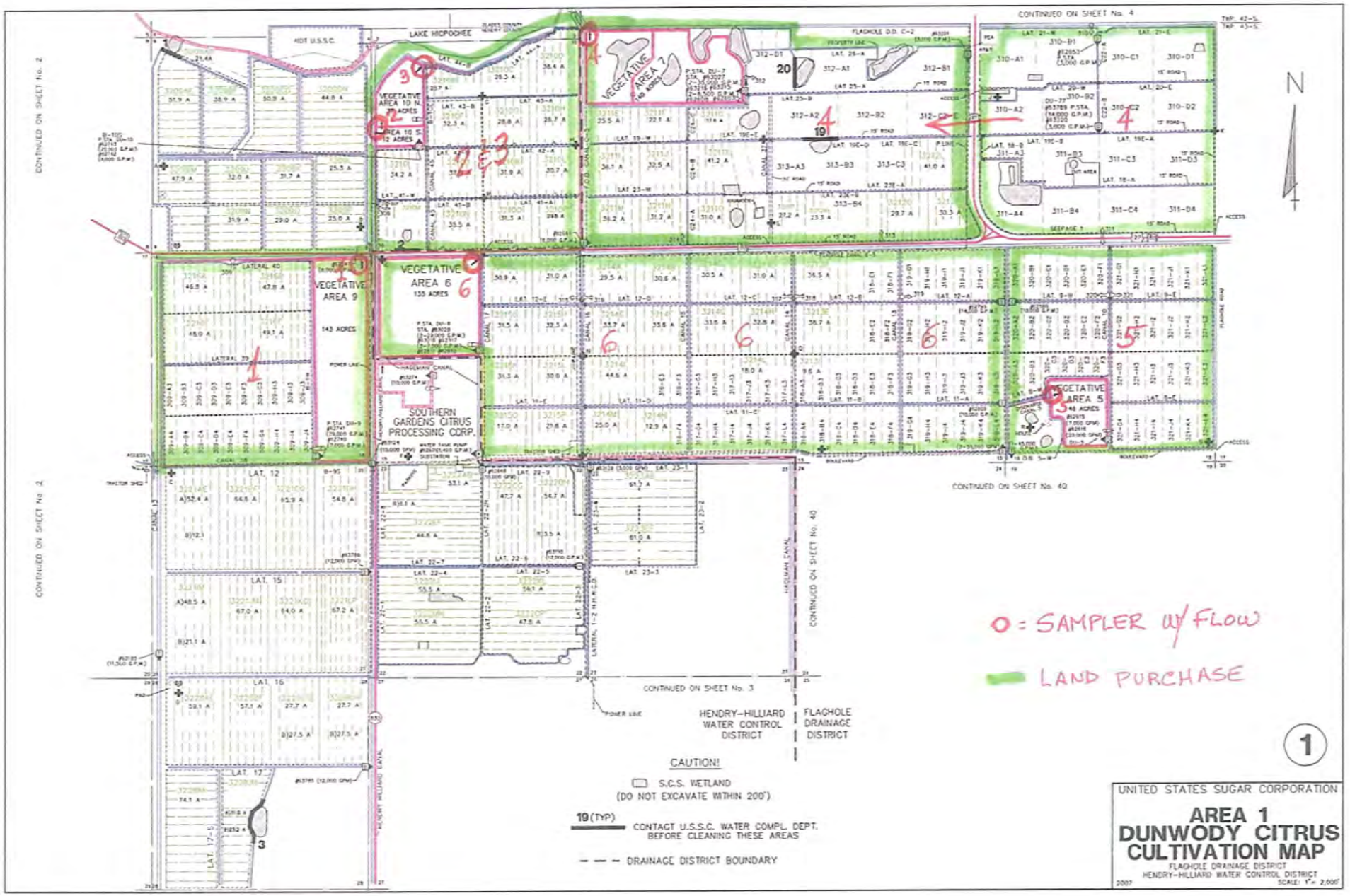
Disputes regarding compliance with Schedule 3.1 shall be governed by Section 7 of the Lease.

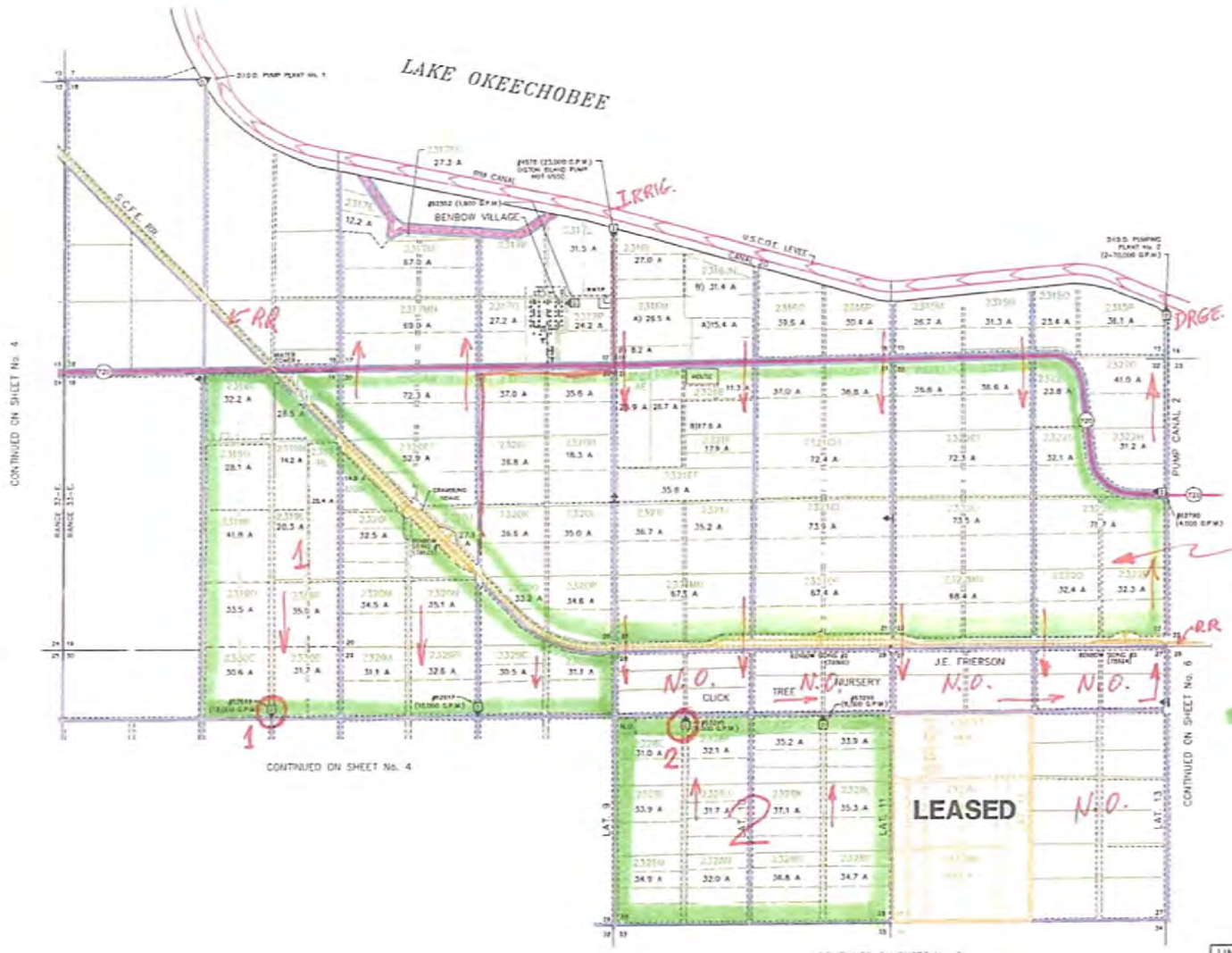
(7) AGREEMENT BY THE LESSEE AND THE DISTRICT

This schedule 3.1-A is a negotiated BMP plan as part of the Amended & Restated Agreement for Sale and Purchase dated May 2009 between the parties. By entering into such agreement the lessee does not necessarily agree that the additional BMPs will result in reductions in STA discharge, enhanced STA performance or that additional BMPs will enhance on-farm performance. Furthermore, if the purchase and sale transaction is not consummated for any reason this BMP plan becomes null and void and the lessee does not give up any right to negotiate a different BMP approach in the future nor to give up the right to contest any proposed BMPs or BMP compliance methodology in any administrative hearing or court of law.

EXHIBIT A TO SCHEDULE 3.1-A


2009 BMP SAMPLING REQUIREMENTS
USSC LAND
N
Legend
Existing USSC Sampler
Proposed USSC Sampler
Existing 298 D.D. Sampler
Proposed Acquisition
USSC Retained Land
298 Drainage Districts
Railroads
Canals
1 Detail Map Page No.
LAKE OKEECHOBEE
DISSTON ISLAND DD
FLAGHOLE DD
SUGARLAND DD
E.H.C. WCD
S.F.C.D. - 5
S.F.C.D. - 6
S.F.C.D. 1 & 2
So. SHORE DD
RITTA WCD
BOLLES DD
HENDRY-HILLIARD WCD
CENTRAL CO. WCD
DEVIL'S GARDEN WCD
E. BEACH WCD
E. SHORE WCD
HIGHLAND GLADES DD
INDIAN TRAIL ID
GLADEVIEW DD
SHAWANO DD
May 11, 2009


CONTINUED ON SHEET No. 4
CONTINUED ON SHEET No. 2
CONTINUED ON SHEET No. 40
CONTINUED ON SHEET No. 3
CONTINUED ON SHEET No. 40
LAKE HICPOCHEE
HOT U.S.S.C.
VEGETATIVE AREA 10 N. 27 ACRES
VEGETATIVE AREA 10 S. 12 ACRES
VEGETATIVE AREA 7 148 ACRES
VEGETATIVE AREA 9 143 ACRES
VEGETATIVE AREA 6 135 ACRES
VEGETATIVE AREA 5 48 ACRES
SOUTHERN GARDENS CITRUS PROCESSING CORP.
HENDRY-HILLIARD WATER CONTROL DISTRICT
FLAGHOLE DRAINAGE DISTRICT
HENDRY-HILLIARD CANAL
FLAGHOLE CANAL
LATERAL 40
LATERAL 39
LATERAL 1-2 (H.H.W.C.D.)
POWER LINE
TRACTOR SHED
PAD
ACCESS
LAT. 12
LAT. 15
LAT. 16
LAT. 17
LAT. 17-S
N
O = SAMPLER w/ FLOW
LAND PURCHASE
CAUTION!
S.C.S. WETLAND
(DO NOT EXCAVATE WITHIN 200')
19 (TYP)
CONTACT U.S.S.C. WATER COMPL. DEPT. BEFORE CLEANING THESE AREAS
DRAINAGE DISTRICT BOUNDARY
1
UNITED STATES SUGAR CORPORATION
AREA 1
DUNWODY CITRUS CULTIVATION MAP
FLAGHOLE DRAINAGE DISTRICT
HENDRY-HILLIARD WATER CONTROL DISTRICT
2007
SCALE: 1" = 2,000'



N

5

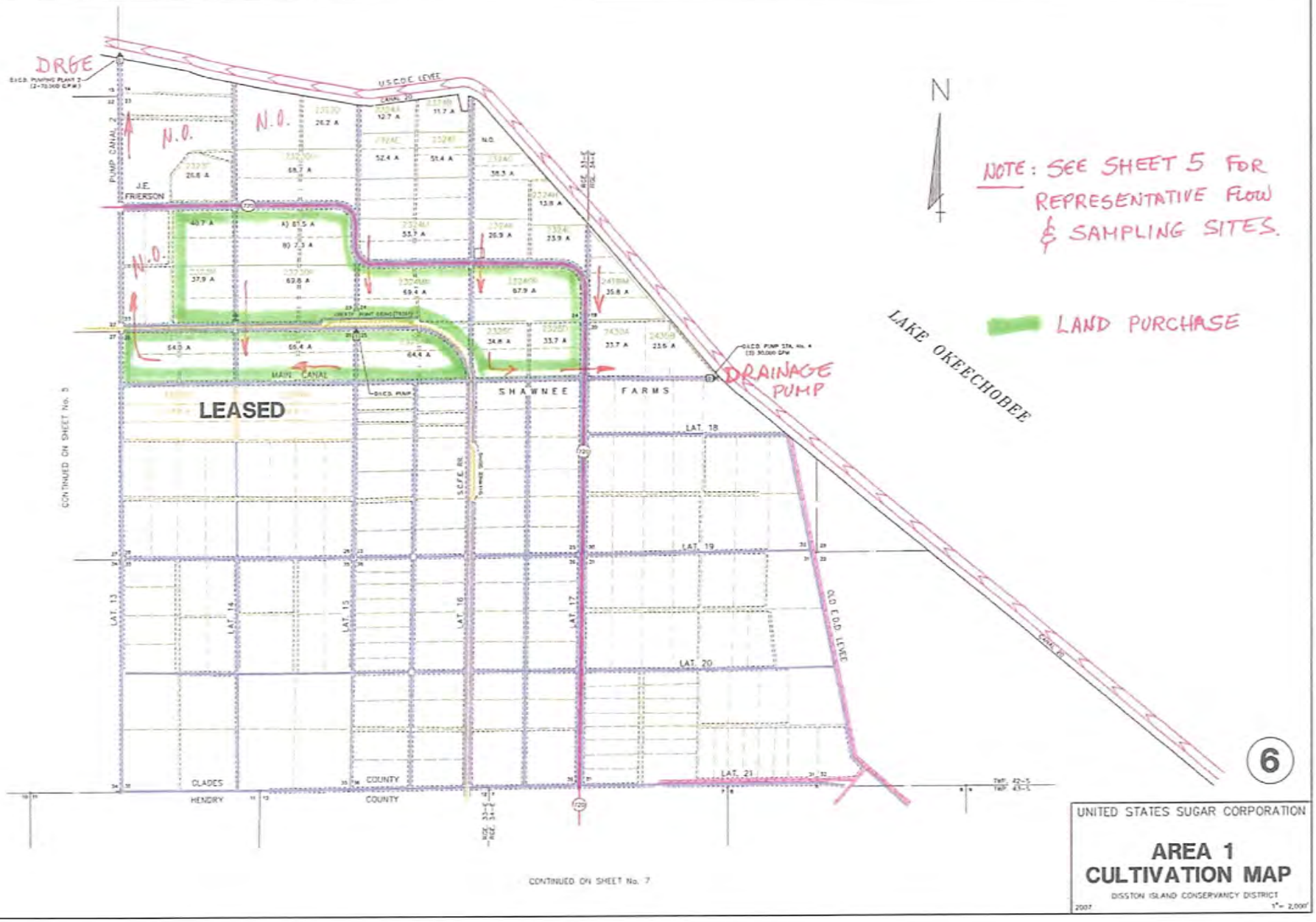
UNITED STATES SUGAR CORPORATION

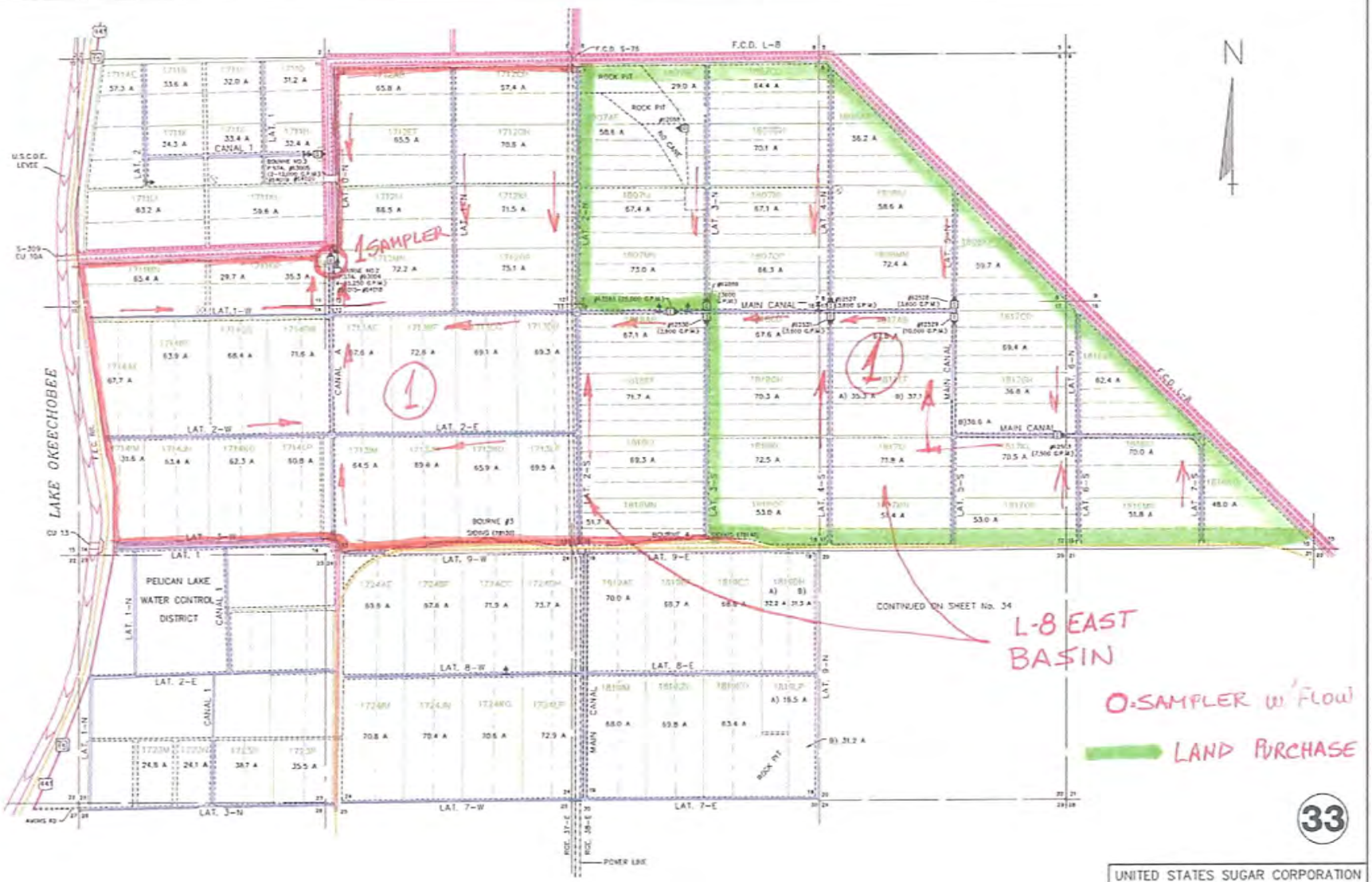
AREA 1 CULTIVATION MAP

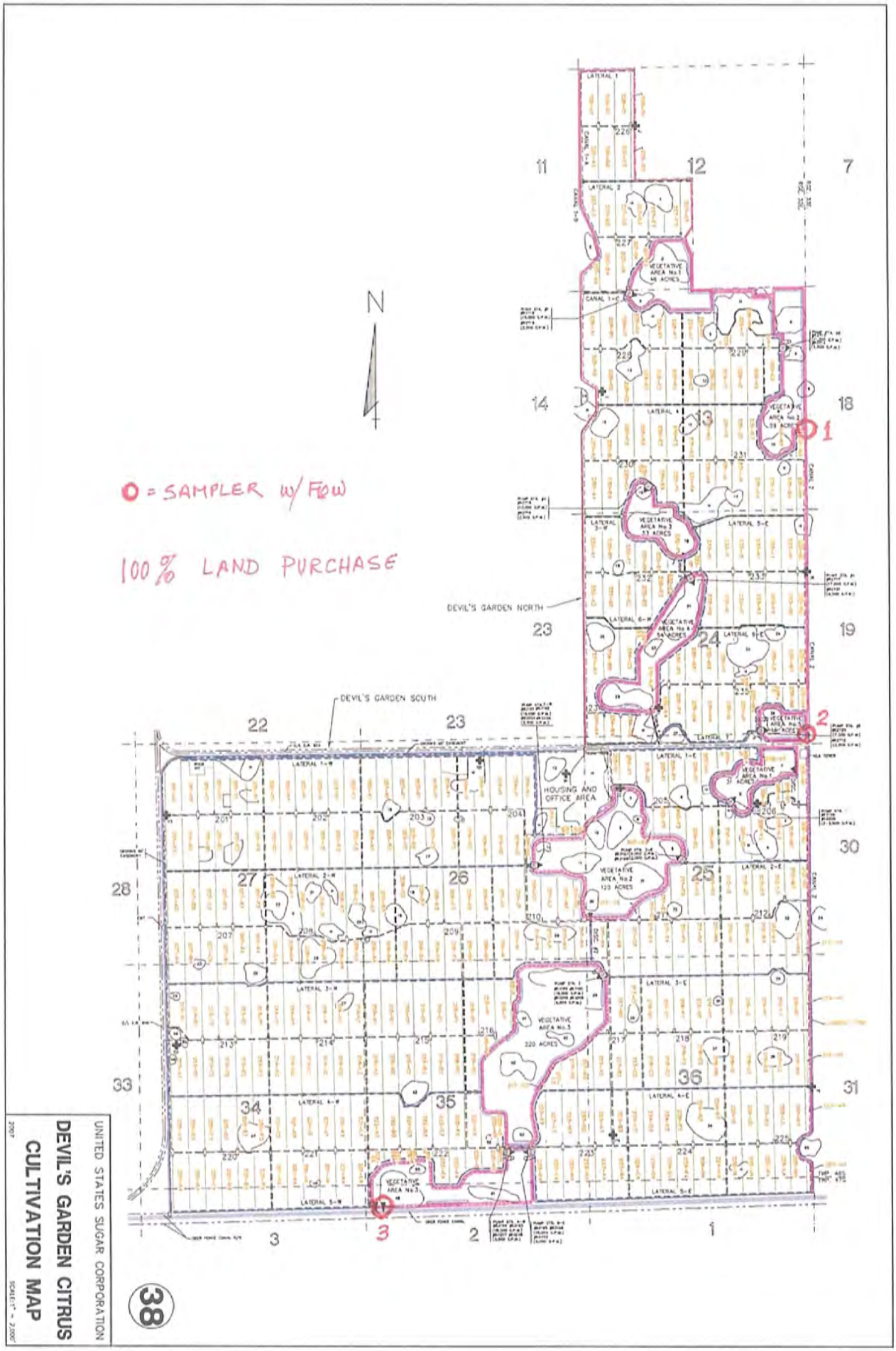
DISSTON ISLAND CONSERVANCY DISTRICT

2007

SCALE: 1" = 2,000'


DRGE
U.S.C.O.E. LEVEE
N.O.
N.O.
N.O.
J.E. FRIERSON
PUMP CANAL 2
LEASED
MAIN CANAL
SHAWNEE FARMS
DRAINAGE PUMP
LAKE OKEECHOBEE
NOTE: SEE SHEET 5 FOR REPRESENTATIVE FLOW & SAMPLING SITES.
LAND PURCHASE
N
LAT. 18
LAT. 19
LAT. 20
LAT. 21
LAT. 13
LAT. 14
LAT. 15
LAT. 16
LAT. 17
S.F.E. RR
O.D. E.O.D. LEVEE
CLADES
HENDRY
COUNTY
COUNTY
CONTINUED ON SHEET No. 5
CONTINUED ON SHEET No. 7
6
UNITED STATES SUGAR CORPORATION
AREA 1
CULTIVATION MAP
DISSTON ISLAND CONSERVANCY DISTRICT
2007
1"= 2,000'


N
F.C.D. L-8
F.C.D. S-79
U.S.C.O.E. LEVEE
LAKE OKEECHOBEE
S-309
CU 10A
CU 13
1 SAMPLER
MAIN CANAL
CANAL 1
PELICAN LAKE WATER CONTROL DISTRICT
CANAL 1
BOURNE #3
ROCK PIT
CONTINUED ON SHEET No. 34
CONTINUED ON SHEET No. 32
POWER LINE
L-8 EAST BASIN
O-SAMPLER W/ FLOW
LAND PURCHASE
33
UNITED STATES SUGAR CORPORATION
AREA 4
CULTIVATION MAP
2007
SCALE: 1" = 2,000'



UNITED STATES SUGAR CORPORATION

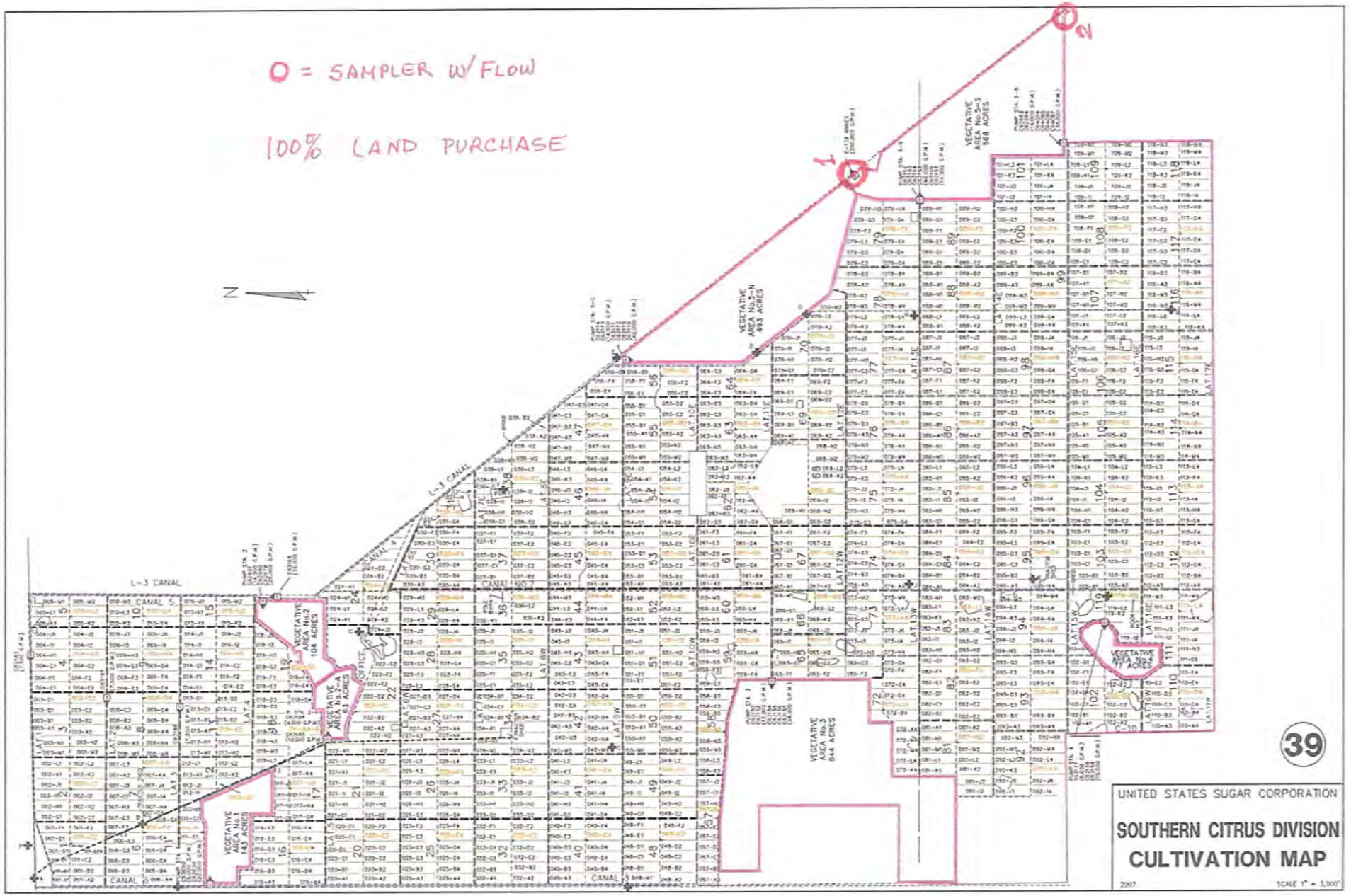
DEVIL'S GARDEN CITRUS

CULTIVATION MAP

2007

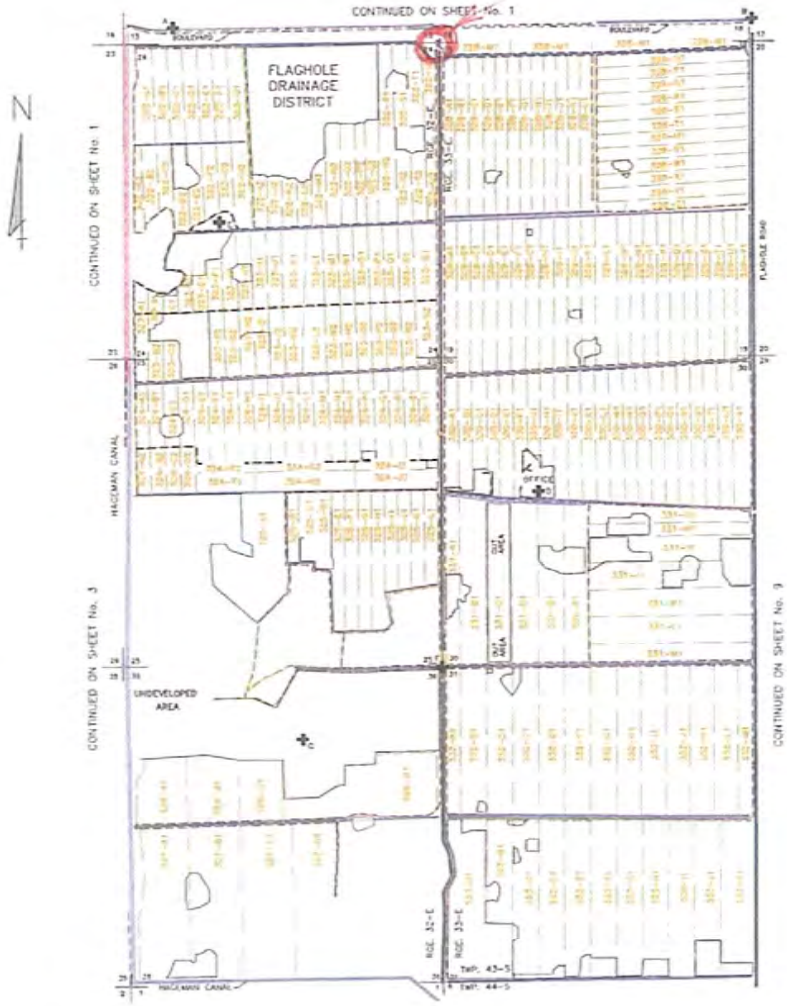
SCALE: 1" = 2,000'

38


O = SAMPLER W/ FLOW
100% LAND PURCHASE
N
L-3 CANAL
L-7 CANAL
CANAL 5
CANAL 6
CANAL 7
VEGETATIVE AREA No.1 143 ACRES
VEGETATIVE AREA No.2 104 ACRES
VEGETATIVE AREA No.4 63 ACRES
VEGETATIVE AREA No.5-N 493 ACRES
VEGETATIVE AREA No.5-S 568 ACRES
VEGETATIVE AREA No.3 844 ACRES
VEGETATIVE AREA No.6 45 ACRES
OFFICE
39
UNITED STATES SUGAR CORPORATION
SOUTHERN CITRUS DIVISION
CULTIVATION MAP
2007
SCALE 1" = 3,000'

ALCOMA CITRUS

SAMPLER W/ FLOW



100% PURCHASE

40

UNITED STATES SUGAR CORPORATION

ALCOMA CITRUS CULTIVATION MAP

FLAGHOLE DRAINAGE DISTRICT

2007 SCALE 1" = 2,000'

EXHIBIT B TO SCHEDULE 3.1-A

Table 1. Summary of USSC Sub-basin Discharges.
(Historical Water Quality, 3-yr Targets and Limits, BMP Points and Associated Acreages)

UAID	Basin ID	Total WY08 Area acres	Historical Average 3-yr Discharges WY1999-2008 unless otherwise noted TP Conc ppb	Flow AF	TP Load kg	UAL #/ac	TP Targets 3-yr TP Conc ppb	3-yr UAL #/ac	Begin BMP Points	Existing TP Level Above Target?	First WQ Assess. Year	90% Conf. Level TP Limits 3-yr TP Conc ppb	3-yr UAL #/ac	90% Conf. Level Joint Exceed. Freq. Conc	UAL	Both	95% Conf. Level Annual Limit TP Conc ppb	Annual Limit UAL #/ac
S-5A Sub-basin																		
186	50-018-02	6,594	154	20,109	3,830	1.3	200*	1.2*	35	Yes	WY2013	N.I.	N.I.	N.I.	N.I.	N.I.	N.I.	N.I.
S-8 Sub-basin																		
012	26-010-02	9,961	185	19,424	4,442	1.0	185	1.0	25	No	WY2010 **	265	1.5	0%	0%	0%	292	1.7
014	50-018-06	1,255	135	2,714	450	0.8	135	0.8	25	No	WY2010	176	1.3	0%	17%	17%	190	1.4
015	50-018-04	1,913	88	4,738	516	0.6	88	0.6	25	No	WY2010	98	0.9	17%	17%	33%	102	1.0
016	50-018-05	1,827	270	4,658	1,551	1.9	200*	1.2*	35	Yes	WY2013	N.I.	N.I.	N.I.	N.I.	N.I.	N.I.	N.I.
017	50-018-22	4,481	126	12,100	1,878	0.9	126	0.9	25	No	WY2010	148	1.3	17%	17%	17%	156	1.4
019	50-018-09	1,737	134	5,642	933	1.2	134	1.2	25	No	WY2010	152	1.8	17%	17%	17%	158	2.1
020	50-008-01	7,261	87	10,736	1,157	0.4	87	0.4	25	No	WY2010	106	0.5	17%	0%	17%	112	0.6
054	50-018-23	2,946	104	10,832	1,394	1.0	104	1.0	25	No	WY2010 **	134	1.6	17%	17%	17%	144	1.8
Total EAA Basin		*37,976*	*144*	*90,954*	*16,151*	*0.9*								12%	12%	17%		
SFCD	50-010-06	10,487	114.473	27,604	3,898	0.8	114	0.8	25	No	WY2010 **	129	1.1	17%	0%	17%	133	1.2
L-8 Sub-basin		3,955	TBD	TBD	TBD	TBD	TBD	TBD	35	TBD	WY2013***	TBD	TBD	TBD	TBD	TBD	TBD	TBD
C-139 Sub-basin		169,500	TBD	TBD	TBD	TBD	TBD	TBD	35	TBD	WY2013***	TBD	TBD	TBD	TBD	TBD	TBD	TBD
C-139 Ann. Sub-basin		17,841	100	42,946	5,274	0.7	100	0.7	35	No	WY2013	TBD	TBD	TBD	TBD	TBD	TBD	TBD
These targets and limits may be amended pursant to the permit authorizing operation of the C-139 Annex Pump Station																		
S-4 West Sub-basin		22,102	TBD	TBD	TBD	TBD	TBD	TBD	35	TBD	WY2013***	TBD	TBD	TBD	TBD	TBD	TBD	TBD
Hendry-Hilliard WCD		35,836	265	74,596	24,384	1.5	200*	1.2*	35	Yes	WY2013****			Not Applicable				
(Estimated from TP concentration and UAL from entire S-4 West Sub-basin.)																		
Flaghole DD		23,900	TBD	TBD	TBD	TBD	TBD	TBD	35	TBD	WY2013***	TBD	TBD	TBD	TBD	TBD	TBD	TBD
Total non-EAA			*187*	*145,146*	*33,555*	*1.2*								17%	0%	17%		
Total Discharges			*171*	*236,100*	*49,706*	*1.1*								13%	10%	17%		
Local Transition Lands		2,658	Existing 40E-63 and/or 40E-63, F.A.C. requirements															

Notes: * For those parcels showing "200*" and "1.2*" as the Targets, the performance goal is to continue improving performance until the maximum performance achievable has been demonstrated, or 200/1.2 has been achieved.

** Purchased lands will continue to implement existing BMP requirements with no additional requirements under this Schedule 4.1.A other than to submitt a performance assessment report (including evaluating on-going farming practices), if applicable.

*** Baseline conditions will be established after 3 years of monitoring. If the initial 3-year average is greater than 200 ppb or 1.2 lbs/ac then the basin will be subject to optimization in accordance with Sections (4) and (5) of Schedule 4.1.A., and Net Improvement for future assessments.
If the initial 3-year average is less than 200 ppb and 1.2 lbs/ac then the basin will be subject to maintaining existing conditions.

**** Purchased lands will continue to implement existing BMP requirements with no additional requirements under this Schedule 4.1.A other than to implement monitoring, report monitoring results, and submitt a performance assessment report (including evaluating on-going farming practices), if the 3-yr average is greater than 200 ppb or 1.2 pounds/acre.

N.I. = Net Improvement

Table 2. Initial Net Improvement Performance Measures for Basin IDs With Historical Discharges Above 200 ppb or 1.2 lb/acre

UAID	Basin ID	More Restrictive Parameter	Unit	Historical Value	20% Performance Improvement	Upper Performance Limit
S-5A Sub-basin						
186	50-018-02	UAL	lbs/acre	1.3	1.2	1.2
S-8 Sub-basin						
016	50-018-05	UAL	lbs/acre	1.9	1.5	1.7

Notes:
1) UAL – TP Unit Area Load (lbs/acre)
2) TP – Flow-weighted mean TP concentration (ppb)

Table 3. Annual Basin Rainfall and Maximum Value; values in inches per year.

Basin	WY1999	WY2000	WY2001	WY2002	WY2003	WY2004	WY2005	WY2006	WY2007	WY2008	Max	Rainfall Station
S-5A	42.22	60.12	37.60	52.09	50.27	50.17	56.66	42.93	37.33	44.18	60.12	Rule 40E-63
S-6	41.88	54.32	35.09	54.37	46.04	46.37	50.26	44.32	39.04	53.27	54.37	Rule 40E-63
S-7	41.43	59.04	38.21	49.51	44.19	43.91	44.87	51.96	40.40	50.38	59.04	Rule 40E-63
S-8	45.49	56.57	37.04	43.69	44.19	46.12	49.11	56.42	35.22	44.09	56.57	Rule 40E-63
EBWCD	26.49	37.37	21.48	25.51	33.63	33.32	39.36	29.29	24.83	47.14	47.14	DBKEYs 5962, 16191, 5835
ESWCD	26.17	40.48	28.11	30.24	37.36	31.77	44.23	38.67	25.36	47.80	47.80	DBKEYs 16191, 5835
SSDD	42.93	51.33	37.02	43.67	36.15	43.36	51.52	58.43	30.06	36.74	58.43	DBKEYs 15199, 15198
SFCD	48.73	55.68	27.68	33.99	44.11	45.85	66.17	64.19	37.71	38.12	66.17	DBKEYs 15198, 5965, 16696
L-8 (WY96-05)	53.69	39.75	40.90	28.22	47.43	27.05	35.44	33.02	35.09	49.24	53.69	S-352 (DBKEY 16693)
C-139	51.92	54.46	35.70	54.23	55.40	49.90	50.68	54.86	36.85	41.95	55.40	Rule 40E-63
C-139 Annex	42.45	58.46	42.39	48.85	52.54	53.96	51.14	59.73	50.70	49.11	59.73	DBKEYs 16224, 16606, 15685
S-4 East (WY98-07)	50.10	46.60	60.30	27.10	49.90	46.60	47.90	61.40	63.00	36.60	63.00	Clewiston F.S. (DBKEY 16696)
S-4 West (WY98-07)	50.10	46.60	60.30	27.10	49.90	46.60	47.90	61.40	63.00	36.60	63.00	Clewiston F.S. (DBKEY 16696)
Other C-43	50.10	46.60	60.30	27.10	49.90	46.60	47.90	61.40	63.00	36.60	63.00	Clewiston F.S. (DBKEY 16696)

EXHIBIT C TO SCHEDULE 3.1-A

[THIS EXHIBIT IS IN ELECTRONIC FORMAT – SEE ENCLOSED COMPUTER DISK IN THE POCKET ATTACHED HERETO.]

EXHIBIT D TO SCHEDULE 3.1-A

EXHIBIT D
SCHEDULE 3.1-B

BEST MANAGEMENT PRACTICES PLAN FOR TOTAL PHOSPHORUS AND TOTAL NITROGEN

South Florida Water Management District
3301 Gun Club Road
West Palm Beach, Florida 33406

May 11, 2009

BEST MANAGEMENT PRACTICES PLAN FOR TOTAL PHOSPHORUS AND TOTAL NITROGEN

If the South Florida Water Management District (SFWMD) exercises its option and subsequently acquires approximately 107,000 acres of Unites States Sugar Corporation's (USSC) remaining property, it is the intent of the parties to implement this Schedule 3.1-B on all of the then property leased by USSC from the SFWMD. However, the Parties recognize that if there have been substantial changes in the EAA, C-139 or other basins' BMP regulatory requirements, then the parties agree in good faith to review and incorporate the amendments necessary to adequately reflect the new requirements in this Schedule 3.1-B.

As set forth below, and in addition to the requirements set forth in the Best Management Practices Plan for Sugar Cane Production and Vegetable Farming (Schedule 3.2) and Best Management Practices (BMP) Plan for Citrus (Schedule 3.3), the lessee shall implement source controls for reducing total phosphorus (TP) in discharges for all land uses and shall monitor flow volume and nutrient concentrations at discharge points from the property as identified in Exhibit A and as detailed in a District-approved Discharge Monitoring Plan and BMP Plan. Consistent with the Everglades Forever Act, "Best management practice" or "BMP" means a practice or combination of practices determined by the District, in cooperation with the Florida Department of Environmental Protection, based on research, field-testing, and expert review, to be the most effective and practicable, including economic and technological considerations, on-farm means of improving water quality in agricultural discharges to a level that balances water quality improvements and agricultural productivity.

The lessee shall obtain a permit from the District, or agree to the modification of existing permits, in accordance with Chapter 40E-63, F.A.C., and/or Chapter 40E-61, F.A.C., as applicable, to implement an approved BMP Plan and Discharge Monitoring Plan. The BMP Plan shall consider the BMPs and equivalent points ("points") as defined by Section 1.4 of the Best Management Practices Plan for Sugar Cane Production and Vegetable Farming (Schedule 3.2) and Best Management Practices Plan for Citrus (Schedule 3.3), as set forth below.

(1) BMP PLANS AND PERMITS

(a) BMP Point Requirements

1. EAA Farms -- All farming units within the S-5A Basin shall implement BMP Plans with 35 points. Farming units outside of the S-5A Basin that have long-term historical 3-year flow weighted mean concentration (FWMC) or unit area loads (UALs) that exceed a 200 ppb total phosphorus concentration or 1.2 pounds per acre phosphorus unit area load will also implement BMP Plans with 35 points. All other farming units in the EAA that have long-term historical 3-year FWMC or UALs that are below 200 ppb and 1.2 pounds per acre (lbs/acre) will continue to maintain those historical levels in accordance with the Statistical Performance Assessment Method and continue to implement BMP Plans with 25 points. Farming units, their long-term historical FWMCs and UALs, and BMP point requirements are identified in Exhibit B.

2. Farms outside of the EAA -- Farming units in areas outside the EAA will implement BMP Plans with 35 points.

(b) Requirements for BMP Plans, Permits, and Water Quality Monitoring -- BMP Plans will be required to have adequate water management, nutrient management, and sediment and erosion control BMPs. For those areas that fall inside the jurisdictional boundaries of Chapter 40E-61 and where a General Permit was previously granted by rule or formal District action, it will be necessary for the lessee to obtain an Individual Permit meeting the BMP and discharge requirements of this Schedule.

For those areas outside the jurisdictional boundaries of Chapter 40E-63 and 40E-61, F.A.C., the lessee shall follow the same permitting process described under Chapter 40E-63, F.A.C., to obtain a staff report/permit that will become the exhibit to an executed consent agreement between the lessee and the District including a BMP Plan with 35 points (as defined above) and a Discharge Monitoring Plan contemplated by this Schedule. In cases where the lessee is a co-permittee with others, a separate permit may be used to approve the lessee's BMP and Discharge Monitoring Plans. Permit applications shall be submitted within 30 days of closing to obtain approval of BMP Plans, Discharge Monitoring Plans, and USSC Demonstration Project Scopes of Work.

1. For Basin IDs not already subject to BMP plans approved by the District, in order to begin BMP implementation immediately, the BMP Plan shall be implemented within 90 days after written approval by the District and the Discharge Monitoring Plan shall be implemented no more than 180 days from the closing of the purchase and sale agreement (regardless of whether a final permit or consent agreement has been issued). A proposed BMP and Discharge Monitoring Plan requires justification and must receive District approval for any timeframe that will take longer than these timelines to implement.

2. Regardless of the type of permit/approval obtained for the BMP Plan and Discharge Monitoring Plan (40E-63 WOD, 40E-61 WOD, consent agreement), the lessee shall monitor daily during discharge for total phosphorus in surface water discharges from the Basin ID at District-approved monitoring points and in accordance with monitoring requirements described in Chapter 40E-63, F.A.C., in order to obtain flow-weighted mean concentrations and calibrated flow measurements. Total nitrogen (TN) shall be monitored only if a TN numeric criterion or TMDL is adopted, or a TN limitation is made part of a NPDES permit requirement with respect to the following regions: the EAA, Water Conservation Areas, Lake Okeechobee or the Caloosahatchee River. Such monitoring shall be restricted to the Basin ID(s) that discharge to the applicable area. Data shall be reported to the District in electronic format within the time frame prescribed in the permit/approval issued by the District. The District will evaluate the data on an annual water year basis as set forth below.

3. USSC will have the right to install its own internal monitoring within a sub-basin and substitute this data in place of the sub-basin monitoring for the purpose of evaluating water quality in accordance with this Schedule.

(2) WATER QUALITY PERFORMANCE ASSESSMENTS

The intent of the parties is to assure that there is no degradation of performance in the Basin IDs that have historically performed below 200 ppb phosphorus and 1.2 lbs/acre, and to achieve a net improvement in those Basin IDs not achieving 200 ppb and 1.2 lbs/ac. The parties recognize that variability exists in discharge data and have developed a statistical methodology to be used in this section as a tool in evaluating the Basin ID performance. It is recognized that this methodology is not a prediction tool but rather a tool to be used as an initial indicator of Basin ID performance and to be used in conjunction with additional evaluation. By virtue of the statistics utilized, the method will indicate excursions (e.g., false positives) which may or may not be actual indications of degradation, and, as a result, additional evaluation is appropriate to determine if a Basin ID is truly showing adverse performance or whether the results are due to other reasonable factors outside the control of the Lessee, including but not limited to hurricane effects, droughts, high phosphorus concentrations in Lake Okeechobee irrigation water, and other factors observed in other regional performance. Exhibit C shows an example of how the tool can indicate excursions when in fact an evaluation of reasonable factors may show adverse performance in years due to these factors.

(a) Establishing Performance Measures -- Establishing the performance measures for USSC farms was based on historical water quality levels determined from either farm level monitoring data (if available), or in the absence of farm level data, the monitoring data from the sub-basin in which the USSC Basin IDs are located. The available farm level monitoring data are representative of the discharges from a "Basin ID" which is a hydrological discharge unit identified in a BMP permit issued under Rule 40E-63 (F.A.C.).

1. For each USSC Basin ID or sub-basin (when applicable), an average value was established for both a 3-year moving flow-weighted mean TP concentration (FWMC) and 3-year moving average Unit Area Load (UAL) based on a ten year historical (long-term) period of record (see **Exhibit B, Tables 1 and 2**). Based on these averages, performance measures were established for each "Basin ID" or sub-basin depending on whether the averages were below or above 200 ppb or 1.2 lbs/acre. The performance measure was therefore set based on the following criteria:

   a. a flow-weighted mean TP concentration of 200 ppb, or the historical average 3-yr flow weighted mean discharge TP concentration, determined from the 10-year period of historical record, if lower and

   b. a Unit Area Load (UAL) of 1.2 pounds/acre, or the historical average 3-yr moving average UAL determined from the 10-year period of historical record, if lower.

2. Farms (within Basin IDs or sub-basins) that historically show achievement of levels lower than 200 ppb and 1.2 pounds per acre, shall maintain the historical flow weighted mean concentrations and unit area loads (see **Exhibit B, Tables 1 and 2**) as performance measures in order to prevent water quality "backsliding".

3. For USSC farms within sub-basins not having Basin IDs, those farms will be grouped into Basin IDs (to be assigned) and the monitoring data representative of those Basin IDs will be aggregated for consistency to facilitate a comparison with the performance measures that were established based on sub-basin water quality levels.

4. An annual performance assessment will be conducted for each Water Year (May 1st – April 30th) and will consist of:

   a. Calculating a 3-yr moving average TP flow-weighted mean concentration (FWMC) and 3-yr moving average TP UAL for each year based on the current water year and previous two water years of observed data. The 3-yr moving average TP FWMC will be calculated as the sum total of the TP load (kilograms) divided by the sum total Flow (acre-feet) for the Water Year assessment period, and multiplied by a conversion factor to obtain a flow-weighted mean TP concentration for the overall three Water Year period. The 3-yr moving average TP UAL will be calculated as the average of the three Water Years during the assessment period.

   b. Applying a statistical assessment method (described in Section 2.b) to determine if performance measures are being achieved.

(b) Statistical Performance Measure Assessment Method -- In order to assess progress with meeting performance measures, the assessment methodology in this section is grouped into two categories based on whether the Basin ID performance measure is to: 1) maintain historical water quality levels (FWMC and UAL) for Basin IDs historically below 200 ppb and 1.2 lb/acre, or 2) achieve progress toward meeting the performance measures of 200 ppb and 1.2 lbs/ acres for those Basin IDs that were historically above these levels. For Basin IDs required to maintain their historical levels, a variability component is incorporated into the assessment method. For those Basin IDs that have historical water quality levels above 200 ppb or 1.2 lbs/acre, a "Net Improvement" methodology

is incorporated into the assessment method. The methodology is set forth as follows and is explicitly described in the spreadsheet included in the electronic file attached as **Exhibit C**, which includes a description of historical variability.

1. ***Establishing Variability Factors*** – *For Basin IDs with Historical Water Quality* ***Below*** *the 200 ppb and 1.2 lbs/acre Performance Measures.*

   a. TP Limits for both TP Concentration and UAL were established for each Basin ID or sub-basin based on the natural variability exhibited by Basin ID discharges. Limits were calculated at the 90% confidence level using the following equation and are presented in **Tables 1 and 2 (Exhibit B)**:

   $L_{90\%} = m + s\, t_{90\%,df}$

   where, $L_{90\%}$ = annual limit at the 90% confidence level
   m = average 3-yr cumulative flow-weighted mean TP concentration (and UAL) during the 10-yr period of record
   s = standard deviation of the average 3-yr cumulative flow-weighted mean TP concentration (and UAL) during the 10-yr period of record
   $t_{90\%,df}$ = 1-tailed t statistic at 90% confidence level and with df degrees of freedom
   df = N – 1
   N = number of 3-yr average values

   b. An overall excursion frequency was determined based on a comparison of each Basin ID or sub-basin to the criteria below. Applying the below criteria to the ten year historical record of 3-year moving averages of all Basin IDs or sub-basins in this category yielded an overall excursion frequency due to normal variability of 15%. Excursion frequency is defined as the total number of excursions divided by the total number of USSC Basin IDs and sub-basins; if any one or more of the criteria below is not met for a Basin ID or an aggregated basin (in case additional basin IDs are created within one existing sub-basin), it is considered a single excursion.

      i. At least one in three successive years the 3-yr moving average TP concentration shall to be at or below the 3-yr Target concentration (identified in **Tables 1 and 2, Exhibit B**).
      ii. At least one in three successive years the 3-yr moving average TP UAL shall to be at or below the 3-yr Target UAL (identified in **Tables 1 and 2, Exhibit B**).
      iii. The 3-yr moving average TP concentration shall be at or below the TP Limit concentration (identified in **Tables 1 and 2, Exhibit B**).
      iv. The 3-yr moving average UAL shall be at or below the TP Limit UAL (identified in **Tables 1 and 2, Exhibit B**).

2. ***Establishing "Net Improvement" Factors*** – *For Basin IDs with Historical Water Quality* ***Above*** *the 200 ppb or 1.2 lbs/acre Performance Measures.*

   a. The performance measure for those Basin IDs with historical TP discharges above the 200 ppb or 1.2 lbs/acre thresholds is to achieve these performance measures or otherwise demonstrate a meaningful net improvement in TP performance. In some Basin ID cases, achieving these performances measures (200 ppb and 1.2 lbs/acre) may require very little in the way of reductions (i.e. going from an average historical level of 225 ppb to an

average target of 200 ppb). In other Basin ID cases, the reductions would need to be much greater (i.e. going from an average historical level of 386 ppb to an average target of 200 ppb). Therefore, it would be expected that discharges from some Basin IDs will be reduced sufficiently to achieve the 200 ppb and 1.2 lb/acre performance measures, while others discharges may not.

b. At the present time, there is no guidance for establishing with certainty a quantitative TP performance measure associated with increasing the BMPs from 25 points to 35 points, an increase of 40%. Hence, for the purpose of establishing a meaningful net improvement performance measure, it is necessary to make an assumption, and it was therefore assumed that the 40% increase in BMP points will potentially achieve a 20% performance improvement over the period of three years. By limiting the assumed performance improvement (20%) to one-half of the relative BMP point increase (i.e. 40%), this assumption acknowledges the diminishing returns associated with BMP water quality improvements.

c. In some of these Basin IDs, the historical TP concentration was below the 200 ppb threshold, indicating the UAL is the parameter that needs to be reduced towards the 1.2 pounds per acre threshold. In other Basin IDs, the historical UAL was below the 1.2 pounds per acre threshold, and for those Basin IDs it was the TP concentration that needs to be reduced towards the 200 ppb threshold. A summary of the more restrictive TP parameter, and the estimate of a "*20% Performance Improvement*" is identified in **Table 3 of Exhibit B**. In recognition of the uncertainty in the expected performance and variability, a deviation of 50% (the "*Upper Performance Limit*") of the TP improvement from historical levels will be applied during the annual assessment.

(c) Annual Performance Assessment -- For the water year ending April 30, the District will perform an annual assessment of the TP discharges from each USSC Basin ID based on observed monitoring data submitted by USSC. In cases where new Basin IDs are assigned within sub-basins, the observed monitoring data for the Basin IDs within each sub-basin will be aggregated for evaluation. If the aggregate result shows that performance measures are not being met, an evaluation of each Basin ID will be conducted to ascertain if additional water quality improvement activities will be necessary on all Basin IDs within the sub-basin or for a particular individual Basin ID only. The following describes the assessment steps for Basin IDs required to either maintain historical water quality (for those Basin IDs below 200 ppb and 1.2 lbs/acre) with a variability component, or achieve a "Net Improvement" (for those Basin IDs above 200 ppb or 1.2 lbs/acre).

1. ***All Basin IDs*** -- An annual assessment will be conducted for each Basin ID for each water year (May 1st – April 30th). For the EAA sub-basins, farming units identified by their Basin ID numbers in **Table 1 (Exhibit B)**, will be evaluated. For the following non-EAA sub-basins, the cumulative discharge from USSC Basin IDs will be evaluated within each individual sub-basin: C-139, L-8, S-4 East, S-4 West, C-43, EBWCD, ESWCD, SSDD, SFCD, and C-139 Annex. In the event that additional Basin IDs are not created for USSC farming units in the EBWCD, ESWCD, SSDD, SFCD, and C-139 Annex, the sub-basin as a whole will be evaluated. The 3-yr moving average TP flow-weighted mean concentration and 3-yr moving average TP unit area loading (UAL) will be calculated each year for each Basin ID or sub-basin as applicable.

2. ***Basin IDs with Historical Water Quality -- <u>Below</u> the 200 ppb and 1.2 lbs/acre Performance Measures (see Figure 1 in Exhibit B for flow chart of this process)***

a. Of the total USSC Basin IDs and sub-basins, the overall excursion frequency will be calculated each water year for each Basin ID based on the criteria outlined in Section 2.b. To maintain consistency in calculating the overall excursion rate, new Basin IDs assigned within sub-basins will be treated (through aggregation of the observed monitoring data) as one area.

b. If the overall excursion frequency is greater than 15%, then each Basin ID that contributed to the overall excursion will be deemed to not achieve their performance measures, unless the USSC submits an Assessment Report identifying valid Basin ID-specific factors outside USSC control (described in Section 2.e) that contributed to the higher than expected excursion frequency.

c. If the overall excursion frequency is less than or equal to 15%, the excursion frequency expected due to normal variability, then all USSC Basin IDs will be deemed to have achieved the performance measures, with the exception of Basin IDs determined by the District to have excessive TP levels as described below.

d. Regardless of the results of the excursion frequency assessment, discharges from individual Basin IDs will be assessed for excessive TP levels each water year. The 95% Confidence Limits in **Tables 1 and 2 (Exhibit B)** reflect an upper bound above the TP Targets, as defined by the variability exhibited in the 10-yr calibration period. If an individual Basin ID discharge exceeds the 95% confidence limit TP concentration or UAL, then the Basin ID will be deemed to not achieve their performance measure, unless the USSC submits an Assessment Report identifying valid Basin ID-specific factors outside USSC control (described in Section 2.e) that contributed to the excessive TP levels. Assessment Report requirements are outlined in Section 2.d.

e. The annual performance assessment will not be conducted in water years when rainfall in the sub-basin, where the farming units are located, exceeds the maximum annual sub-basin rainfall or is below the minimum that occurred during the 10-yr calibration period (see **Table 4, Exhibit B**). If a year is excluded based upon this criterion, results from adjacent years will be treated as consecutive in assessing performance.

3. ***Basin IDs with Historical Water Quality -- <u>Above</u> the 200 ppb or 1.2 lbs/acre Performance Measures (see Figure 2 in Exhibit B for flow chart of this process).***

a. Only one TP parameter will be assessed against the net improvement performance measure, as identified in **Table 3 of Exhibit B**. In recognition of the uncertainty in the expected performance and variability, a deviation of 50% of the TP improvement from historical levels will be applied, and this is referred to as the "*Upper Performance Limit*".

b. If the calculated 3-yr moving TP value is above the limit of the respective performance measure, the Basin ID will be deemed to not achieve its "Net Improvement" performance measure, unless the USSC submits an Assessment Report identifying valid Basin ID-specific factors outside USSC control (described in Section 2.e) that contributed to the levels of TP in the discharge.

c. The annual performance assessment will not be conducted in water years when rainfall in the sub-basin, where the farming units are located, exceeds the maximum annual sub-basin rainfall or is less than the minimum annual sub-basin rainfall that occurred during the 10-yr calibration period (see **Table 4, Exhibit B**). If a year is excluded based upon

this criterion, results from adjacent years will be treated as consecutive in assessing performance.

d. Once a Basin ID achieves the "*20% Performance Improvement*" measure in **Table 3 of Exhibit B**, that Basin ID will be assessed in future years based on the new performance measure in accordance with Section 2.c.2 above. The limit would be established in accordance with Section 2.b.1, with the additional need to re-scale the historical data to the "20% Performance Improvement" as the new long-term performance measure.

4. ***Annual Performance Assessment Timelines.***

a. By May 1 of each year, the District will provide a preliminary draft status of the current Water Year's TP performance assessment for each Basin ID.

b. By August 1 of each year, the District will provide a status report of the previous Water Year's TP performance assessment for each Basin ID.

(d) USSC Assessment Report Requirements -- the Assessment Report submitted by USSC will be subject to the following:

1. The USSC Assessment Report shall be submitted by November 1. Within 30 days of receipt of the Assessment Report, the District will notify USSC of the final determination of their findings.

2. If the District determines that the USSC Assessment Report reasonably explains why the USSC discharges did not achieve the performance measures set forth above, then no additional water quality improvement activities will be required for that Water Year.

3. If the District determines that the USSC Assessment Report does not reasonably explain why the USSC discharges did not achieve the performance measures set forth above, then USSC will submit a permit application to modify the existing BMP implementation plan to either increase the BMPs to 35 points, optimize an existing 35 point plan, or implement a USSC demonstration project, as applicable. All of these are to be permitted and implemented by April 30 (the end of the Water Year in which the USSC Assessment Report is submitted as conditioned in Section 2.d.1).

4. The Assessment Report may include evaluation of data, factors and analysis of the Maximum Performance Achievable as defined below, and shall be considered by the District in the determination of whether or not the performance measures have been achieved.

(e) Factors Outside USSC Control -- In the event that discharges from USSC Basin IDs do not achieve the performance measures as defined above, USSC will prepare and transmit an Assessment Report identifying valid factors outside USSC control as described below. The Assessment Report shall identify Basin IDs that contributed to not achieving the specified performance measures. The District will determine if the factors identified in the Assessment Report are valid. If the District determines that the Assessment Report provides valid justification, the District shall exclude the Basin ID from being required to implement additional water quality improvement activities for that Water Year. Examples of factors include, but are not limited to, those identified below:

1. ***Extreme Hydrologic Events.*** The presence of extreme hydrological (e.g. hurricanes or droughts) events may be identified by USSC in their Assessment Report. The multi-year (i.e., residual) effects of these extreme events may be cited as a specific factor influencing performance.

2. ***Above or Below Average Rainfall.*** The potential for the unit area load (UAL) of a Basin ID to be influenced by above average or below average rainfall may be evaluated by the Lessee as a factor for not achieving the UAL or the concentration targets and may be identified by USSC in their Assessment Report.

3. ***Rainfall Runoff Relationship.*** The potential for the UAL of a Basin ID or concentration to be explained by the sub-basin rainfall/TP load relationship or other regional relationship may be evaluated by the Lessee as a factor for not achieving the UAL or concentration and may be identified by USSC in their Assessment Report.

4. ***Emergency Conditions.*** Discharges will be allowed in accordance with the emergency provisions of Chapter 373, F.S.

5. ***High Lake Stages.*** For the Ch 298 Districts, L-8 and S-4 sub-basins, additional seepage may be induced by high stages of Lake Okeechobee. Recognizing this factor, Lake Okeechobee stage can be compared to the maximum annual average stage that occurred during the 10-yr calibration period (SFWMD DBKEY 15611; **Table 4, Exhibit B**). For the Ch. 298 Districts, the 10-yr period covered WY1999-2008, with an observed maximum annual average stage of 15.6 ft NGVD. For the L-8 sub-basin, the 10-yr period covered WY1996-2005, with an observed maximum annual average stage of 16.3 ft NGVD. For the S-4 sub-basins, the 10-yr period covered WY1998-2007, with an observed maximum annual average stage of 15.7 ft NGVD.

6. ***TP Concentration of Lake Okeechobee Deliveries.*** Basin ID discharges may be influenced by TP concentrations in Lake Okeechobee deliveries used for irrigation. The Assessment Report may provide an evaluation showing that a correlation exists between irrigation water quality data (for each Basin ID not meeting the performance measure for consideration) and Lake Okeechobee releases such that the releases are a contributing factor influencing Basin ID performance.

7. ***Random & Historical Variation.*** The Lessee may report any statistical uncertainty in the methodology using acceptable scientific methods In recognition of the statistical uncertainty associated with the derivation of the TP Limits, the Lessee will evaluate the potential for statistical, data measurement or other error including the cumulative Type I errors, the effect of rounding the UAL to two decimal places, historical Joint Exceedance Frequencies for Basin IDs as identified in Tables 2 and 3, and the historical exceedance frequencies for individual 3-year averages that ranged from 9% to 41%. Random variation may also include sampling and analyses variations.

8. ***Other Factors.*** Unavoidable legal barriers or restraints, including those arising from actions or regulations not under the control of USSC.

(f) A Basin ID will be required to implement additional water quality improvement activities subject to the requirements of this Schedule if the District determines, after consideration of USSC's Assessment Report, that established performance measures are not being achieved in accordance with the annual performance assessment method described above.

(3) IMPLEMENTION OF WQ IMPROVEMENT ACTIVITIES

It is the intent of this section and Section 4 to describe the process of implementing water quality improvement activities if the performance measures in the preceding section are not achieved. Most of the USSC farms have existing BMPs in place. The Parties recognize that there is uncertainty as to the effectiveness of additional BMPs, and that there are diminishing returns on implementing additional BMPs. Many factors contribute to this uncertainty, including TP cycling in the aquatic systems, TP transport issues, inherent background TP levels, Lake Okeechobee concentrations and loads and human interaction effects that might obscure or negate the effects towards achieving further farm level TP load reductions. Through additional on-farm studies, demonstration projects and development programs, at some point in the future the Parties may find that additional BMP implementation is not technically or economically feasible. This point is referred to as the Maximum Performance Achievable (MPA).

Existing data demonstrate that BMPs in the EAA are capable of sustaining a basin-wide long-term average reduction in TP loads of 50%, and that at some point in the future, further efforts towards increasing the reduction may not be technically or economically feasible. BMP research and applications recognize that the majority of the reductions in TP loading at the farm level are due to changes in water management schemes that reduce volumes and concentrations of water actively pumped off-farm in rainfall events, sediment controls or fertilizer controls.

For Basin IDs required to implement water quality improvement activities (new BMP Plan, BMP optimization plan or participation in a USSC Demonstration Project), evaluation for achievement of performance measures will occur in the year following the third full Water Year after the District-established deadline for implementation of the approved BMP Plan and Discharge Monitoring Plan, and annually thereafter, as set forth in applicable permit or consent agreement. (Stated differently, whenever a new water quality improvement BMP plan is required as a result of not achieving the Performance Measures, the third annual performance assessment following the implementation deadline[1] will be used for the next performance assessment.) This will allow for a 3-year response time prior to any future implementation of additional water quality improvement activities. Annual evaluations for achievement of performance measures will begin immediately for those Basin IDs that are already required to implement the appropriate BMP levels and monitoring requirements.

In the event Performance Measures are not maintained or achieved 3 full water years after implementation, the Lessee shall implement the following remedial measures. For Basin IDs implementing BMP Plans with only 25 BMP points, the BMP Plan and permit shall be modified to include a total of 35 BMP points and implemented in accordance with the procedures and timelines set forth above. For Basin IDs that do not achieve the performance measures and already have permits to implement BMP Plans with 35 BMP points, the Lessee shall work cooperatively with the District to develop a BMP Optimization and Water Quality Improvement Plan, discussed below, that optimizes the BMP plan in order to achieve the performance measures. Additional BMP points or water quality improvement plans shall be approved by the District and incorporated into the applicable permit/consent agreement and shall comply with the requirements described below.

A Basin ID must meet the Performance Measures as described above regardless of the status of the EAA basin-level or farm-level compliance under Chapter 40E-63, or other compliance requirements under Chapter 40E-61. On lands with more stringent nutrient reduction and monitoring requirements than under this Schedule, the more stringent requirements, related to the existing permitted BMP plan, discharge monitoring plan, and compliance requirements, shall apply (e.g., C-139 Annex ERP, previous Consent

[1] The District may grant an extension of the implementation deadline due to factors outside the control of USSC.

Agreements). All BMP Plans are also incorporated by reference into the Lease Agreement between the District and lessee.

(4) BMP OPTIMIZATION AND WATER QUALITY IMPROVEMENT PLANS

If, despite the implementation of a BMP Plan based on 35 BMP points, a Basin ID does not meet the Performance Measures defined in this Schedule, the Lessee shall implement a District-approved BMP optimization plan or a District-approved USSC Demonstration Project, as described below. The Lessee shall submit to the District a permit application for either the BMP optimization plan or the USSC Demonstration Project in accordance with the schedule in Section 2(d). Full implementation of a District approved BMP optimization plan and/or USSC Demonstration Project shall be completed by the deadline established in the approved plan.

(a) BMP Optimization Plans -- Optimization and water quality improvement plans shall be based on Basin ID specific site assessments of existing site conditions (e.g., soils, crops, etc.), operation techniques, farming activities, and BMPs. Proposed optimization plans shall include consideration of two sediment controls and one water management BMP. Indicated below are examples of BMP optimization activities; items 1, 2, and 3 must be considered in the lessee's proposal. If these are not possible to implement, other activities may be proposed as long as it is demonstrated that they are optimization activities resulting in new or improved BMP implementation activities. The activities are not limited to those listed below. These examples were developed based on findings by the UF-IFAS in BMP technical datasheets and the Final Report on Everglades Agricultural Area BMPs for Reducing Particulate Phosphorus Transport (June 2005) to the FDEP. If the lessee proposes other optimization efforts, they must be substantiated by technical information such as District demonstration project and UF/IFAS research results or other scientifically defensible data that is mutually agreed to by the parties. All optimization efforts will require detailed documentation for verification of implementation.

1. Install weed retention booms in the main canal at an optimal distance from the main discharge structure to ensure water quality benefits in discharges. UF/IFAS literature suggests greater than 300 m (984 ft) upstream of the main pump stations; however, this distance may be modified based on site specific conditions.

2. Mechanically remove accumulated floating aquatic vegetation, initially every six months until a site-specific schedule is established for optimal water quality results. Removed vegetation shall be placed away from any canals or ditches in a manner and at a location that will prevent reintroduction to the canals. The extent or distance of the vegetation removal activities from the main discharge structure shall be determined based on site specific conditions. There must be a technical basis to demonstrate the proposed distance is optimal for water quality improvements at the discharge structure. Schedule removal of aquatic vegetation when no immediate need for pumping is expected because physical removal will cause dislodging of detritus from the roots.

3. Determine the lowest pump velocity that meets the farm specific water management needs in addition to optimizing canal velocities targeted at minimizing transport of sediments downstream through the discharge structure during normal operation. Establish the associated canal water levels, cross sectional dimensions, and/or pump speeds to maintain that velocity and for record keeping purposes.

4. Use 5-foot vegetated buffers and berms along all ditches. Native grass or other unfertilized grasses (e.g. Bahia) should be used.

5. Measure canal sediment accumulation in the canal and sump upstream of the discharge structure, every six months initially until a site-specific schedule is established for optimal water quality results from localized canal cleaning. Determine the maximum sediment accumulation that is permissible to prevent sediment transport during pumping events based on established canal velocities. Based on these results, establish a sediment canal cleaning schedule more stringent than the historical schedule. All cleaning should take place prior to the rainy season (March) when pumping will be more frequent, and prior to the growing and hurricane season (August), when lower canal levels may need to be attained. If canal levels are lowered to facilitate canal cleaning, there shall be no off site discharges. If lowering water levels in a canal prior to sediment removal is necessary, use internal/portable pumps or gravity drainage to direct this water to fallow farms.

6. Do not pump offsite during or immediately after sediment removal is complete. Wait 24 hours or until turbidity levels return to normal conditions.

7. Start and stop pump controls must be set at elevations to prevent pump cycling and suspension of sediments. Extend pump period cycling to a minimum of eight hours or provide the basis for the optimal settings, if different.

8. Provide water management such that there is no direct discharge of rice and fallow-flooded field drainage. Retain or use for internal irrigation.
9. For vegetable crops, improve irrigation practices using soil moisture measurements to determine irrigation needs (amount and timing).
10. Optimization of vegetable nutrient application rates and control application methods (mulched beds).

(b) USSC Demonstration Projects -- For Basin IDs not achieving Performance Measures, USSC may conduct a District-approved demonstration project evaluating the efficacy of a BMP optimization project described above. The project scope will be approved by permit modification, which shall include an independent technical review.

(c) Maximum Performance Achievable -- If after BMP optimization or demonstration projects have been completed to a level such that the District finds that no further optimization activities are feasible, a Basin ID continues to not achieve the Performance Measures, the Basin ID shall be evaluated to determine if it has optimized to the maximum extent practicable for the review period based on the latest technical information available. The District will determine the MPA for a Basin ID based on data provided by USSC, IFAS or obtained through District Demonstration and Research Projects. The MPA for a Basin ID shall also consider the magnitude of the water quality benefits (in discharges from the Basin ID as well as at the STA outflow) associated with any additional activities and the diminishing returns for those efforts. The MPA is Basin ID specific and is dependent on the current levels of P in discharges as well as other factors in the Basin ID. The MPA will be based on BMP implementation and other site specific variables, and that reductions beyond this point may be cost prohibitive or technically infeasible. The MPA is based on the latest technical information available for the review period. All of the activities contributing to the MPA shall continue to be implemented unless permit modifications are approved. In the future, if additional water quality improvement measures become feasible, then an MPA can be revised.

(5) DISTRICT DEMONSTRATION AND RESEARCH PROJECTS

The Lessee shall allow the District access to all leased farms in order to conduct research, related projects, and associated monitoring designed to improve the efficacy of agricultural BMPs. The District will provide written notice and a copy of the project scope at least 120 days prior to initiation of the project.

USSC will contribute in-kind services over the period of the lease, not to exceed a value of $3 million, to facilitate the USSC Demonstration Project and the District's demonstration and research projects. The USSC in-kind services shall be calculated in accordance with the most recent cost guidelines (see http://www.economics.nrcs.usda.gov/cost/nrcscost.html) published by the United States Department of Agriculture - Natural Resources Conservation Service (USDA-NRCS), and USSC shall submit an annual report summarizing its in-kind services. The in-kind services shall include, but not be limited to:

- Assigning a USSC point of contact for demonstration projects to be responsible for the logistics and scheduling of associated activities on the farm, notifying the District of any field constraints or deviations, providing technical insight, participating in meetings, reviewing project documents, and coordinating with the District or its contractors.
- Providing man-hours and equipment to perform on-farm labor, including but not limited to, activities such as canal vegetation and sediment removal, earthwork, land preparation, planting and harvesting of crops in research plots, soil and water sample collection.
- Laboratory services to process and analyze any soil samples resulting from the analysis.
- Scientists and engineers to assist with project design, results review, and interpretation.
- Pump operation, pump operator time, flow measurement equipment, and associated expenses (e.g., fuel, maintenance) during field tests (e.g., to test slow pump velocities and effect on phosphorus loading).
- Maintaining canal management levels at the elevations required by the field tests.
- Set up and operation of water quality autosamplers for shorter composite periods than those allowed by permits.
- Installation and operation of additional water quality autosamplers at locations internal to the farm.
- Providing all project water quality and flow data from these monitoring sites to the District at a frequency described in the scope.
- The costs of collection, processing, and reporting for the laboratory analyses including those at greater frequencies as described by the project scope.
- Recording data on field logs as described by the scope of the project.
- Providing farms and labor for aquatic vegetation disposal or incorporation into soils.
- Removing vegetation to allow access to project sites (e.g., to discharge points from surface water impoundments).
- Seeding and maintenance of vegetation on berms and buffers.
- Cleaning of ditches and sumps at the frequencies required by the demonstration project.
- Making operational modifications to facilitate testing of recirculation and retention or drain down waters from fallow flooded or rice fields (e.g., via operation of weirs and risers and portable pumps).

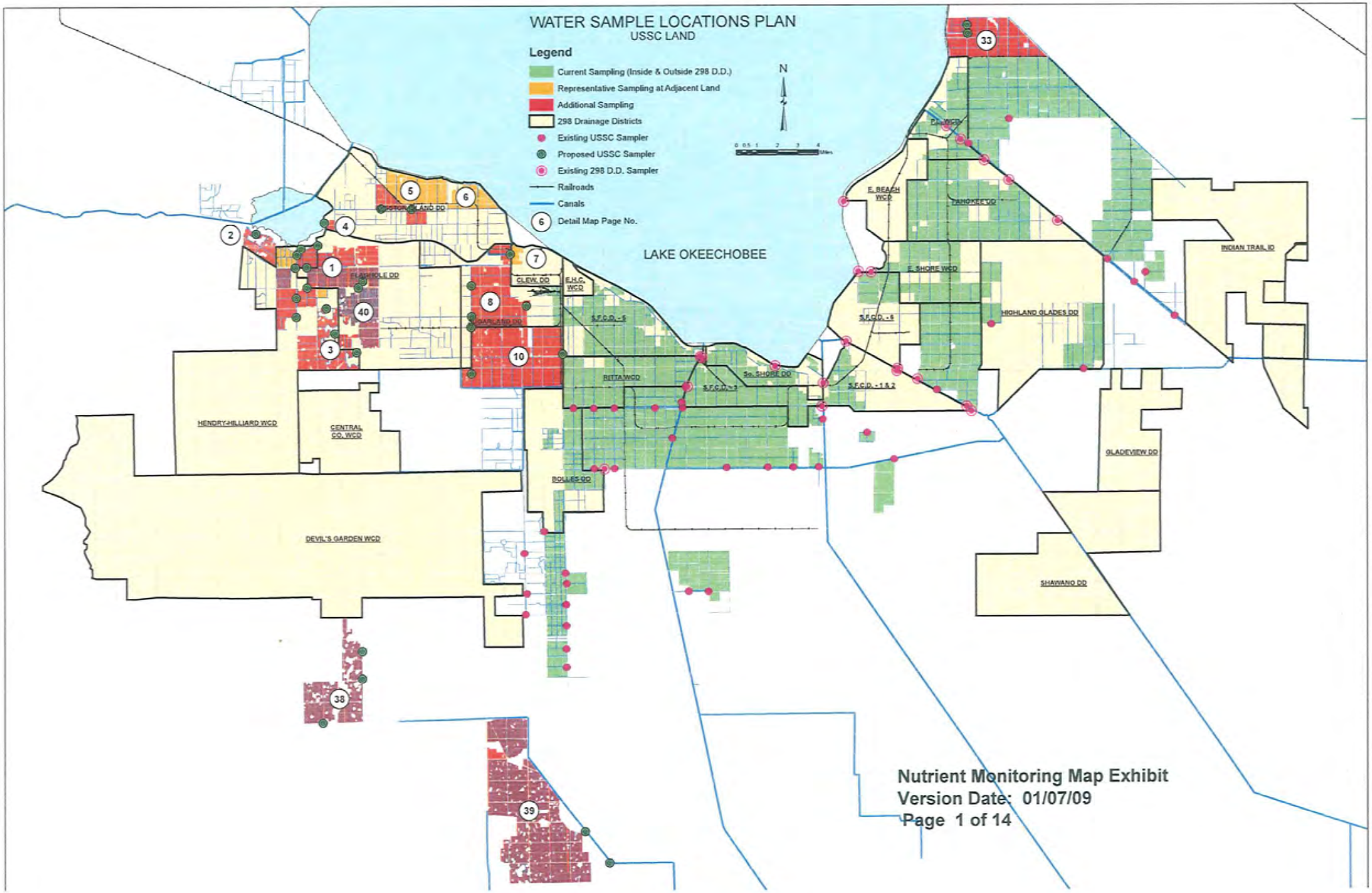
(6) DISPUTE RESOLUTION PROCESS

Disputes regarding compliance with Schedule 3.1 shall be governed by Section 7 of the Lease.

(7) AGREEMENT BY THE LESSEE AND THE DISTRICT

This Schedule 3.1-B is a negotiated BMP plan as part of the Amended & Restated Agreement for Sale and Purchase dated May 2009 between the parties. By entering into such agreement the lessee does not necessarily agree that the additional BMPs will result in reductions in STA discharge, enhanced STA performance or that additional BMPs will enhance on-farm performance. Furthermore, if the purchase and sale transaction is not consummated for any reason this BMP plan becomes null and void and the lessee does not give up any right to negotiate a different BMP approach in the future nor to give up the right to contest any proposed BMPs or BMP compliance methodology in any administrative hearing or court of law.

EXHIBIT A TO SCHEDULE 3.1-B



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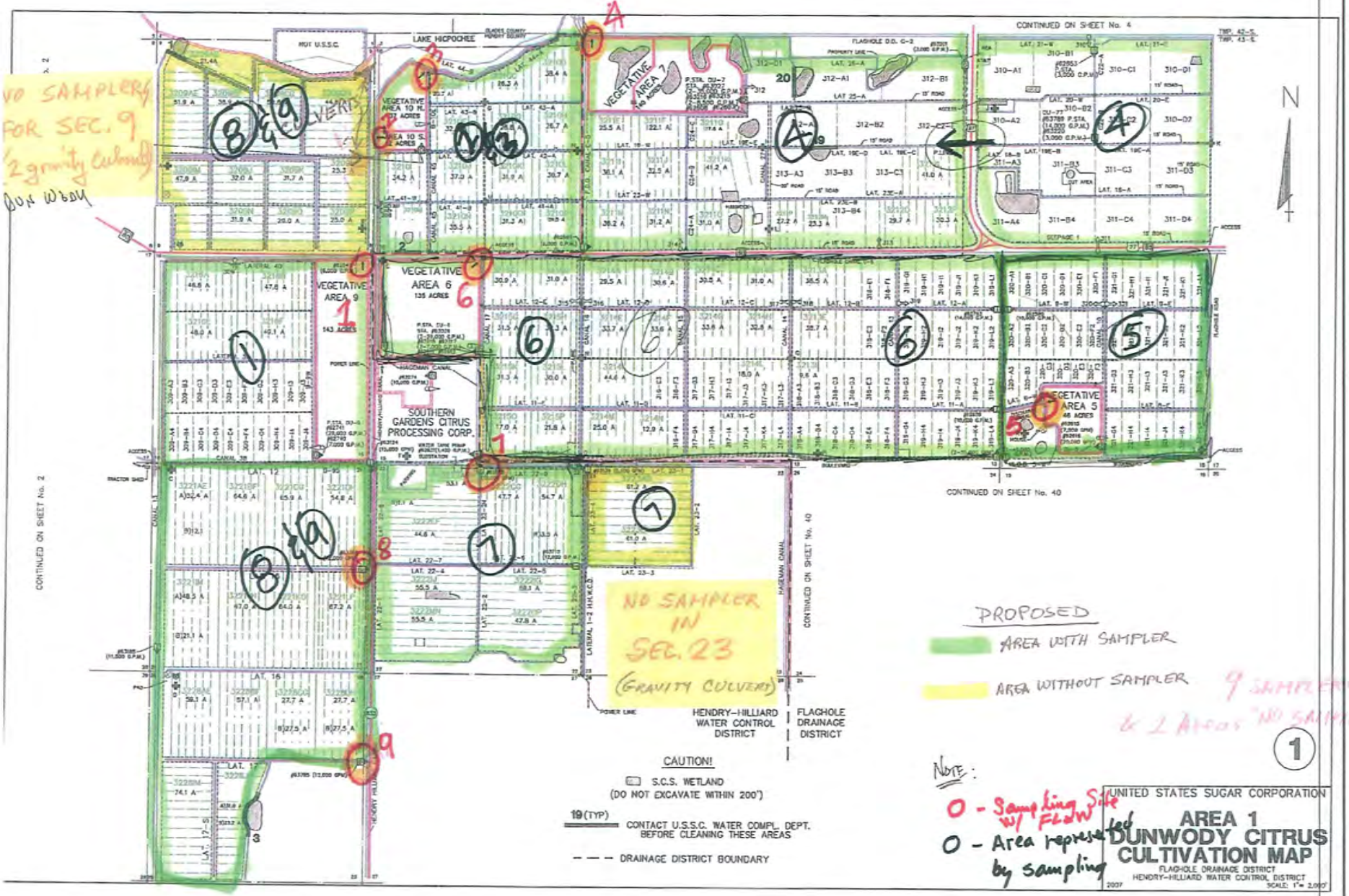
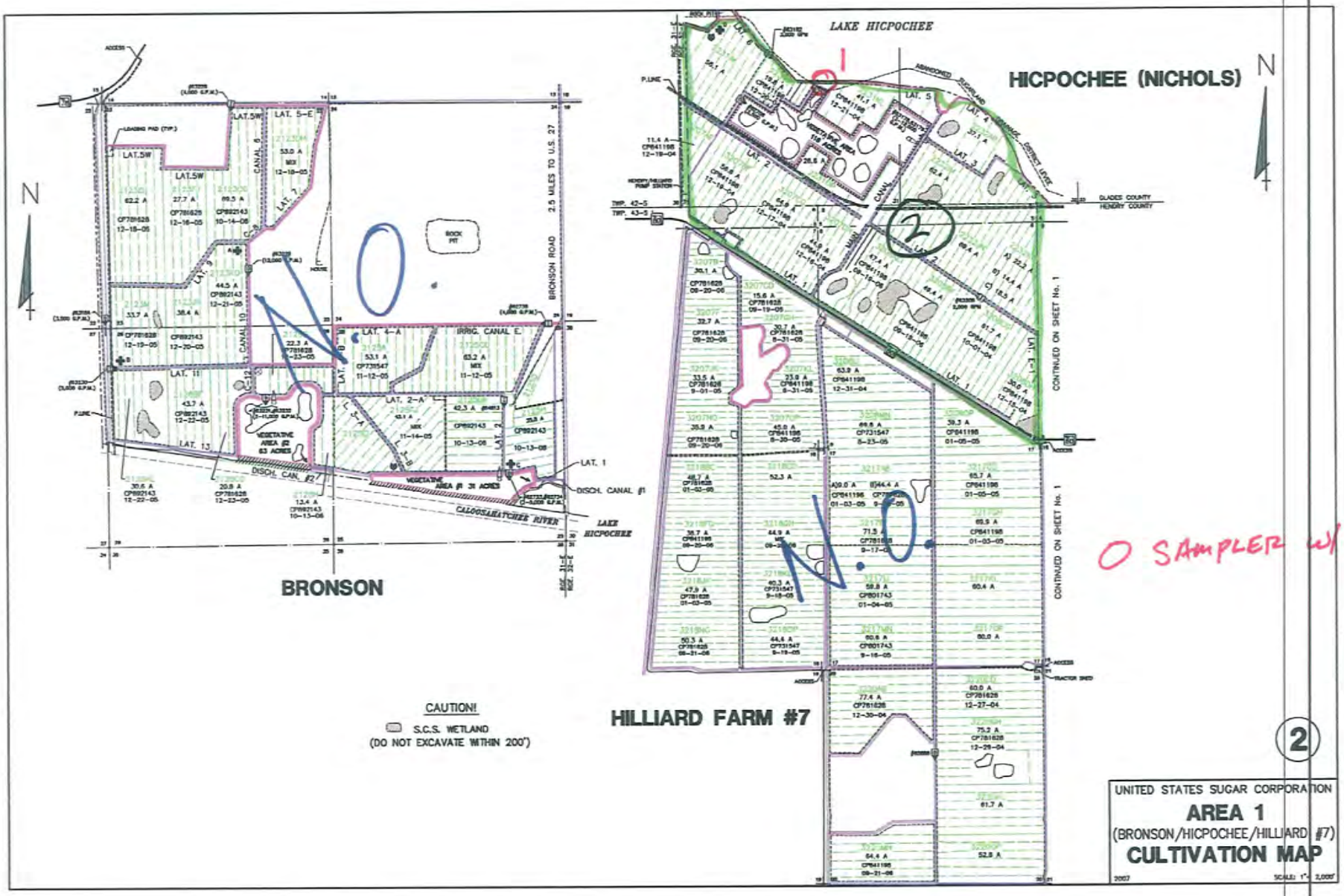
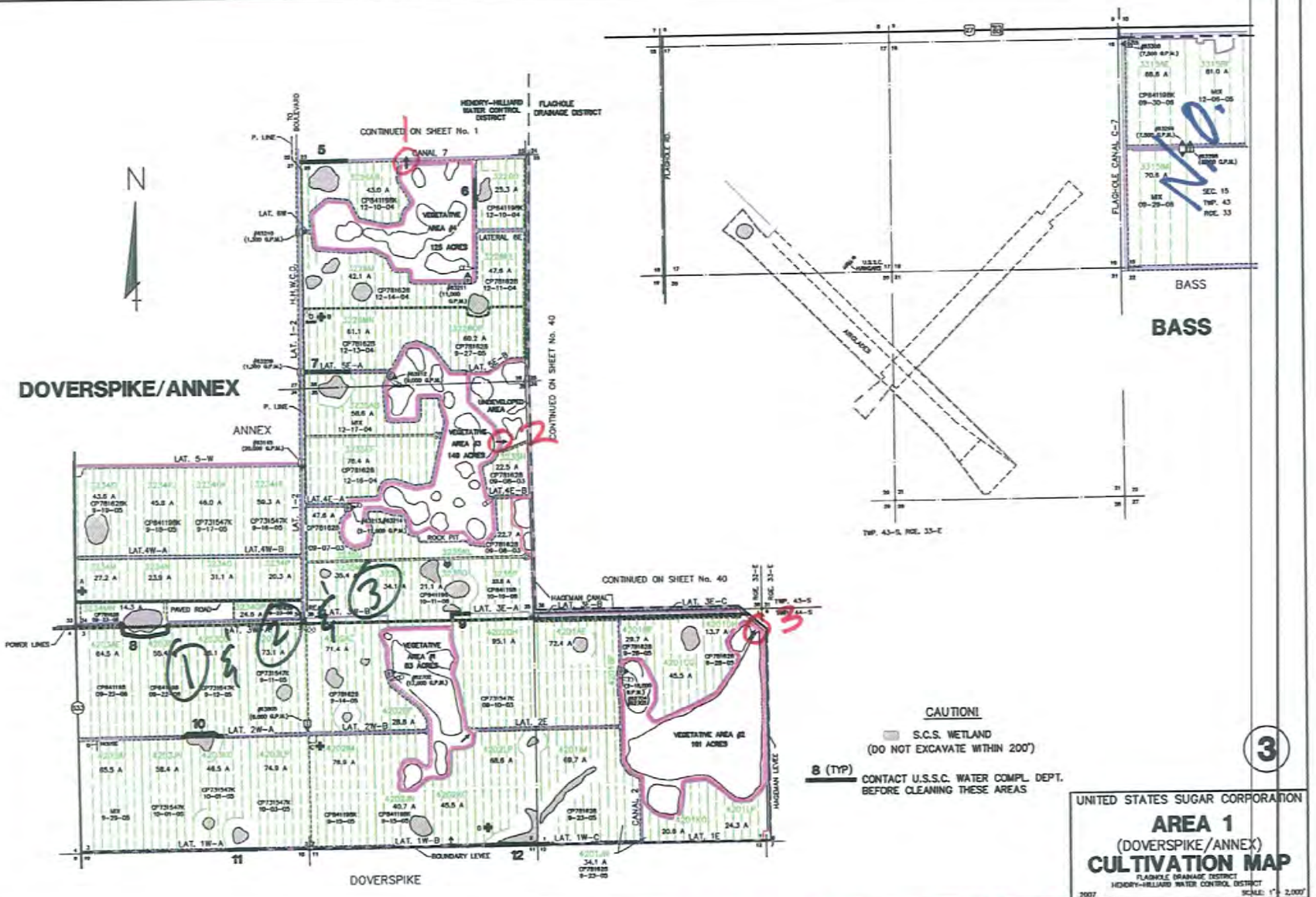
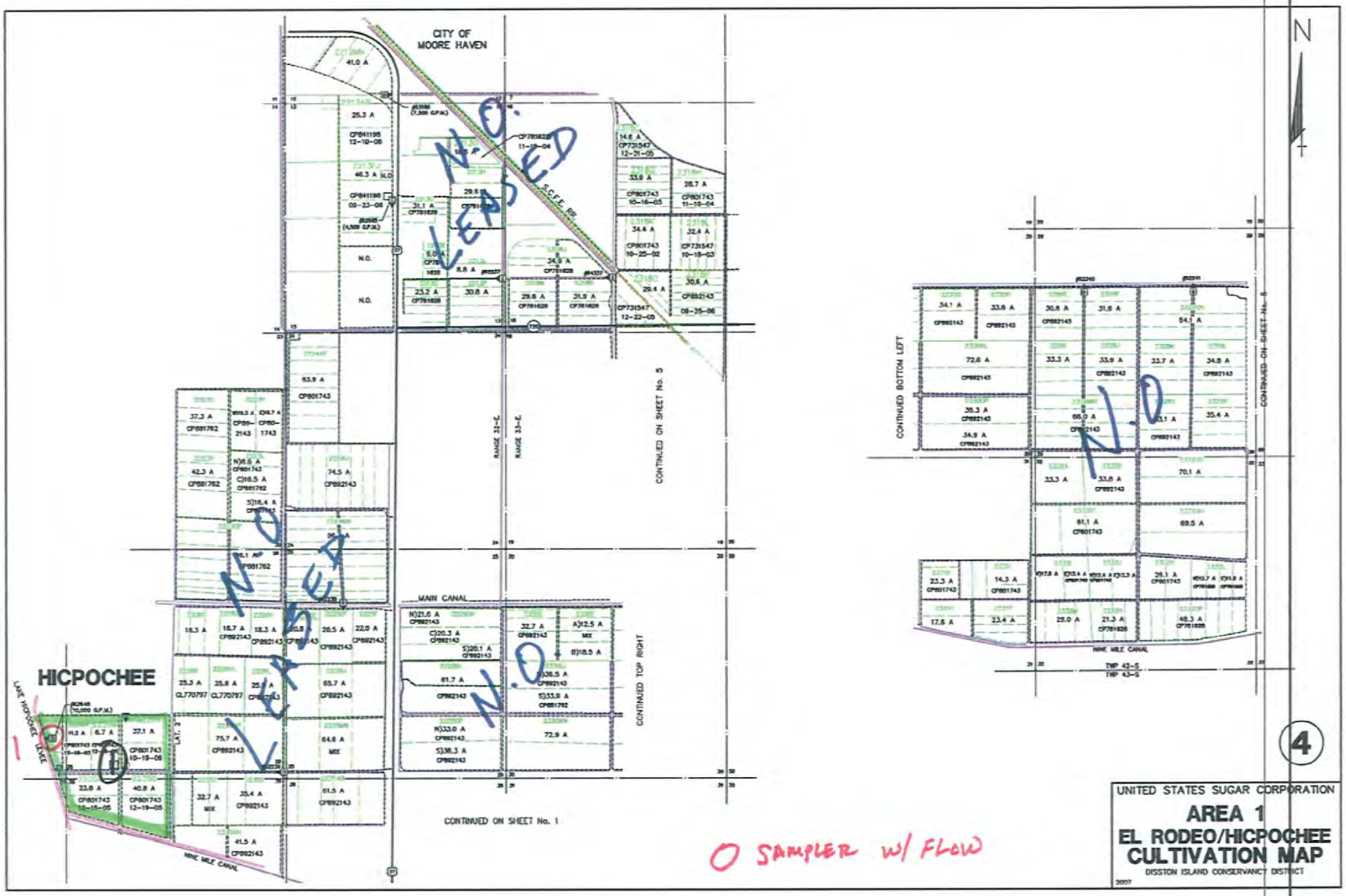
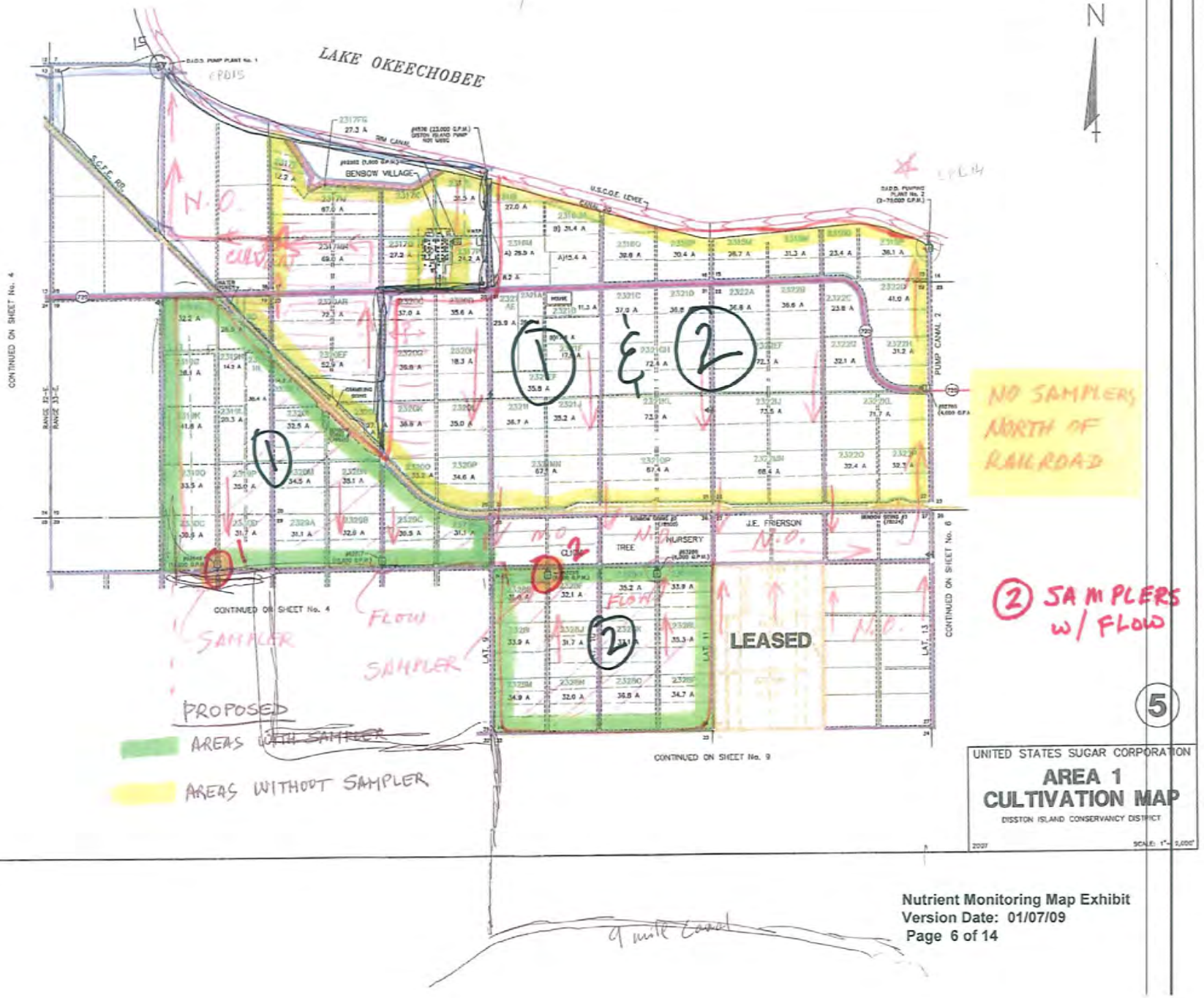

NO SAMPLERS FOR SEC. 9 (2 gravity culverts) RUN W&DY
CONTINUED ON SHEET No. 4
CONTINUED ON SHEET No. 40
CONTINUED ON SHEET No. 2
LAKE HICPOCHEE
VEGETATIVE AREA 1 143 ACRES
VEGETATIVE AREA 6 135 ACRES
VEGETATIVE AREA 7 46 ACRES
VEGETATIVE AREA 3 46 ACRES
SOUTHERN GARDENS CITRUS PROCESSING CORP.
HARDEMAN CANAL
HENDRY-HILLIARD WATER CONTROL DISTRICT
FLAGHOLE DRAINAGE DISTRICT
NO SAMPLER IN SEC. 23 (GRAVITY CULVERTS)
PROPOSED
AREA WITH SAMPLER
AREA WITHOUT SAMPLER
9 SAMPLERS & 2 AREAS NO SAMPLER
CAUTION!
S.C.S. WETLAND (DO NOT EXCAVATE WITHIN 200')
19 (TYP) CONTACT U.S.S.C. WATER COMPL. DEPT. BEFORE CLEANING THESE AREAS
DRAINAGE DISTRICT BOUNDARY
Note:
0 - Sampling Site w/ Flow Recorded
0 - Area represented by sampling
UNITED STATES SUGAR CORPORATION
AREA 1
DUNWODY CITRUS CULTIVATION MAP
FLAGHOLE DRAINAGE DISTRICT
HENDRY-HILLIARD WATER CONTROL DISTRICT
2007
SCALE: 1" = 2,000'

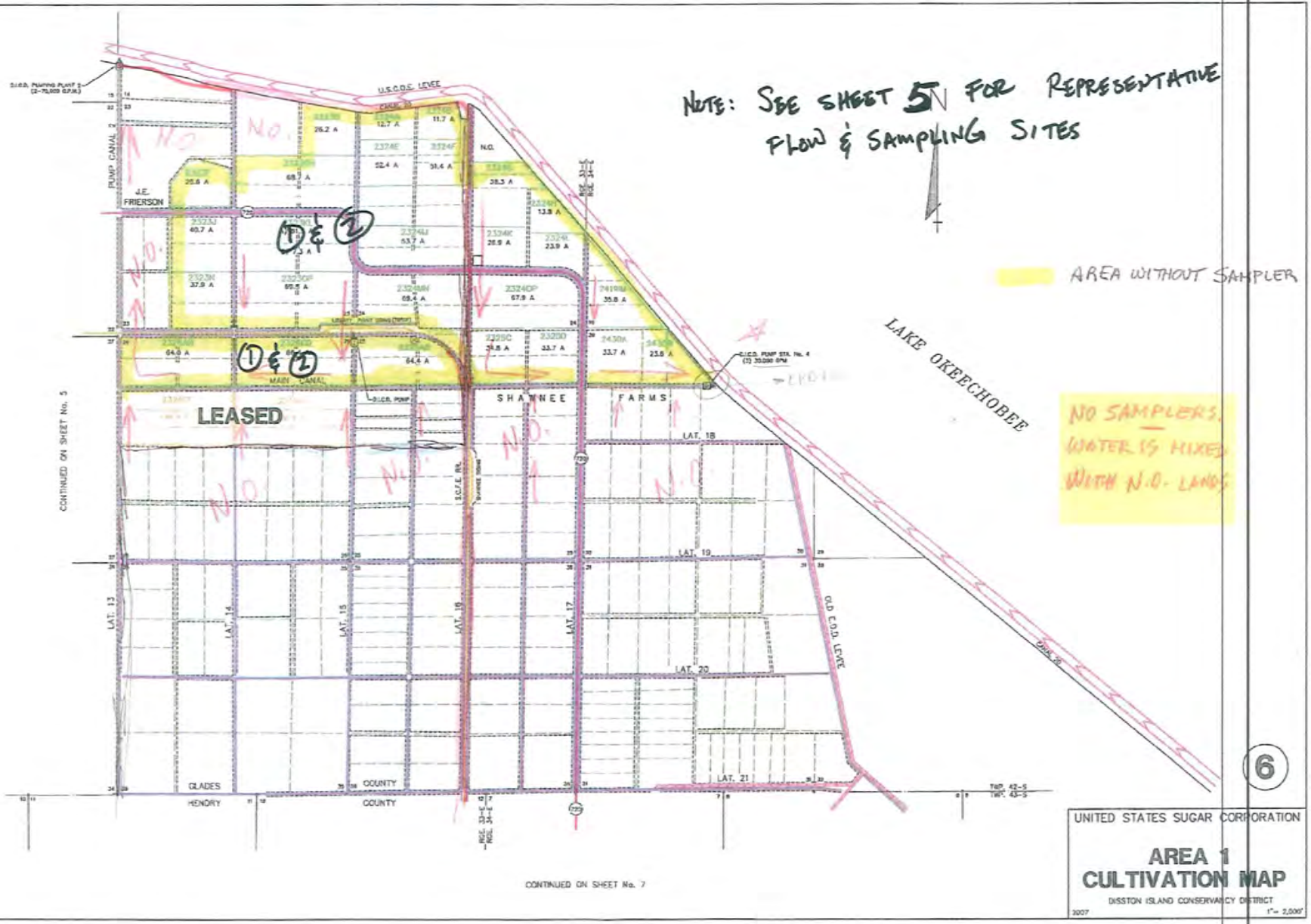

BRONSON
HICPOCHEE (NICHOLS)
HILLIARD FARM #7
LAKE HICPOCHEE
CALOOSAHATCHEE RIVER
BRONSON ROAD
2.5 MILES TO U.S. 27
DISCH. CANAL #1
DISCH. CANAL #2
VEGETATIVE AREA #1 31 ACRES
VEGETATIVE AREA #2 63 ACRES
IRRIG. CANAL E
CANAL 6
CANAL 10
CANAL 12
LAT. 1
LAT. 2
LAT. 2-A
LAT. 4-A
LAT. 5
LAT. 5W
LAT. 5-E
LAT. 11
LAT. 13
CONTINUED ON SHEET No. 1
CAUTION!
S.C.S. WETLAND
(DO NOT EXCAVATE WITHIN 200')
O SAMPLER W/ FLOW
UNITED STATES SUGAR CORPORATION
AREA 1
(BRONSON/HICPOCHEE/HILLIARD #7)
CULTIVATION MAP
2007
SCALE: 1" = 2,000'
2

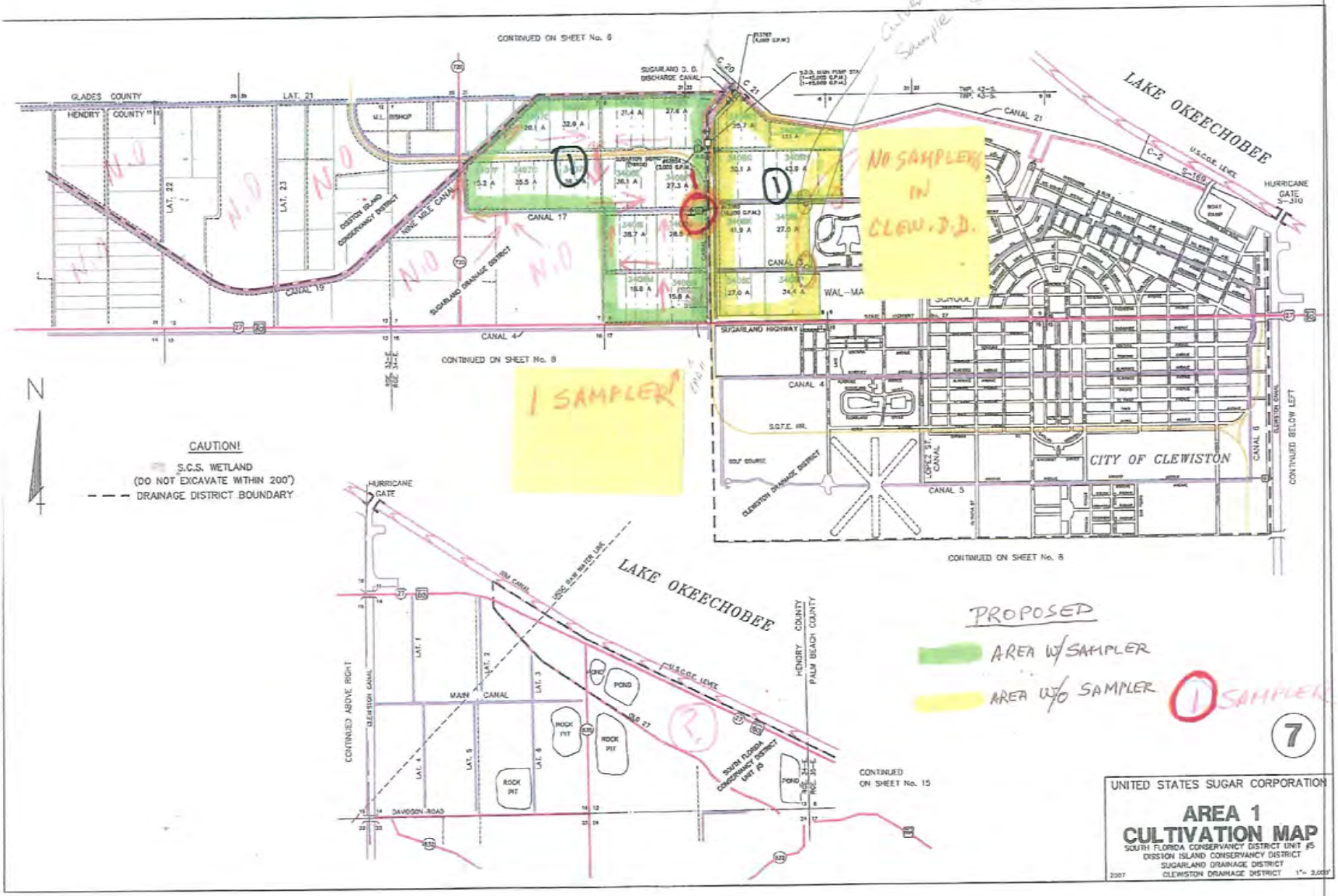


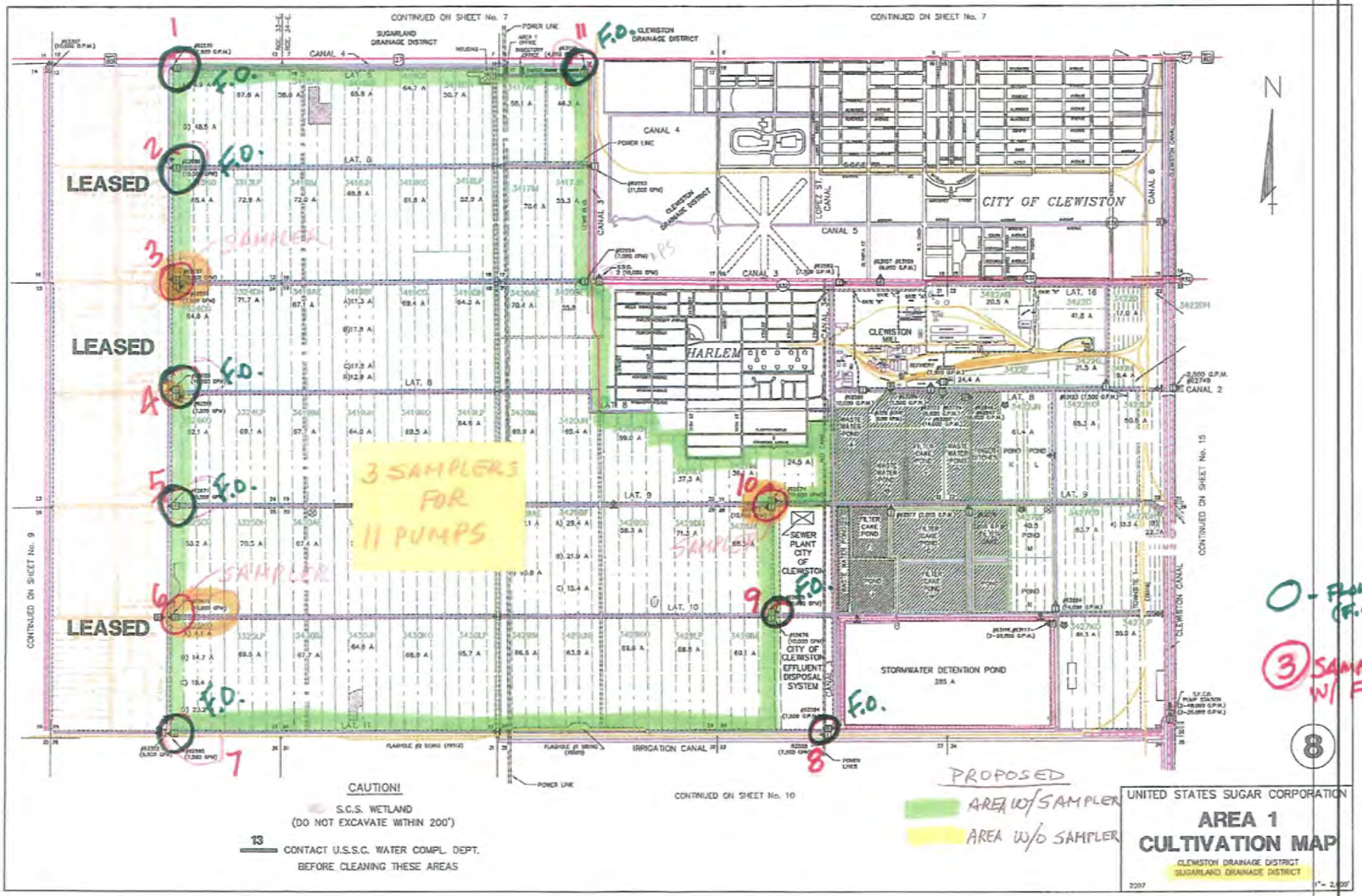
0 SAMPLERS w/ FLOW


CITY OF MOORE HAVEN
HICPOCHEE
MAIN CANAL
RANGE 33-E.
CONTINUED ON SHEET No. 5
CONTINUED ON SHEET No. 1
CONTINUED TOP RIGHT
CONTINUED BOTTON LEFT
CONTINUED ON SHEET No. 5
NINE MILE CANAL
TWP 42-S
TWP 43-S
LEASED
NO
N
4
UNITED STATES SUGAR CORPORATION
AREA 1
EL RODEO/HICPOCHEE
CULTIVATION MAP
DISSTON ISLAND CONSERVANCY DISTRICT
2007
O SAMPLER W/ FLOW


LAKE OKEECHOBEE
BENSON VILLAGE
U.S.C.O.E. LEVEE
PUMP CANAL 2
S.C.F.E. RR.
CONTINUED ON SHEET No. 4
CONTINUED ON SHEET No. 9
CONTINUED ON SHEET No. 6
J.E. FRIERSON
NURSERY
TREE
LEASED
N.O.
1 & 2
1
2
NO SAMPLERS NORTH OF RAILROAD
2 SAMPLERS w/ FLOW
SAMPLER
FLOW
PROPOSED
AREAS WITH SAMPLER
AREAS WITHOUT SAMPLER
4 mile Canal
N
5
UNITED STATES SUGAR CORPORATION
AREA 1
CULTIVATION MAP
DISSTON ISLAND CONSERVANCY DISTRICT


NOTE: SEE SHEET 5N FOR REPRESENTATIVE FLOW & SAMPLING SITES
AREA WITHOUT SAMPLER
NO SAMPLERS. WATER IS MIXED WITH N.O. LANDS
LEASED
N.O.
1 & 2
J.E. FRIERSON
PUMP CANAL
MAIN CANAL
SHAWNEE FARMS
LAKE OKEECHOBEE
LAT. 13
LAT. 14
LAT. 15
LAT. 16
LAT. 17
LAT. 18
LAT. 19
LAT. 20
LAT. 21
OLD C.O.D. LEVEE
U.S.C.O.S. LEVEE
CONTINUED ON SHEET No. 5
CONTINUED ON SHEET No. 7
GLADES
HENDRY
COUNTY
COUNTY
6
UNITED STATES SUGAR CORPORATION
AREA 1
CULTIVATION MAP
DISSTON ISLAND CONSERVANCY DISTRICT
2007
1" = 2,000'


CONTINUED ON SHEET No. 6
GLADES COUNTY
HENDRY COUNTY
LAT. 21
LAT. 22
LAT. 23
CANAL 19
CANAL 17
NINE MILE CANAL
DISSTON ISLAND CONSERVANCY DISTRICT
SUGARLAND DRAINAGE DISTRICT
SUGARLAND D. D. DISCHARGE CANAL
C-20
C-21
CANAL 21
LAKE OKEECHOBEE
U.S.C.O.E. LEVEE
C-2
HURRICANE GATE S-310
BOAT RAMP
CANAL 5
CANAL 4
WAL-MART
SUGARLAND HIGHWAY
CONTINUED ON SHEET No. 8
CANAL 6
CLEWISTON DRAINAGE DISTRICT
LOPEZ ST. CANAL
CITY OF CLEWISTON
CONTINUED BELOW LEFT
CONTINUED ON SHEET No. 8
NO SAMPLER IN CLEW. D.D.
1 SAMPLER
N
CAUTION!
S.C.S. WETLAND
(DO NOT EXCAVATE WITHIN 200')
DRAINAGE DISTRICT BOUNDARY
HURRICANE GATE
LAKE OKEECHOBEE
HENDRY COUNTY
PALM BEACH COUNTY
CONTINUED ABOVE RIGHT
CLEWISTON CANAL
LAT. 1
LAT. 2
LAT. 3
LAT. 4
LAT. 5
LAT. 6
MAIN CANAL
POND
ROCK PIT
SOUTH FLORIDA CONSERVANCY DISTRICT UNIT #5
DAVIDSON ROAD
CONTINUED ON SHEET No. 15
PROPOSED
AREA W/SAMPLER
AREA W/O SAMPLER
1 SAMPLER w/Flow
7
UNITED STATES SUGAR CORPORATION
AREA 1
CULTIVATION MAP
SOUTH FLORIDA CONSERVANCY DISTRICT UNIT #5
DISSTON ISLAND CONSERVANCY DISTRICT
SUGARLAND DRAINAGE DISTRICT
CLEWISTON DRAINAGE DISTRICT
2007
1"= 2,000'



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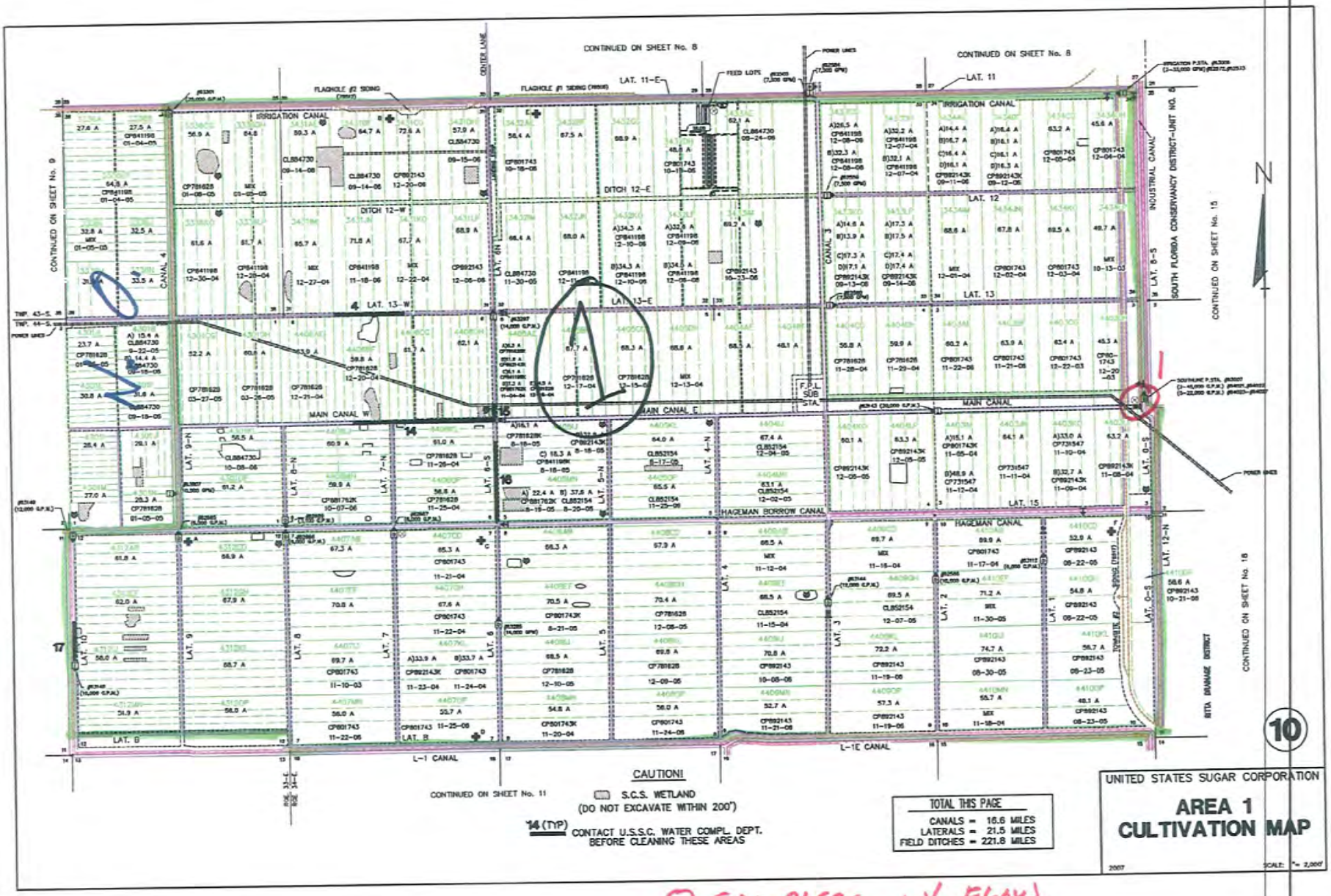

O SAMPLERS w/ FLOW

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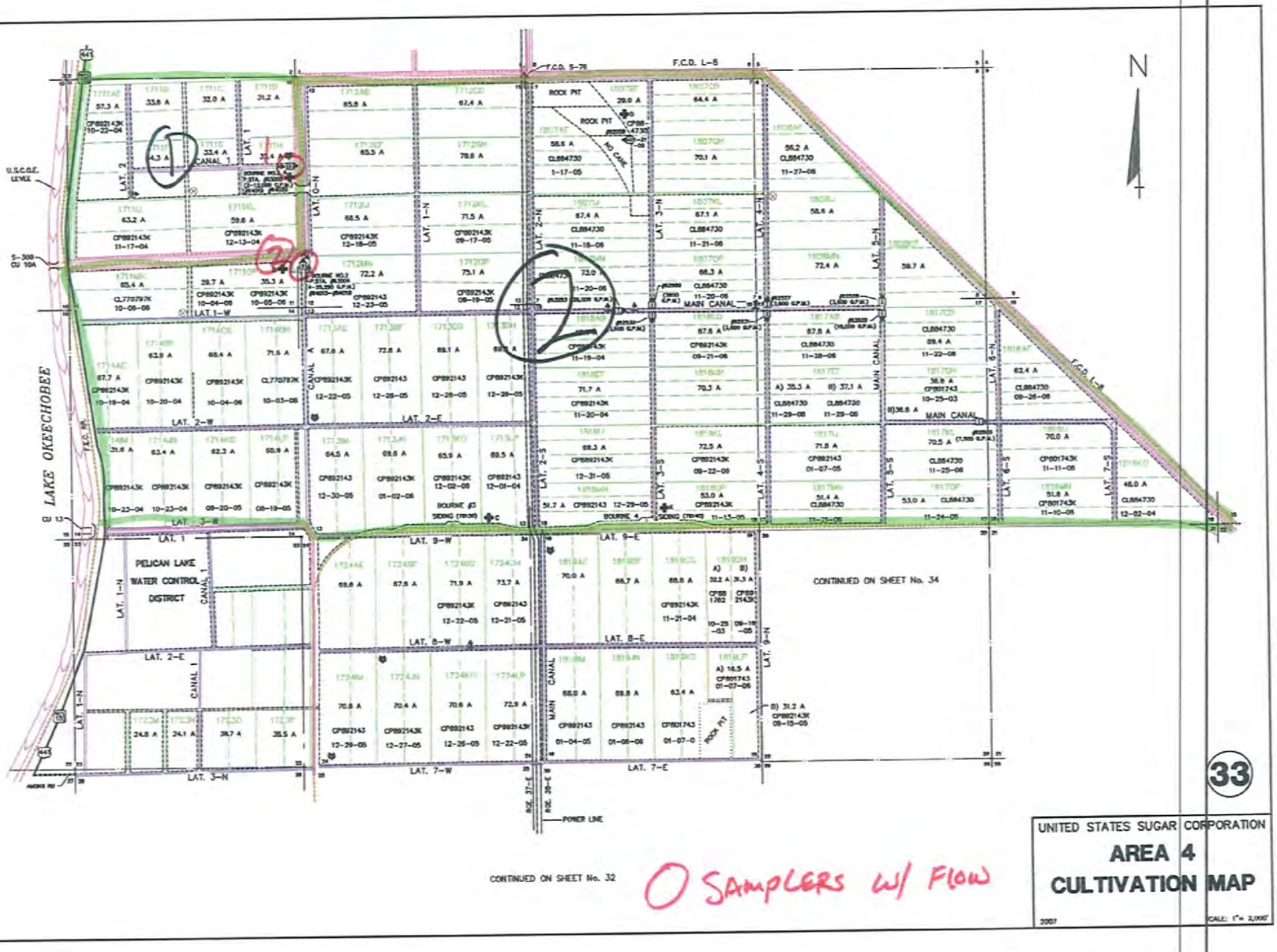
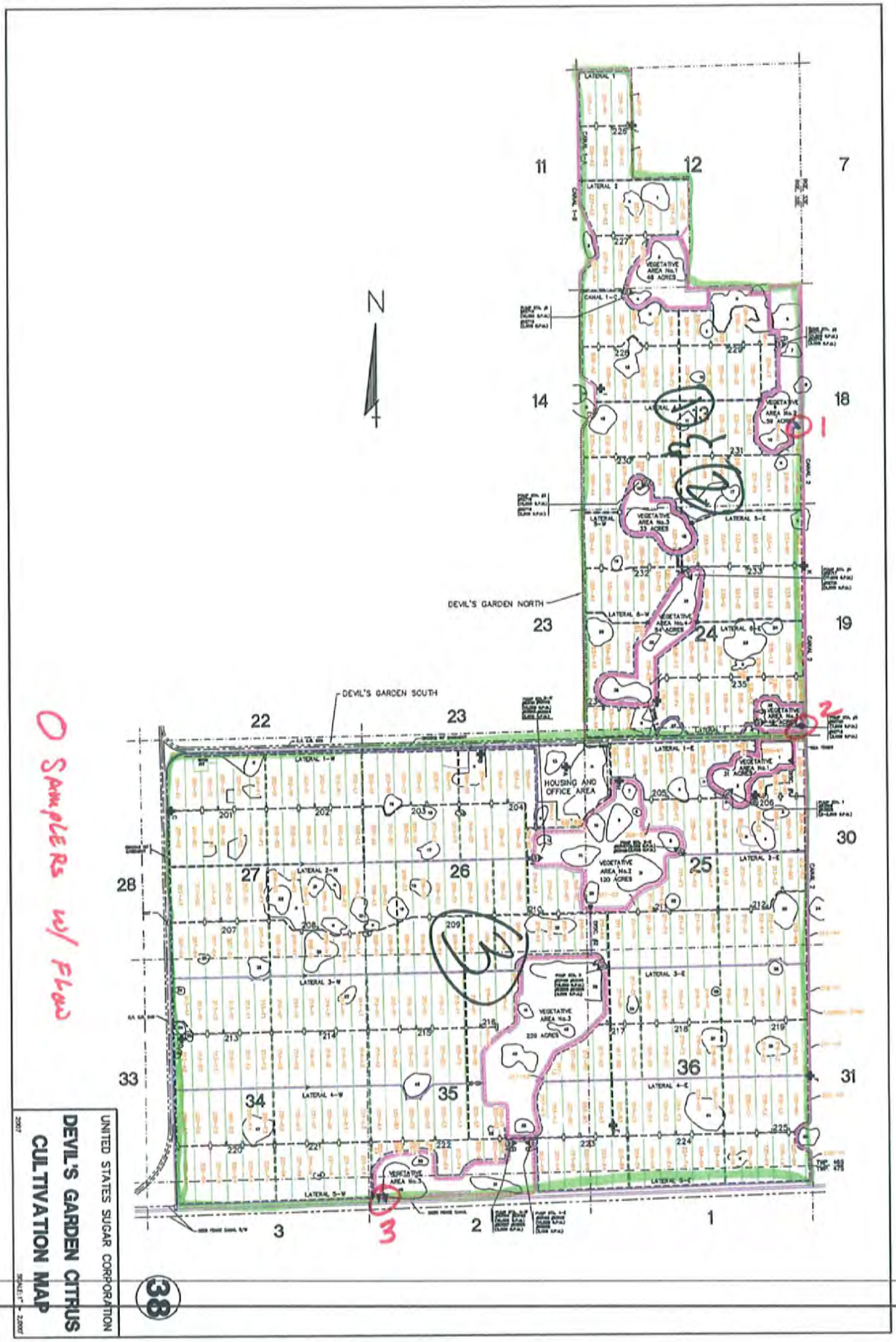
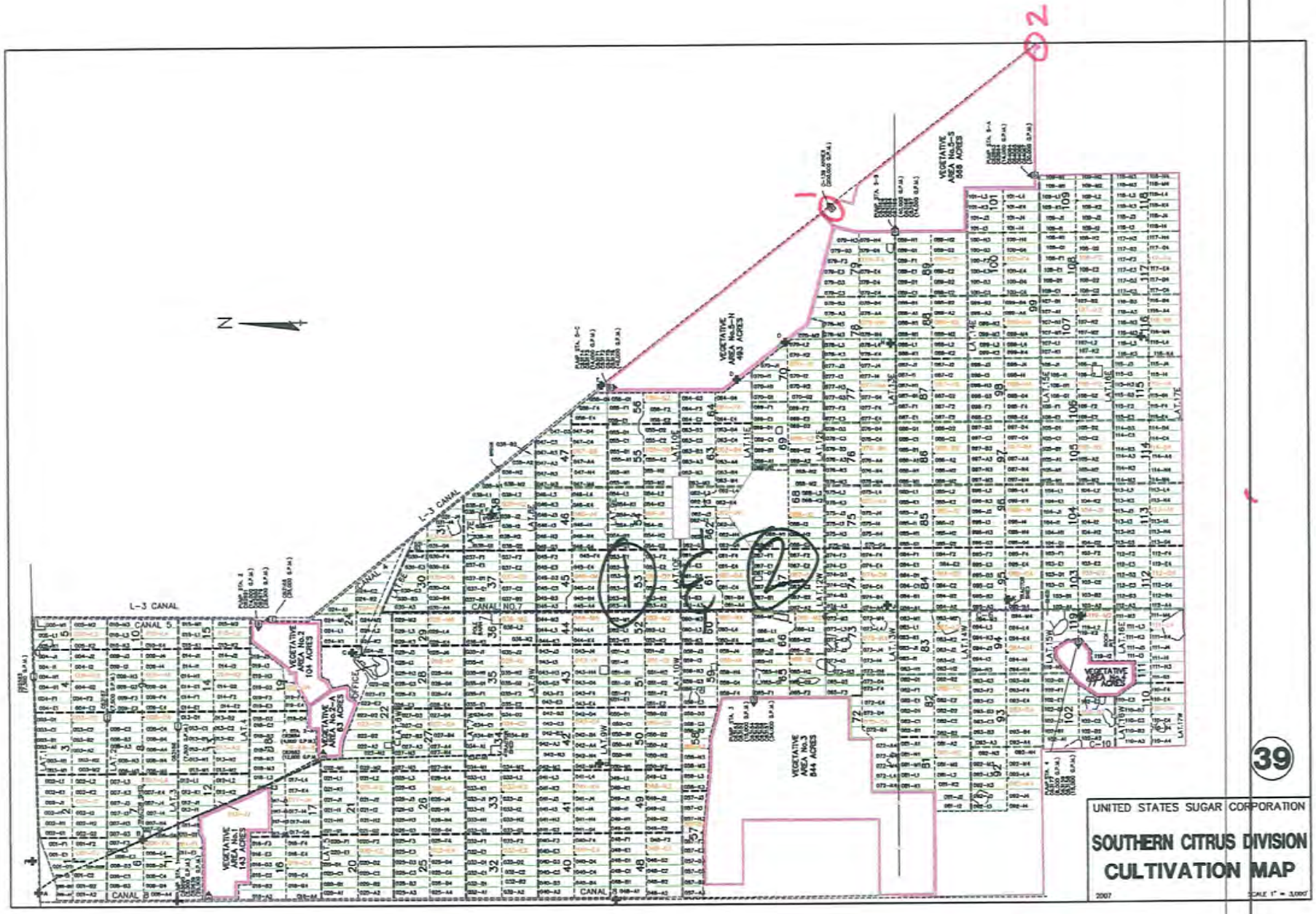

N
LAKE OKEECHOBEE
F.C.D. L-6
F.C.D. S-76
MAIN CANAL
PELICAN LAKE WATER CONTROL DISTRICT
CANAL 1
ROCK PIT
POWER LINE
CONTINUED ON SHEET No. 34
CONTINUED ON SHEET No. 32
O SAMPLERS W/ FLOW
UNITED STATES SUGAR CORPORATION
AREA 4
CULTIVATION MAP
2007
SCALE: 1" = 2,000'
33

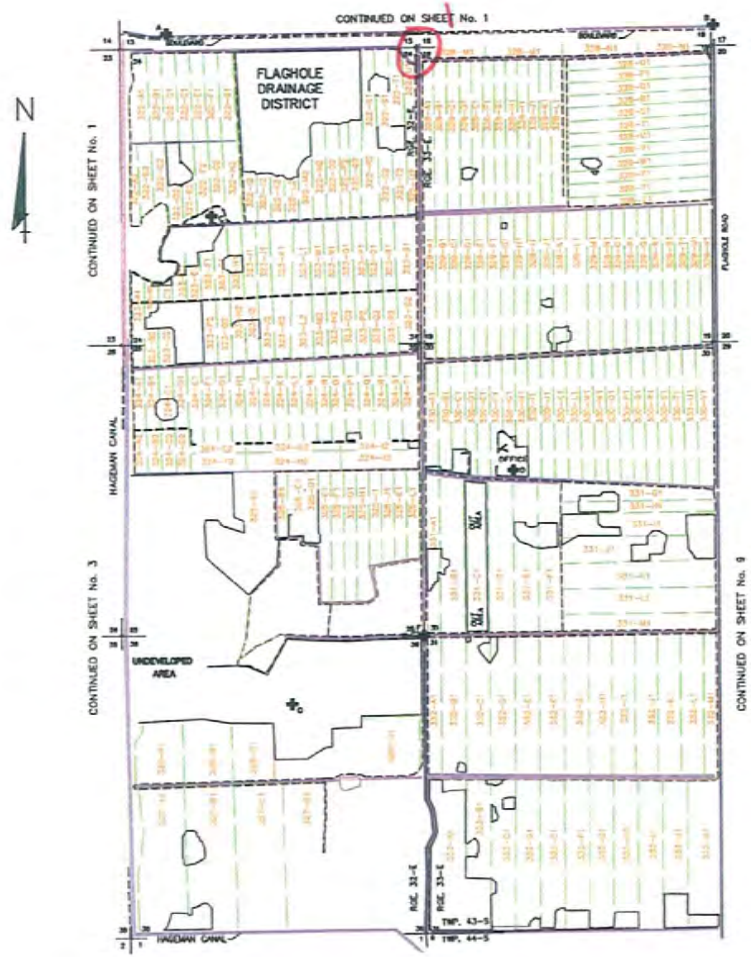


O Samples w/ Flow



O SAMPLERS w/ FLOW

ALCOMA CITRUS



O SAMPLER w/ FLOW

40

UNITED STATES SUGAR CORPORATION

ALCOMA CITRUS CULTIVATION MAP

FLAGHOLE DRAINAGE DISTRICT

2007 SCALE: 1"= 2,000'

EXHIBIT B TO SCHEDULE 3.1-B

Table 1. Summary of EAA USSC Sub-basin Discharges. (Historic Water Quality, 3-yr Targets and Limits, BMP Points and Associated Acreages)

UAID	Basin ID	Total WY08 Area acres	Historical Average 3-yr Discharges WY1999-2008 unless otherwise noted TP Conc ppb	Flow AF	TP Load kg	UAL #/ac	TP Targets 3-yr TP Conc ppb	3-yr UAL #/ac	Begin BMP Points	Existing TP Level Above Target?	First WQ Assess. Year	90% Conf. Level TP Limits 3-yr TP Conc ppb	3-yr UAL #/ac	90% Conf. Level Joint Exceed. Freq. Conc	UAL	Both	95% Conf. Level Annual Limit TP Conc ppb	Annual Limit UAL #/ac
S-5A Sub-basin																		
132	50-061-15	6,760	133	10,993	1,798	0.6	133	0.6	35	No	WY2013	181	0.9	0%	0%	0%	198	1.1
165	50-002-02	9,285	189	17,892	4,172	1.0	189	1.0	35	No	WY2013	218	1.2	33%	0%	33%	228	1.2
166	50-002-01	5,656	203	13,042	3,273	1.3	200*	1.2*	35	Yes	WY2013	N.I.	N.I.	N.I.	N.I.	N.I.	N.I.	N.I.
168	50-015-02	2,554	294	3,510	1,272	1.1	200*	1.2*	35	Yes	WY2013	N.I.	N.I.	N.I.	N.I.	N.I.	N.I.	N.I.
177	50-061-17	1,598	386	7,758	3,694	5.1	200*	1.2*	35	Yes	WY2013	N.I.	N.I.	N.I.	N.I.	N.I.	N.I.	N.I.
179	50-018-03	9,062	126	26,487	4,132	1.0	126	1.0	35	No	WY2013	136	1.2	17%	0%	17%	139	1.2
186	50-018-02	6,594	154	20,109	3,830	1.3	200*	1.2*	35	Yes	WY2013	N.I.	N.I.	N.I.	N.I.	N.I.	N.I.	N.I.
187	50-018-01	5,902	191	13,853	3,263	1.2	200*	1.2*	35	Yes	WY2013	N.I.	N.I.	N.I.	N.I.	N.I.	N.I.	N.I.
188	50-015-01	3,276	214	6,877	1,815	1.2	200*	1.2*	35	Yes	WY2013	N.I.	N.I.	N.I.	N.I.	N.I.	N.I.	N.I.
Sub-basin Sub-total		*50,689*	*183*	*120,521*	*27,248*	*1.2*								17%	0%	17%		
		Total USSC acreage in sub-basin			*40,445*	*Acreage @ 35 Points*	*40,445*											
						Acreage @ 25 Points	*0*											
S-6 Sub-basin																		
102	50-010-02	5,327	175	19,814	4,272	1.8	200*	1.2*	35	Yes	WY2013	N.I.	N.I.	N.I.	N.I.	N.I.	N.I.	N.I.
145	50-018-10	8,254	159	19,517	3,828	1.0	159	1.0	25	No	WY2010	202	1.5	0%	0%	0%	216	1.6
148	50-010-04	7,159	179	25,872	5,716	1.8	200*	1.2*	35	Yes	WY2013	N.I.	N.I.	N.I.	N.I.	N.I.	N.I.	N.I.
159	50-018-11	1,871	191	7,949	1,875	2.2	200*	1.2*	35	Yes	WY2013	N.I.	N.I.	N.I.	N.I.	N.I.	N.I.	N.I.
Sub-basin Sub-total		*22,612*	*174*	*73,152*	*15,691*	*1.5*								0%	0%	0%		
		Total USSC acreage in sub-basin			*13,496*	*Acreage @ 35 Points*	*8,569*											
						Acreage @ 25 Points	*4,927*											
S-7 Sub-basin																		
044	50-018-20	381	175	1,965	425	2.5	200*	1.2*	35	Yes	WY2013	N.I.	N.I.	N.I.	N.I.	N.I.	N.I.	N.I.
046	50-018-19	314	183	3,542	801	5.6	200*	1.2*	35	Yes	WY2013	N.I.	N.I.	N.I.	N.I.	N.I.	N.I.	N.I.
051	50-018-18	358	122	1,670	250	1.5	200*	1.2*	35	Yes	WY2013	N.I.	N.I.	N.I.	N.I.	N.I.	N.I.	N.I.
052	50-018-25	3,808	177	8,994	1,967	1.1	177	1.1	25	No	WY2010	204	1.4	0%	0%	0%	213	1.5
076	50-061-03	3,434	78	9,302	895	0.6	78	0.6	25	No	WY2010	98	0.7	17%	0%	17%	105	0.7
095	50-018-16	240	112	1,385	191	1.8	200*	1.2*	35	Yes	WY2013	N.I.	N.I.	N.I.	N.I.	N.I.	N.I.	N.I.
Sub-basin Sub-total		*8,535*	*137*	*26,857*	*4,530*	*1.2*								8%	0%	8%		
		Total USSC acreage in sub-basin			*6,813*	*Acreage @ 35 Points*	*1,032*											
						Acreage @ 25 Points	*5,781*											
S-8 Sub-basin																		
005	50-018-07	1,117	268	2,295	758	1.5	200*	1.2*	35	Yes	WY2013	N.I.	N.I.	N.I.	N.I.	N.I.	N.I.	N.I.
006	50-018-08	3,209	130	6,938	1,112	0.8	130	0.8	25	No	WY2010	200	1.4	17%	17%	17%	224	1.7
012	26-010-02	9,961	185	19,424	4,442	1.0	185	1.0	25	No	WY2010	265	1.5	0%	0%	0%	292	1.7
014	50-018-06	1,255	135	2,714	450	0.8	135	0.8	25	No	WY2010	176	1.3	0%	17%	17%	190	1.4
015	50-018-04	1,913	88	4,738	516	0.6	88	0.6	25	No	WY2010	98	0.9	17%	17%	33%	102	1.0
016	50-018-05	1,827	270	4,658	1,551	1.9	200*	1.2*	35	Yes	WY2013	N.I.	N.I.	N.I.	N.I.	N.I.	N.I.	N.I.
017	50-018-22	4,481	126	12,100	1,878	0.9	126	0.9	25	No	WY2010	148	1.3	17%	17%	17%	156	1.4
019	50-018-09	1,737	134	5,642	933	1.2	134	1.2	25	No	WY2010	152	1.8	17%	17%	17%	158	2.1
020	50-008-01	7,261	87	10,736	1,157	0.4	87	0.4	25	No	WY2010	106	0.5	17%	0%	17%	112	0.6
022	50-061-22	3,739	122	6,181	931	0.5	122	0.5	25	No	WY2010	130	1.0	0%	0%	0%	134	1.3
027	50-061-10	25,062	55	50,125	3,407	0.3	55	0.3	25	No	WY2010	71	0.4	0%	0%	0%	76	0.4
053	50-018-24	3,800	97	11,894	1,419	0.8	97	0.8	25	No	WY2010	112	1.2	17%	17%	17%	117	1.3
054	50-018-23	2,946	104	10,832	1,394	1.0	104	1.0	25	No	WY2010	134	1.6	17%	17%	17%	144	1.8
055	50-010-03	5,826	108	15,567	2,083	0.8	108	0.8	25	No	WY2010	140	1.1	0%	0%	0%	150	1.3
193	50-010-05	2,111	76	3,032	284	0.3	76	0.3	25	No	WY2010	98	0.5	17%	0%	17%	106	0.5
202	50-011-06	638	155	1,177	226	0.8	155	0.8	25	No	WY2010	213	1.4	33%	17%	33%	233	1.6
Sub-basin Sub-total		*76,885*	*109*	*168,052*	*22,540*	*0.6*								12%	10%	14%		
		Total USSC acreage in sub-basin			*55,194*	*Acreage @ 35 Points*	*2,114*											
						Acreage @ 25 Points	*53,080*											
Total EAA Basin		*158,721*	*146*	*388,583*	*70,009*	*1.0*								12%	7%	13%		
		Total USSC acreage in sub-basin			*115,948*	*Acreage @ 35 Points*	*52,160*											
						Acreage @ 25 Points	*63,788*											

Notes: * For those parcels showing "200*" and "1.2*" as the Targets, the performance goal is to continue improving performance until the maximum performance achievable has been demonstrated, or 200/1.2 has been achieved.

N.I. = Net Improvement

Basin ID 076 is leased by Duda Farms from USSC, and is not subject to the performance assessment provisions of Schedule 4.1.

Table 2. Summary of All Other USSC Basin Discharges. (Historic Water Quality, 3-yr Targets and Limits, BMP Points and Associated Acreages)

UAID	Basin ID	Total WY08 Area acres	Historical Average 3-yr Discharges WY1999-2008 unless otherwise noted TP Conc ppb	Flow AF	TP Load kg	UAL #/ac	TP Targets 3-yr TP Conc ppb	3-yr UAL #/ac	Begin BMP Points	Existing TP Level Above Target?	First WQ Assess. Year	90% Conf. Level TP Limits 3-yr TP Conc ppb	3-yr UAL #/ac	90% Conf. Level Joint Exceed. Freq. Conc	UAL	Both
EBWCD Sub-basin		6,574	440	19,624	10,652	3.6	200*	1.2*	35	Yes	WY2013	N.I.	N.I.	N.I.	N.I.	N.I.
		Total USSC acreage in basin			*55*	*Acreage @ 35 Points*		*55*								
ESWCD Sub-basin		8,324	128	14,905	2,344	0.6	128	0.6	25	No	WY2010	200	0.9	17%	17%	17%
		Total USSC acreage in basin			*5,287*	*Acreage @ 25 Points*		*5,287*								
SSDD Sub-basin		4,049	114	11,497	1,622	0.9	114	0.9	25	No	WY2010	139	1.3	17%	33%	33%
		Total USSC acreage in basin			*2,868*	*Acreage @ 25 Points*		*2,868*								
SFCD Sub-basin		11,080	114	27,604	3,898	0.8	114	0.8	25	No	WY2010	129	1.0	17%	0%	17%
		Total USSC acreage in basin			*7,940*	*Acreage @ 25 Points*		*7,940*								
L-8 Sub-basin		5,058	249	11,156	3,430	1.5	200*	1.2*	35	Yes	WY2013	N.I.	N.I.	N.I.	N.I.	N.I.
WY1996-2005		*Total USSC acreage in basin*			*5,058*	*Acreage @ 35 Points*		*5,058*								
C-139 Sub-basin		169,500	252	178,678	55,563	0.7	200*	1.2*	35	Yes	WY2013	N.I.	N.I.	N.I.	N.I.	N.I.
		Total USSC acreage in basin			*5,439*	*Acreage @ 35 Points*		*5,439*								
C-139 Ann. Sub-basin		17,841	100	42,946	5,274	0.7	100	0.7	35	No	WY2013	112	0.8	17%	0%	17%
		Total USSC acreage in basin			*17,841*	*Acreage @ 35 Points*		*17,841*								
S-4 East Sub-basin		19,917	255	43,886	13,818	1.5	200*	1.2*	35	Yes	WY2013	N.I.	N.I.	N.I.	N.I.	N.I.
WY1998-2007		*Total USSC acreage in basin*			*11,481*	*Acreage @ 35 Points*		*11,481*								
S-4 West Sub-basin		21,576	265	46,623	15,245	1.6	200*	1.2*	35	Yes	WY2013	N.I.	N.I.	N.I.	N.I.	N.I.
WY1998-2007		*Total USSC acreage in basin*			*6,990*	*Acreage @ 35 Points*		*6,990*								
Other runoff to C-43		23,900	265	51,645	16,887	1.6	200*	1.2*	35	Yes	WY2013	N.I.	N.I.			
Conc & UAL set equal to S-4 West		*Total USSC acreage in basin*			*8,131*	*Acreage @ 35 Points*		*8,131*								
Total non-EAA		***287,819***	***233***	***448,564***	***128,733***	***1.0***								17%	13%	21%
		Total USSC acreage in sub-basin			*71,090*	*Acreage @ 35 Points*		*54,995*								
						Acreage @ 25 Points		*16,095*								
Total Discharges		***446,540***	***192***	***837,146***	***198,742***	***1.0***								13%	8%	15%
			Total USSC acreage		*187,039*	*Acreage @ 35 Points*		*107,155*								
						Acreage @ 25 Points		*79,884*								

Notes: * For those parcels showing "200*" and "1.2*" as the Targets, the performance goal is to continue improving performance until the maximum performance achievable has been demonstrated, or 200/1.2 has been achieved.

N.I. = Net Improvement

Table 3. Initial Net Improvement Performance Measures for Basin IDs With Historical Discharges Above 200 ppb or 1.2 lb/acre

UAID	Basin ID	More Restrictive Parameter	Unit	Historical Value	20% Performance Improvement	Upper Performance Limit
S-5A Sub-basin						
166	50-002-01	UAL	lbs/acre	1.3	1.2	1.2
168	50-015-02	TP	ppb	294	235	264
177	50-061-17	UAL	lbs/acre	5.1	4.1	4.6
186	50-018-02	UAL	lbs/acre	1.3	1.2	1.2
187	50-018-01	UAL	lbs/acre	1.2	1.2	1.2
188	50-015-01	TP	ppb	214	200	207
S-6 Sub-basin						
102	50-010-02	UAL	lbs/acre	1.8	1.4	1.6
148	50-010-04	UAL	lbs/acre	1.8	1.4	1.6
159	50-018-11	UAL	lbs/acre	2.2	1.8	2.0
S-7 Sub-basin						
044	50-018-20	UAL	lbs/acre	2.5	2.0	2.2
046	50-018-19	UAL	lbs/acre	5.6	4.5	5.1
051	50-018-18	UAL	lbs/acre	1.5	1.2	1.4
095	50-018-16	UAL	lbs/acre	1.8	1.4	1.6
S-8 Sub-basin						
005	50-018-07	TP	ppb	268	214	241
016	50-018-05	TP	ppb	270	216	243
EBWCD Sub-basin		UAL	lbs/acre	3.6	2.9	3.2
L-8 Sub-basin		TP	ppb	249	200	225
C-139 Sub-basin		TP	ppb	252	202	227
S-4 East Sub-basin		TP	ppb	255	204	230
S-4 West Sub-basin		TP	ppb	265	212	239

Note:
1) UAL – TP Unit Area Load (lbs/acre)
2) TP – Flow-weighted mean TP concentration (ppb)

Table 4. Annual Basin Rainfall and Maximum Value; values in inches per year.

Basin	WY1999	WY2000	WY2001	WY2002	WY2003	WY2004	WY2005	WY2006	WY2007	WY2008	Max	Rainfall Station
S-5A	42.22	60.12	37.60	52.09	50.27	50.17	56.66	42.93	37.33	44.18	60.12	Rule 40E-63
S-6	41.88	54.32	35.09	54.37	46.04	46.37	50.26	44.32	39.04	53.27	54.37	Rule 40E-63
S-7	41.43	59.04	38.21	49.51	44.19	43.91	44.87	51.96	40.40	50.38	59.04	Rule 40E-63
S-8	45.49	56.57	37.04	43.69	44.19	46.12	49.11	56.42	35.22	44.09	56.57	Rule 40E-63
EBWCD	26.49	37.37	21.48	25.51	33.63	33.32	39.36	29.29	24.83	47.14	47.14	DBKEYs 5962, 16191, 5835
ESWCD	26.17	40.48	28.11	30.24	37.36	31.77	44.23	38.67	25.36	47.80	47.80	DBKEYs 16191, 5835
SSDD	42.93	51.33	37.02	43.67	36.15	43.36	51.52	58.43	30.06	36.74	58.43	DBKEYs 15199, 15198
SFCD	48.73	55.68	27.68	33.99	44.11	45.85	66.17	64.19	37.71	38.12	66.17	DBKEYs 15198, 5965, 16696
L-8 (WY96-05)	53.69	39.75	40.90	28.22	47.43	27.05	35.44	33.02	35.09	49.24	53.69	S-352 (DBKEY 16693)
C-139	51.92	54.46	35.70	54.23	55.40	49.90	50.68	54.86	36.85	41.95	55.40	Rule 40E-63
C-139 Annex	42.45	58.46	42.39	48.85	52.54	53.96	51.14	59.73	50.70	49.11	59.73	DBKEYs 16224, 16606, 15685
S-4 East (WY98-07)	50.10	46.60	60.30	27.10	49.90	46.60	47.90	61.40	63.00	36.60	63.00	Clewiston F.S. (DBKEY 16696)
S-4 West (WY98-07)	50.10	46.60	60.30	27.10	49.90	46.60	47.90	61.40	63.00	36.60	63.00	Clewiston F.S. (DBKEY 16696)
Other C-43	50.10	46.60	60.30	27.10	49.90	46.60	47.90	61.40	63.00	36.60	63.00	Clewiston F.S. (DBKEY 16696)

Figure 1. Flow Chart for Annual Performance Assessment of USSC Basin IDs With Historical Discharges Below 200 ppb and 1.2 lb/acre

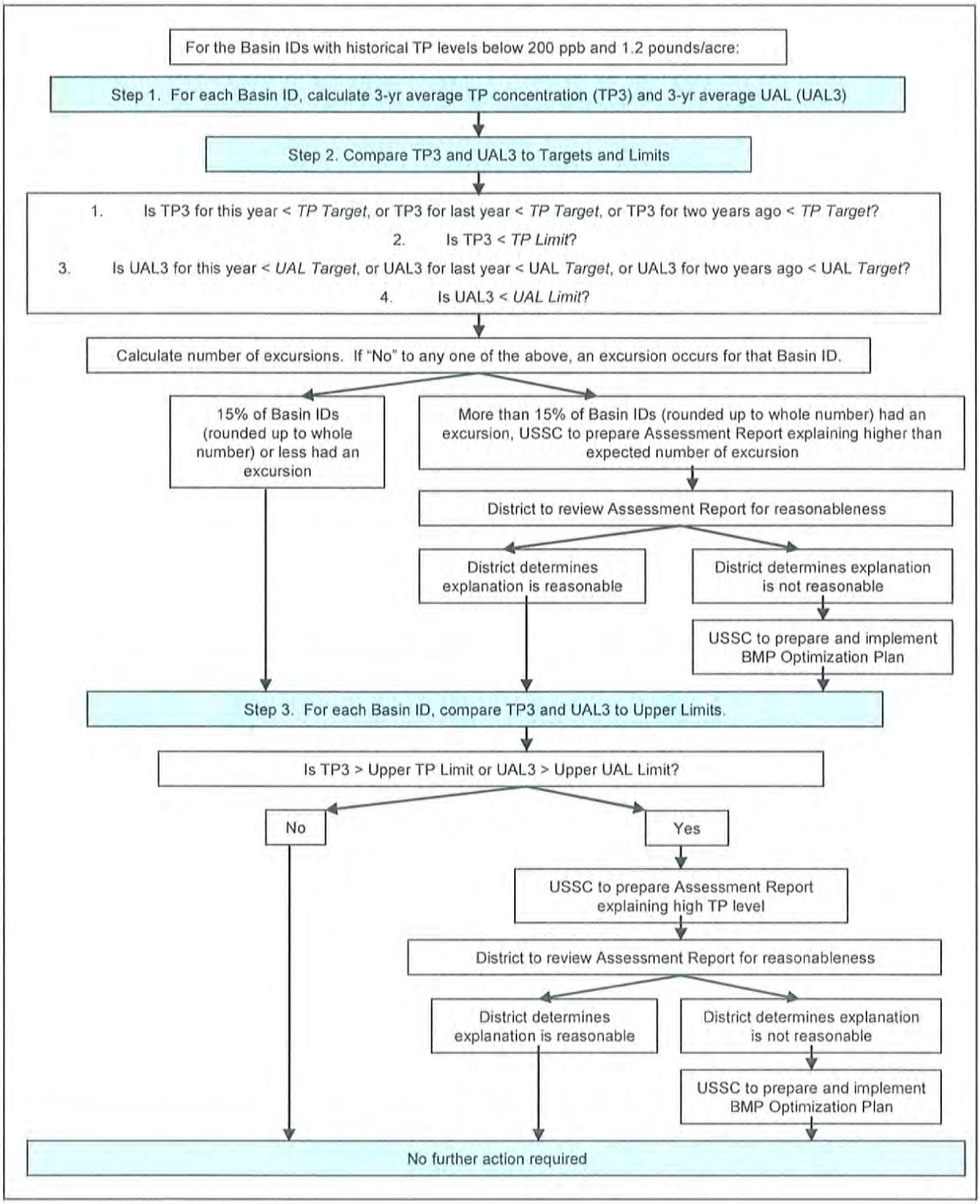


Figure 2. Flow Chart for Annual Performance Assessment of USSC Basin IDs With Historical Discharges Above 200 ppb or 1.2 lb/acre

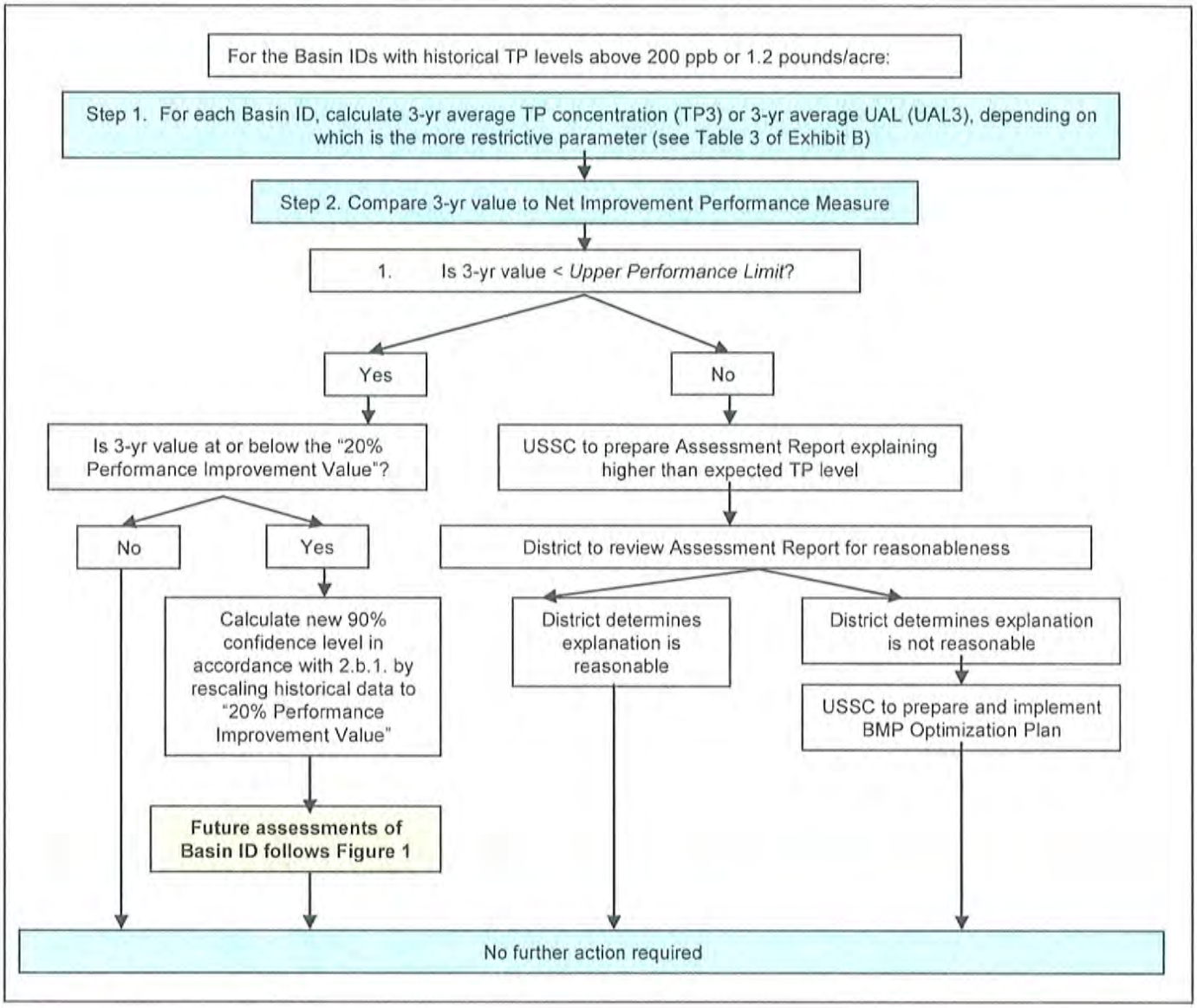


EXHIBIT C TO SCHEDULE 3.1-B

[THIS EXHIBIT IS IN ELECTRONIC FORMAT – SEE ENCLOSED COMPUTER DISK IN THE POCKET ATTACHED HERETO.]

SCHEDULE 3.2-A

DRAFT REPORT
BEST MANAGEMENT PRACTICES PLAN
SUGAR CANE PRODUCTION

UNITED STATES SUGAR CORPORATION
PALM BEACH, HENDRY, AND GLADES COUNTIES, FLORIDA

Prepared for

South Florida Water Management District
3301 Gun Club Road
West Palm Beach, Florida 33406

May 8, 2009

Prepared by

URS Corporation
7800 Congress Avenue, Suite 200
Boca Raton, Florida 33487

URS

May 8, 2009

Mr. Robert Taylor
Lead Environmental Engineering Specialist
Land Management and Land Acquisition Division
South Florida Water Management District
3301 Gun Club Road
West Palm Beach, Florida 33406

Subject: **Environmental Best Management Practices Plan-Sugar Cane Production**
United States Sugar Corporation
Palm Beach, Hendry, and Glades Counties
State of Florida
Job # 38617-027

Dear Mr. Taylor,

URS Corporation (URS) is pleased to present this Environmental Best management Practices (BMP) Plan for the United States Sugar Corporation (USSC) sugar cane production properties in Palm Beach, Hendry, and Glades Counties, Florida.

It is URS' understanding that as the property owner, the South Florida Water Management District (District) desires to have in place a set of general environmental BMP's for the sugar cane operations that are designed to maintain/protect water quality in accordance with the State's water quality standards, maintain the soil and water quality at the site which will not prohibit the District from using property as a water attenuation reservoir in the near future, and that will concurrently allow for continued economically-viable agricultural production on the site. This BMP plan is designed to meet these expectations by providing guidance to the USSC property on environmental preventative measures to be proactively implemented.

Sincerely,
URS Corporation

Edward A. Leding, P.G.
Project Manager

Timothy B. DeBord
Vice President
URS Jacksonville

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1.0 OVERVIEW

1.1 BACKGROUND

The South Florida Water Management District (District) has acquired approximately 72,500 acres of the United States Sugar Corporation (USSC) properties in Palm Beach, Hendry, and Glades Counties, Florida for future restoration purposes such as water storage reservoirs and wetlands. **Figure 1** illustrates the USSC properties. Of the 72,500 acres, an estimated 40,500 acres is used for the cultivation of sugar cane. **Figure 2** illustrates the tracts of land in eastern Glades, eastern Hendry, and Palm Beach Counties that are utilized for the cultivation of sugar cane. Additionally, portions of the 40,500 acres are subleased each year for the cultivation of vegetables. The vegetables that are typically grown are corn, beans, and watermelons. This Environmental Best Management Practices (BMP) Plan shall be implemented by future tenants of the District that engage in sugar cane and vegetable production on portions of the acquired properties.

During the interim period (from acquisition to construction/land conversion), the District intends to utilize the property for continued agricultural operations primarily for the cultivation of sugar cane. In general, this BMP requirements document is not regulatory or enforcement based (as opposed to any existing or future permit that may contain BMP requirements); however, failure of a tenant to implement this BMP Plan will constitute a breach of the tenant's lease with the District. BMPs are production systems and management strategies scientifically shown to minimize adverse water quality and other environmental impacts of sugar cane production. BMPs can be defined as those operational procedures designed to achieve greatest agronomic efficiency in food and fiber production, while limiting the off-site effects of agricultural operations and maintaining an economically viable farming operation. All BMPs must protect the environment and be economically viable. A small percentage of the 40,500 acres, an estimated 2% to 4%, is used for vegetable growing as part of the sugar cane crop rotation. These acres are subleased to independent farmers who grow the vegetables. In the event that USSC plans to sub-lease large portions/substantial additional acres for vegetables or other crops not associated with the typical crop rotation, the District must be notified prior to leasing the acreage. It will be the District's lessee's responsibility to insure that its sub-tenant complies with the BMP Plan.

There are several sources of research that have been used to develop BMPs for sugar cane production in Florida. Primary sources include the United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS), University of Florida/Institute of Food and Agricultural Sciences (IFAS), Environmental Protection Agency (EPA), Florida Department of Environmental Protection (FDEP), and Florida Department of Agriculture and Consumer Services (FDACS). This document cites pertinent documentation from these sources that may guide the implementation, evaluation, verification and validation of each BMP.

The proposed acquisition areas have been cultivated since the 1920s. Initially vegetables were cultivated. Beginning in the 1930s, the predominant crop was sugar cane. Maintenance buildings with chemical storage areas are strategically spaced throughout the acquisition areas, as well as diesel powered pump stations and re-fueling areas. A railway system located throughout the properties is used to transport the sugar cane to the mills. Rail sidings, which are used to load the harvested sugar cane onto rail cars, are strategically placed along the railway system. Agrochemical application is conducted using mobile

equipment and also applied aerially, and the agrochemicals are stored in designated areas at the maintenance buildings. For tracts that are leased for vegetable cultivation, the agrochemicals are stored off-site and transported to the vegetable growing are on an as-need basis. USSG property personnel indicated there have been no central burn pits and the paper, boxes and cartons generated as part of the farming operations were burned in many small areas throughout the properties. Agricultural air strips are located on several properties.

1.2 ENVIRONMENTAL SITE ASSESSMENT (ESA)

Phase I and Phase II Environmental Site Assessment (ESA) activities were conducted on the property in August and September 2008 by Professional Services Inc. (PSI). Identified areas of potential point sources associated with the sugar cane operation are primarily:

- Chemical Storage and/or Maintenance Areas
- Airplane Landing Strips
- Equipment Staging Areas
- Diesel Powered Pump Stations
- Fuel Storage / Re-Fueling Areas

Section 2.0 provides descriptions of a variety of environmental BMPs as part of the sugar cane and vegetable operations. Although all BMPs are important with the need for diligent on-going implementation, particular attention needs to be addressed to the following:

- Pump Stations
- Chemical Storage Areas
- Copper Based Nutrients

Given below is a summary of the observations made during the Phase I ESA, as well as the results of the Phase II ESA at the above referenced areas/issues and URS' recommendations to address the issues.

- Diesel powered pump stations with aboveground storage tanks (ASTs) used to store diesel fuel were observed on the properties. The pump stations are used to control water in the cultivated fields. Soil staining and/or petroleum impacted soils were identified at most of the pump stations. **URS recommends implementing preventative measures for petroleum spills and diesel AST leaks. This should include repairing any leaks and use of absorbent material when leaks and/or spills occur. URS also recommends that site inspections be routinely conducted when the pump station(s) are in operation to verify the pump stations are being properly maintained and in compliance.**

- Chemical and equipment storage areas were observed on the properties. Areas of petroleum and agrochemical stained soil and stressed vegetation were observed at numerous chemical and equipment storage areas. **URS recommends improving housekeeping at the storage areas. This should include proper handling and storage of agrochemicals and use of absorbent at the equipment storage areas. URS also recommends monthly site inspections to verify the storage areas are being properly maintained.**

- During the Phase I ESA, PSI identified copper based nutrients from the USSC pesticide application records. Due to these copper based nutrients, PSI analyzed for copper in the sugar cane cultivation areas during the Phase II ESA. PSI divided the sugar cane cultivation area into 40-acre grids and sampled approximately 20% of these 40-acre grids that were historically and currently cultivated with sugar cane. An eight point composite sample was collected from each grid with each aliquot representing approximately 5-acres. All aliquots were collected from a depth of 0 to 6-inches bls using a stainless steel sample barrel. The Phase II ESA sampling identified areas of elevated copper in the sugar cane cultivation areas copper above the Service provisional Snail Kite threshold level of 85 milligrams per kilogram (mg/kg).

- Based on the PSI Phase II ESA sampling results, URS identified 17, 40-acre grids within the purchase area with copper concentrations ranging from 70 mg/kg to 85 mg/kg, and 48, 40-acre grids within the purchase area with copper concentrations above 85 mg/kg. The current rates of application and amounts of copper based nutrients that have been applied on the USSC property were reviewed. Utilizing this information, a mass balance equation was developed in order to determine if additional acreage would be impacted by copper based on the current application activities. URS determined that copper could potentially increase in the soils, per application, at a rate of 2.08 mg/kg per acre. Based on this application rate, and the fact that the property is leased through 2016, four, 40-acre grids have the potential to accumulate copper above the Service's interim value for copper of 85 mg/kg during the lease agreement. However, most of the four, 40-acre grids are located adjacent to soils with copper concentrations exceeding 85 mg/kg and/or are co-located with historically applied agrochemicals (organochlorine pesticides) that are targeted for abatement. **The current nutrient application regiment is acceptable over most areas. Based on the Phase II findings on elevated copper concentrations, no copper should be applied on the 1,920 acres. URS recommends sampling select areas within the cultivated fields every year in order to monitor the copper concentrations in the soil. Section 3 gives details of the sampling and compliance plan. In the event that USSC plans to increase the applications rate of the copper based nutrients, URS recommends that USSC discuss the application increase with the District prior to implementing.**

1.3 OBJECTIVE

Given below are sets of guidelines and requirements proposed for the day-to-day sugar cane farming operations:

- Continued economically-viable sugar cane operations on the properties that is agreeable for implementation by the lessee/tenant during the interim use,
- Maintain/protect water quality in accordance with the State's water quality standards; prevent exceedances of applicable State soil or groundwater Cleanup Target Levels (CTLs) as set forth in Tables 1 and 2 of 62-777, F.A.C.; and implement such measures as necessary to maintain existing levels of pollutants and not interfere with District's intent to use the premises as a future water resource project.
- Comply with State regulations that are applicable to the sugar cane operations that result in conditions that will maintain the soil and water quality at the site which will not prohibit the District from using the property as a water attenuation project area at the end of the interim use period.

- Comply with permits/consent agreements issued by the District approving the site specific BMP plan for Water Management, Nutrient Management and Fertilizing, and Erosion/Sediment Control and the Discharge Monitoring Plan for nutrients (phosphorus and nitrogen).

A list of agrochemicals currently used was provided to the District. The chemical usage list is included in *Section 2.6.1 Acceptable Agrochemicals and No Application Periods*. In the event that changes are made to the agrochemical list, a revised list should be provided to the District and should consist of a detailed specific agrochemical and pesticide product list, to include the quantity used, rates of application, and an evaluation of crop areas for effectiveness of the pesticides.

The U.S. Fish and Wildlife Service (Service) document titled "Derivation of No Application Periods for Interim Use Pesticides" defines the no application period as *the period of time prior to the conversion of the agricultural land to conservation purposes (i.e. flooding to create wetlands) during which a particular pesticide hazardous to fish and/or wildlife should not be applied, in order to allow adequate time for breakdown of pesticide residues before use of the land by the Service trust resources. This period of time was defined as five times the median half-life, representing 97 percent degradation.* A copy of this document is included in **Appendix A.**

1.4 STANDARDIZED BMP CHECKLIST

The District's intent is to ensure consistency of BMP implementation and future verifications on two levels:

1. Consistent BMP verification for each visit to the USSC properties; and,
2. Consistent BMP verification for site visits to similar land use operations.

In some cases, previously developed District and USSC BMP plans were earlier generation versions focused on addressing specific issue areas (i.e., phosphorous control) while possibly not addressing additional areas of the District's potential concern (i.e., petroleum management, chemical usage). In addition, there may be supplementary areas of common good management practices, such as general site condition housekeeping, that are to be included in all BMP site verifications.

An example of the Standardized *BMP Site Verification Findings Summary* checklist is provided in **Appendix B,** as a supplement to any previously developed site-specific BMP Plan. The checklist is intended to serve as an additional guide to prepare for BMP site verification by the District representatives. The checklist attempts to identify BMP verification aspects which will require field observations and verification aspects which will consist of records review.

The following matrix and equivalent points table provides a *quick-glance* summary of the BMPs established for the agricultural operation. Further discussion of each BMP and key points to assist with advance preparation of BMP site verification are provided in **Section 2**.

Best Management Practices Checklist

United States Sugar Corporation
Palm Beach, Hendry, and Glades Counties
State of Florida

BMP Group/BMP Name	Site Verification		Training & Communications
	Observations	Records	
GENERAL			
• *Education-Employee Training* • *Overall Operations 'Housekeeping'*	✓	✓	✓
EXOTIC VEGETATION CONTROL			
Upland Exotic Vegetation Control • *Control and eradicate to the extent practicable Category I and II exotic/invasive pest plants*	✓		✓
Aquatic Exotic Vegetation Control • *Control and eradicate to the extent practicable Class I and II prohibited aquatic plants*	✓		✓
EARTHWORK			
No unpermitted earthwork, excluding ditch and routine maintenance. All non-routine maintenance requires contacting the District for approval.	✓	✓	✓
PESTICIDE & HERBICIDE MANAGEMENT			
Allowable agrochemical list and *No Application Period*		✓	✓
Pesticide & Herbicide Management • *Pesticide record keeping* • *Read and understand label* • *Pesticide storage*		✓	✓
Pesticide & Herbicide Application Optimization • *Integrated pest management* • *Application timing* • *Customized applications* • *Maintain soil pH in optimum range* • *Pesticide selection*	✓		✓
Pesticide & Herbicide Handling and Placement • *Reduce spray drift* • *Equipment calibration and maintenance* • *Pesticide spill management* • *Pesticide application equipment wash water* • *Prevent backflow to water sources* • *Mixing and loading activity locations* • *Pesticide container management* • *Excess pesticide mixture* • *Excess formulation (raw product)*	✓		✓
COPPER			
Minimize Use of Copper	✓	✓	✓
PETROLEUM & HAZARDOUS WASTE MANEGEMENT			
Gasoline and Diesel Fuel Storage & Containment • *Site equipment* • *Fuel delivery*	✓		✓

BMP Group/BMP Name	Site Verification		Training & Communications
	Observations	Records	
Farm Equipment Cleaning and Maintenance • *General equipment cleaning* • *Solvents and degreasers* • *Paint* • *Used oil, coolant and lead-acid batteries*	✓		✓

Nutrient (Phosphorus and Nitrogen) Load Reduction Best Management Practices
BMP Description and Equivalent Points Reference Table

As provided in **Schedule 3.1**, a separate District-approved BMP Plan is required for each land use or crop for nutrient (phosphorus and nitrogen) load reduction. BMP Plans shall be implemented across the entire farm acreage (drainage area) with individual BMPs consistently implemented during the water year across each land use (crop) area, including temporary, rotational, and cover crops (e.g., corn, watermelons, vegetables) The BMP Plans shall include BMPs from the following categories: water management, nutrient control practices, and particulate matter and sediment controls. Nutrient control practices at a minimum shall include spill prevention, soil testing, and fertilizer application control. The table below provides an array of Nutrient BMPs available for selection by operators. However, operators may propose other Nutrient BMPs to meet the minimum required BMP equivalent points for review and approval by the District.

BMP	PTS	DESCRIPTION
NUTRIENT CONTROL PRACTICES		MINIMIZES THE MOVEMENT OF NUTRIENTS OFF-SITE BY ENSURING RECOMMENDED APPLICATION RATES AND CONTROLLED PLACEMENT OF APPLICATION
Nutrient Application Control	2 ½	Uniform and controlled boundary application of nutrients with a minimum 4' setback from canals with no overlapping application for each application method (e.g. banding at the root zone or side-dressing, pneumatic controlled-edge application such as AIRMAX); fertilization through low volume irrigation system applied at root zone (fertigation); controlled placement by fertilization under plastic near root.
Nutrient Spill Prevention	2 ½	Formal spill prevention protocols (storage, handling, transfer, and education/instruction).
Manage Successive Vegetable Planting to Minimize Phosphorous (P)	2 ½	Avoid successive planting of vegetables or other crops having high P needs to avoid P build up in soils. Includes successive planting with no successive P application.
Recommended Nutrient Application based on Plant Tissue Analysis	2 ½ 5	Avoid excess application of P by determining plant nutrient requirements for adjustments during next growing season (crop specific). Pastures with Bahiagrass – Plant tissue analysis along with soil test is required to make nutrient application recommendation.
Recommended Nutrient Application based on Soil Testing	5	Avoid excess nutrient application by determining P requirements of soil and follow standard recommendations for application rates (crop specific).
Split Nutrient Application	5	More efficient plant uptake of P by applying small portions of total recommended P at various times during the growing season. Not to exceed total recommendation based on soil test.

Slow Release P Fertilizer	5	Avoid flushing excess P from soil by using specially treated fertilizer that releases P to the plant over time.
Reduce P Fertilization	5	Reduce the P application rate by at least 30% below standard recommendations based on soil tests and development of site –specific (optimized) recommendations or application methods. Provide basis for reduction credit.
No Nutrients Imported Via Direct Land Application	20	No Application of P, in any form, to the soil for amendments or plant nutrients. (Native and Semi-improved Range can claim this BMP and still apply fertilizer at maintenance, or less than optimum production levels, as a grass supplement every 6-8 years.)
No Nutrients Imported Indirectly Through Cattle Feed	15	No P import to the basin through cattle feed (note: only native range can use mineral supplements or molasses and still meet this BMP)
Nutrient Management Plan	5 - 25	Managing the amount, source, placement, form, and timing of the application of nutrients on lands with cattle operations. See Rule 40E-63.402 (2)

BMP	PTS	DESCRIPTION
WATER MANAGEMENT PRACTICES		MINIMIZES THE QUANTITY OF OFF-SITE DISCHARGES WHICH CARRY NUTRIENTS DOWNSTREAM
½ Inch Detained 1 Inch Detained	5 10	Delayed discharge (based on measuring daily rain events using a rain gage).
Improvements to Water Management System Infrastructure to Further Increase Water Quality Treatment by Delayed or Minimized Discharge	5	Recirculation of water inside farm boundaries to improve WQ prior to off-site discharge, includes: fallow field flood water with no direct discharge (instead allow to "drain" via evapotranspiration, seepage, use as irrigation water); or Increasing water detention using properly constructed canal berms.
Low Volume Irrigation	5	Use of low volume irrigation methods, e.g. drip irrigation, microjet irrigation.
Approved and Operational Surface Water Reservoir (Fully Certified)*	20	Properly permitted, constructed and maintained storage system meeting specified Environmental Resource Permit (ERP) Basis of Review criteria (version in effect at the time of permitting or in effect at the time of permit modification for modified systems).
Temporary Holding Pond	15	Temporary agricultural activities (as described in Chapter 40E-400, FAC.) with a properly constructed and permitted temporary holding pond.
Overland Sheet Flow Over Entire Property	15	No drainage improvements made to property so that property drains through overland sheet flow, or drainage improvements such as ditches have been removed to restore overland sheet flow drainage to the property.
No Point Discharge of Surface Water	15	Voluntarily disabling of drainage or implementation of other permanent means to prevent point discharge.
Tailwater Recovery System	10	A planned irrigation system in which facilities have been installed and the system is operated to collect, store, and transport irrigation tailwater and/or rainfall runoff that would have been discharged offsite without the system.
Precision Irrigation Scheduling	10	Combination of soil-moisture measuring equipment, specialized irrigation decision tools (e.g. computer software), and/or remote sensing tools to ascertain real-time crop needs to maximize irrigation system performance and to develop precise irrigation scheduling (time, location and amount).

*Surface water reservoir certification refers to a construction completion certification by a Florida licensed Professional Engineer as required in Chapter 40E-4, F.A.C., using Form 0881A for projects permitted after October 3, 1995, and Form 0881B for projects permitted prior to October 3, 1995, or the current certification requirements of Chapter 40E-4, F.A.C. (except where not required by existing permits).

BMP	PTS	DESCRIPTION
PARTICULATE MATTER AND SEDIMENT CONTROLS		MINIMIZES THE MOVEMENT OF P, IN PARTICULATE MATTER AND SEDIMENTS, OFF-SITE BY CONTROLLING THE AMOUNT OF ERODED SOIL AND PLANT MATTER IN DISCHARGE
Any 2 Any 4 Any 6 Any 8	2 ½ 5 10 15	• erosion control by leveling fields • reduce soil erosion using grassed swales and field ditch connections to laterals • minimize sediment transport with slow velocity in main canal near discharge structure • minimize sediment transport into canals by constructing ditch bank berms • minimize sediment build-up through a canal cleaning program • reduce sediments transported offsite by using field ditch drainage sumps • minimize sediment transport with slow field ditch drainage near pumps/structure • reduce sediments transported offsite by maintaining a sediment sump/trap upstream of drainage structure • reduce sediment transport through the use of grassed waterways • reduce sediment transport through the use of filter strips or riparian buffers adjacent to waterways. No P is applied to these areas. • reduce sediments transported offsite by raising culvert bottoms above all ditch bottoms to minimize sediment transport • reduce sediments transported offsite by stabilizing soil through infrastructure improvements at canal/ditch intersections (e.g. flexible plastic pipe, polymer treatment) • maintain sustainable forage growth on pasture to reduce soil erosion/range seedings • reduce soil erosion with constructed ditch bank stabilization • reduce soil erosion with cover crops (not fertilized) • maintain vegetative cover in upland areas to reduce soil erosion • reduce soil erosion with vegetation on ditch banks • minimize P from plants by aquatic weed control (P source) at main discharge locations • reduce debris and aquatic plants (P source) leaving the site by using barriers at discharge locations

BMP	PTS	DESCRIPTION
PARTICULATE MATTER AND SEDIMENT CONTROLS FOR PASTURE MANAGEMENT		MINIMIZES NUTRIENTS IN DISCHARGES THROUGH ON SITE OPERATION AND MANAGEMENT PRACTICES
	2 ½	• restricted placement of stored feed and feeders to reduce "hot spots" near drainage ditches
	2 ½	• restricted placement of cowpens to reduce "hot spots" near drainage ditches
	2 ½	• restricted placement of water to reduce "hot spots" near drainage ditches
	2 ½	• provide shade structures to prevent cattle in waterways
	5	• low cattle density (1 head/2 acres, non-irrigated pasture)
	10	• restrict cattle from waterways through fencing of canals in a manner that protects water quality

2.0 BMP PLAN ELEMENTS AND SITE VERIFICATION GUIDELINES

2.1 GENERAL

2.1.1 Education - Employee Training

The singularly most important part of a BMP plan is the communication, education, and training of employees who will be responsible for its continual implementation on a daily basis.

In the event that obvious and excessive impacts are visibly detected during periodic site visits conducted by the District, a more comprehensive site-specific sampling plan that would depend on the magnitude of the impact should be developed under the direction of the District and applicable regulatory agencies. Many BMPs are good common sense practices which ultimately can produce a cost savings to the site operations, as well as, proactively preventing adverse water quality impacts. An integral part of the employee training should include an overview of the reasons for implementing BMPs as described earlier.

Implementation requirements include:

- Proper training of field operators responsible for handling, loading, and operating fertilizer and chemical application machinery and proper maintenance of field equipment can minimize the potential for misapplication of agriculture related chemicals.
- Training sessions can be formal or informal.
  - Once per year group meetings should be conducted to cover all the BMP topics: overall good housekeeping, water management, fertilizer (nutrient) controls, chemical handing and application, fuel, and equipment maintenance.
  - Frequent (weekly or bi-weekly) reminder sessions keep a more continual message with staff. Frequent meetings can be informal "start-of-day" 15-minute reminders with a different reminder topic referenced each session.
- The transfer of the information received during the required continuing education (such as spray applicator licensing) to the individual chemical application staff is essential.
- A standardized checklist of discussion points could be developed and utilized to ensure all staff are aware of the importance of proper handling and application of fertilizers and chemicals.
- Special efforts should be taken to ensure that non-English speaking field personnel understand proper handling, loading, and operating techniques.
- Record keeping of employee BMP training/communications can include maintaining an Employee Training Checklist such as example provided.

2.1.2 Good Housekeeping

Property infrastructure should be kept in an overall good and repaired condition. Any solid waste, trash and/or discarded equipment should be stored in appropriate areas pending offsite disposal. Equipment and facilities should be kept in a relatively neat and orderly fashion. Fence lines, gates, and signage should be kept in good and repaired condition.

Implementation requirements include:

- BMP implementation is verified by visual observations.

2.2 WATER MANAGEMENT

2.2.1 Minimize Property Over Drainage and Maximize Irrigation Efficiency

Potential movement of water quality constituents originating from fertilizers and agrochemicals is substantially related to irrigation and drainage water management. Irrigation mostly affects the movement of water soluble agrochemicals while drainage mostly affects the movement of chemicals absorbed on soil particles. The primary management objective is to minimize the over drainage of the property by the active control of the site water table.

Implementation requirements include:

- Site verification will include meetings with operation managers to understand property water management approach and visual observation of structures and tools used to assist with water management decisions. Observations will include:
  - Real-time weather monitoring to proactive manage or limit drainage and/or irrigation events.
  - Water management achieved through water control structures such as designed culvert sizes and openings or culverts with flashboard risers.
  - For off-site discharge, on/off control elevations shall be established to initiate and stop draining or pumping. USSC currently has on/off controls on structures that discharge into offsite canals.
  - Partition property into hydrologic blocks to allow for internal water management (as opposed to one location to downstream point) whenever possible.
  - Installed water level indicators (e.g., float wells, staff gauges) can provide a visual indicator of actual water table levels. U.S. Sugar has a water table monitoring system that is in compliance.
  - Daily operation and maintenance must be properly recorded on field logs ensuring that on/off control elevations are met for pumps discharging off site and to surface water impoundments if these elevations are established by the surface water or environmental resource permits. Field log data shall include water table elevations at pump start and stop times, and pump rpms. Daily rainfall data shall be collected at representative locations within the farm to ensure that the on/off control elevations are current with the runoff detention requirements established by the permit.
  - Site verification will include meetings with Tenant/Lessee to review property water management approach, records, and field observation of structures and tools used to assist with water management decisions.

2.3 NUTRIENT MANAGEMENT (FERTILIZING)

At a minimum, the nutrient management BMPs in the District-approved plan shall include spill prevention, soil testing, and fertilizer application control specific to phosphorus and nitrogen. Phosphorus fertilizer shall be applied at the root zone. Phosphorus application later in the growing season not applied at the root zone will require justification.

2.3.1 Nutrient Application Optimization

Fertilizers can be a significant source of adverse downstream water quality impacts contributing to algal blooms and stimulate growth of noxious plants in receiving water bodies. A comprehensive approach to optimize the amount of nutrients needed for proper vegetation health and productivity while at the same time having a proactive consciousness to minimize the risk to inadvertent potential off-site transport of nutrients is essential. Listed below are the various nutrient application BMP optimization efforts that can be identified in the site-specific BMP Plan:

- Maintain soil pH in optimum range
- Utilize Organic material soil amendments that have water quality benefits
- Appropriate use of other nutrient sources (i.e. non-commercially produced sludge, chicken manure, mill mud, wood chips, bagasse, molasses, etc) and formulations to prevent increased phosphorous and nitrogen loads in discharges off site
- Split fertilizer applications

Implementation requirements include:

- Site verification will include discussion with operation managers to understand the agricultural operation nutrient application optimization approach.
- Records must be available and reviewed to reinforce the implementation tools used to assist with nutrient management decisions. Records shall identify:
  - Areas tested
  - Testing methodology (soil)
  - Test results
  - Application recommendations
  - Application methods (fertigation, soil broadcast, topical spray, aerial, etc.)
  - Actual mixture/application rate applied
- Where actual fertilizer formula or quantity varies from soil test recommendations, notation shall be made to explain the logic for the variations.

All nutrient sampling conducted to insure compliance with the Nutrient Management Plan will be conducted by USSC.

Select soil and groundwater samples will be collected and analyzed for phosphorous and/or total nitrogen. The total nitrogen data will monitored over a 2 to 3 year period and be used to develop a baseline and determine what the background concentrations of total nitrogen are for the USSC properties. Based on the background levels as determined by this sampling, if total nitrogen levels increase over the establish background levels, then USSC and the District will review the application of nitrogen based nutrients.

2.3.2 Nutrient Handling and Placement

Fertilizers can be a significant source of adverse downstream water quality impacts contributing to algal blooms and stimulate growth of noxious plants in receiving water bodies. Proper storage of fertilizers is essential to prevent inadvertent transport of these materials to off-site waterways. Formal practices and protocols shall be established as to the handling and placement of fertilizer, storage and disposal of fertilizer containers, and fertilizer transfer on-site. Fertilizer spills shall be cleaned-up immediately. Listed below are the nutrient handling and placement BMPs for the USSC properties.

- Phosphorus fertilizer shall be applied at the root zone. Phosphorus application not applied at the root zone will require justification.
- Other fertilizers are applied by fertigation, banded, broadcast, topical spray, aerial, etc.
- Nutrients are to be applied only when necessary
- Proper Fertilizer storage (see below)
- Equipment calibration and maintenance must be timely and documented
- Appropriate Fertilizer loading sites (see below)
- Apply materials to target areas without overlapping application of fertilizer
- Avoid high leaching-potential situations
- Promptly recover spilled fertilizer
- Use backflow prevention devices
- Alternate loading operation sites

Implementation requirements include:

- Site verification will include discussion with operation managers to understand the agricultural operation nutrient handling and placement strategies. In addition, site inspections will be made to observe the following items:
  - Always store fertilizer in an area that is protected from rainfall and away from nearby ground and surface water and separately from solvents, fuels, and pesticides since many fertilizers are oxidants and can accelerate a fire.
  - Storage of dry bulk materials on a concrete or asphalt pad may be acceptable if the pad is adequately protected from rainfall and from water flowing across the pad.
  - Permanent liquid fertilizer tanks stored on impermeable surface curbed surfaces, and within secondary containment structures.
  - Bulk fertilizer transports and field loading located away from canal and ditches. Diligent care with plastic tarps and/or immediate clean-up (shovel) of dry material has been

shown to be effective.

- Random locations of field load fertilizer operations on site to prevent a buildup of nutrients in one location.
- Clean up spilled material immediately.
- Collected material may be applied as fertilizer.
- Collect dry material by shovel, vacuum, loader or wash down area to a containment basin specially designed to permit recovery and application of the wash water to the crop.
- Discharge of cleanup wash water to ditches or canals is strictly prohibited.

2.4 EXOTIC VEGETATION CONTROL

2.4.1 Upland Exotic Vegetation Control

The intent of this BMP is to control and eradicate to the extent practical, and prevent the infestation of Category I and Category II exotic/invasive pest plants and to minimize impacts on water quality. In particular for water quality, chemical control of mature aquatic vegetation may result in large amounts of labile particulate phosphorus levels from farms. Timing and selection of methods for aquatic vegetation control shall prevent generation of particulate phosphorus due to inappropriate aquatic vegetation control methods and disposal. Glyphosate based herbicide Rodeo may be spot applied on the aquatic vegetation, followed by removal of the dead vegetation. Excessive amounts of Rodeo application are not allowed.

Multiple control methods may employed to implement this BMP including:

- Physical control
- Biological control
- Chemical control

Implementation requirements include:

- Site verification will include discussion with operation managers to understand the agricultural operation upland exotic vegetation management approach.
- Site manager will maintain a simple map showing the general areas where exotic/invasive vegetation eradication activities are conducted on an annual basis.
- Visual observations will be conducted to verify exotic/invasive vegetation is being reasonably controlled.

2.4.2 Aquatic Exotic Vegetation Control

The intent of this BMP is to control and eradicate to the extent practicable, and prevent the infestation of Class I and Class II prohibited aquatic plants. Multiple control methods may be employed to implement this BMP including:

- Physical control

- Biological control
- Chemical control

Implementation requirements include:

- Site verification will include discussion with operation managers to understand the agricultural operation upland aquatic exotic vegetation management approach.
- Site manager will maintain a simple map showing the general areas where exotic/invasive aquatic vegetation eradication activities are conducted on an as need basis.
- Visual observations will be conducted to verify no or a minimal amount of prohibited aquatic plants are present.

2.5 EROSION/SEDIMENT CONTROL

It is estimated that approximately 50-75% of the nutrient and chemicals discharged in stormwater runoff are associated with particulates (muck particles, dirt, dust, plant vegetation, etc.). The minimization and prevention of erosion and particulate/muck/dirt transport from blocks, fields, ditches, and canals to drainage pump stations or discharge culverts can have a substantial positive effect in preventing the off-site transport of nutrients and chemicals that can cause adverse downstream water quality problems.

Implementation requirements include:

- Records will be kept identifying description and location of the erosion/sediment control BMPs and all the maintenance and operations conducted through the year to sustain the BMP's effectiveness.

A minimum of four (4) erosion/sediment control BMPs from the equivalent points reference table above will be implemented and maintained consistently throughout the site at all times.

2.6 PESTICIDE AND HERBICIDE MANAGEMENT

2.6.1 Allowable Agrochemical List and No Application Period

The presence of agrochemicals (particularly persistent pesticides) should be minimized so as to not cause adverse impacts to anticipated flora and fauna. As current landowner, the District must ensure that all application of agrochemicals on-site is conducted in accordance with all applicable laws and regulations.

The following **Chemical Application Restrictions** matrix must be followed. This matrix is based on the U.S. Fish and Wildlife Service's "Derivation of No Application Periods." A copy of the document is included in **Appendix A**. The agrochemical list should be reviewed annually for the effectiveness of the applied chemical, changes in regulations regarding specific pesticides, and changes in the management and use of the pesticides must be followed. The experimental use of pesticides and herbicides is prohibited. All agrochemicals must be applied in strict accordance to label instructions and restrictions.

Additionally, USSC will provide the District a quarterly report of agrochemicals in use on the sugar cane production parcels.

2.6.1.1 CHEMICAL APPLICATION RESTRICTIONS

The following are lists of chemicals provided by USSC that are used for sugar cane cultivation and vegetable farming. The following agrochemicals have the potential to be used subject to the restrictions noted below. *Chemicals not specifically listed below may be evaluated on a case by case basis and added to the appropriate category below. For chemicals with no analytical test method and identified as a potential environmental risk, the chemical manufacturer will be contacted to obtain the chemical standard. The District will then contract a Florida based laboratory to develop an analytical test method for the chemicals.

SUGAR CANE

A. May be used at any time but only according to label restrictions:

1,2-propylene glycol	Polyacrylamide	Xylene
2,4-Dichlorophenoxyacetic Acid (*Unison*)	Hydroxy carboxylic acid and/or Polyacrylic acid (*Quest*)	Water and nonionic emulsifiers (*Foambuster*)
Ethylbenzene	Polyalkyleneoxide (*Kinetic*)	Plant nutrients (*Tracite*)
Glyphosate (*Roundup, Touchdown*)	Nonionic Colloidal water (*Strike Zone*)	Naphthalene
Magnesium Sulfate (*Dyna*)	Quartz	
Paraffin based mineral oil and/or XXX (*Crop Oil*)	Sodium salt (*Asulam*)	
Petroleum solvent	Urea (*Urea*)	
Phosphatidycholine (*LI700*)	Surfactant	

B. Must be discontinued at least 3 months prior to flooding:

2-Butoxyethanol (*Dynamic*)	Methanol (*Asulox*)	Mepiquat (*Reign*)
Azoxystrobin (*Azoxystrobin*)	Mesotrione (*Callisto*)	

C. Must be discontinued at least 6 months prior to flooding:

Ethoprop (*Mocap*)	Pyraclostrobin (*Headline*)	Pyrimethanil (*Vision*)
Halosulfuron-methyl (*Sempra, Yukon*)	Phorate (*Thimet*)	Propylene Glycol and/or Carbofuran (*Furadan*)
Propylene Glycol and/or Chlorothalonil (*Quadris*)	Pendimethalin	Diphacinone (*Ramikk Brown*)

D. Must be discontinued at least 1 year prior to flooding:

Atrazine (*Atrazine*)	Ethylene dichloride (*Prowl*)	Esfenvalerate (*Asana*)
Clomazone (*Command*)	Metconazole (*Caramba*)	

E. Must be discontinued at least 2 years prior to flooding:

Ametryn (*Evik*)	Trifloxysulfuron-sodium (*Envoke*)	Cyproconazole (*Cyproconazole*)
Fluquinconazole (*Jockey*)		

F. Not allowed:
USSC does not apply any chemicals to the sugar cane that are not allowed.

****VEGETABLES – Beans, Watermelon, and Sweet Corn**

A. May be used at any time but only according to label restrictions:

Azadirachtin (*Aza-Direct & Azatin XL*)	Glyphosate (*Roundup, Durango, Touchdown, and Glyphomax*)	Bacillus subtillus strain QST 713 (*Serenade ASO, Serenade Max, Sonata, and Rhapsody*)
Bacillus thuringiensis subspecies (*Agree WG, Biobit HP, Crymax, Deliver, DiPel DF, Javelin WG, Lepinox, and Xentari DF*)	Sulfur (*Kumulus DF, Micro Sulf, Micronized Gold, Microthiol Disperss, Sulfur 90W, Thiolux Jet, and Wettable Sulfur*)	Beauveria bassiana (*BotaniGard 22WP*)
Carfentrazone (*Aim*)	Neem Oil (*Trilogy*)	
EPTC (*Eptam*)	Hydrogen dioxide (*Oxidate*)	
Pelargonic Acid (*Scythe*)	Potassium phosphite (*Fosphite, Prophyt, and Topaz*)	

B. Must be discontinued at least 3 months prior to flooding:

Buprofezin (*Courier 40SC*)	Spinosad (*Entrust and SpinTor 2SC*)
Dimethoate (*Dimethoate 4EC*)	Trifloxystrobin (*Flint 50WP*)
Oxydemeton-methyl (*MSR Spray Concentrate*)	Azoxystrobin (*Amistar 80DF, Heritage, and Quadris*)
Pyrethrin (*Pyrellin EC*)	S-Methoprene (*Extinguish*)
Pyriproxyfen (*Esteem Ant Bait and Knack IGR*)	

C. Must be discontinued at least 6 months prior to flooding:

Bentazon (*Basagran*)	Dicofol (*Kelthane 50WSP*)	Methyl parathion (Penncap-M)
Carbaryl (*Sevin 80S*)	Ethoprop (*Mocap 15G*)	Permethrin (*Ambush 25W and Pounce 25W*)
Cyfluthrin (*Baythroid 2*)	Halosulfuron-methyl (*Sandea*)	Phorate (*Thimet 20G*)
Cyhalothrin (*Proaxis Insecticide*)	Imidacloprid (*Admire 2F*)	Pendimethalin (*Prowl*)
Diazinon (*Diazinon 4E*)	Methomyl (*Lannate LV and Lannate SP*)	Chlorothalonil (*Applause 720, Bravo, Choloronil 720, Echo, Equus, and Ridomil Gold Bravo*)
Pyraclostrobin (*Cabrio 20EG*)		

D. Must be discontinued at least 1 year prior to flooding:

Dichloropropene (*Telone II*)	Esfenvalerate (*Asana XL*)	S-Metolachlor (*Dual Magnum*)
Endosulfan (*Endosulfan 3EC*)	Myclobutanil (*Nova 40W*)	

E. Must be discontinued at least 2 years prior to flooding:

Bifenthrin (*Capture 2EC*)	Mefenoxam (*Ridomil Gold 4EC, Ridomil Gold SL, and Ultra Flourish*)	Boscalid (*Pristine 38WG*)
Cyromazine (*Trigard*)	Methoxyfenozide (*Intrepid 2F*)	

F. Not allowed:

Paraquat (*Gramoxone Inteon*)

G. Period of discontinuation will be based on the rates of application and copper concentrations in the cultivated fields:

Copper Hydroxide (*Champ*)

H. Restricted Pending Further Evaluation (District is currently evaluating the long term affects of the chemical application):

Thiophanate-methyl (*Topsin M WSB and Thiophanate-methyl*)	Fludioxonil (*Maxim 4FS*)

* Any pesticide, regardless of the above categories, that is shown to be present in the soil, at or above the site specific cleanup target levels, may require additional restrictions, including reductions in use or the complete elimination of its use. These situations will be evaluated on a case-by-case basis.

2.6.2 Copper Compounds

Copper is an essential element required for the successful and economical growing of sugar cane. It is typically applied to the soil surface as a granular additive to fertilizer. The Phase II ESA identified 48, 40-acre grids, or 1,920 acres with elevated copper levels in the cultivated fields above the Service provisional Snail Kite threshold level of 85 mg/kg. Based on the Phase II findings on elevated copper concentrations, no additional copper should be applied on the 1,920 acres. In the event that copper is not bio-available, as verified by additional soil testing, USSC will work with the District to develop a copper nutrient application that will benefit the production of sugar cane and limit the residual copper levels in the soils as much as practical. **Table 1** displays the field identification numbers for copper concentrations above 85 mg/kg.

URS reviewed the current rates of application and amounts of copper based nutrients applied on the USSC property. Utilizing this information, a mass balance equation was developed in order to determine if additional acreage would be impacted by copper based on the current application activities. URS determined that copper could potentially increase in the soils, per application, at a rate of 2.08 mg/kg per acre. Based on this application rate, and the fact that the property is leased through 2016, four, 40-acre

grids have the potential to accumulate copper above the Service's interim value for copper of 85 mg/kg during the lease agreement.

During this interim use period, soil samples should be collected for previous sampled areas within the cultivated fields to confirm that residual copper concentrations are not accumulating in the soil. In the event that elevated copper concentrations are detected, then the tenant must implement measures to prevent further increases. A subsequent determination of a 20 percent or greater increase, based on the methodology in **Section 3.0**, below, will constitute a breach of the tenant's lease.

If the sampling conducted in the subsequent year again indicates elevated copper above the 85 mg/kg the District and USSC will work together to develop a copper application that will limit the residual copper levels in the soils as much as practical.

2.6.3 Pesticide and Herbicide Management

Florida pesticide law requires certified applicators to keep records of all restricted use pesticides (RUP). The federal worker protection standard (WPS) requires employers to inform employees of all pesticides applied.

- Pesticide record keeping
- Read and understand label
- Pesticide storage

Implementation requirements include:

- Site verification will include discussion with operation managers to understand the agricultural operation pesticide management approach. In addition, example records should be available and reviewed to reinforce the implementation tools used to assist with pesticide management decisions.
- Required records must be made available upon request to FDACS, USDA authorized representatives, and licensed health care professionals.
- Proper pesticide storage is important for (a) personnel safety and (b) as a preventative spill measure. Visual observations will ensure the following procedures are in place:
  - Storage structures should keep pesticides secure (locked) and isolated from the surrounding environment.
  - Pesticides need to be stored in their original containers.
  - Pesticides should not be stored near burning material, hot work (welding, grinding), or in shop area.
  - No smoking is allowed in pesticide storage areas.
  - Store personal protective equipment where it is easily accessible in the event of an emergency, but not in the pesticide storage area.
  - Maintain a current written inventory and the Material Safety Data Sheets (MSDS) for the chemicals used in the operation. Do not store this information in the pesticide storage room

itself.

- Large chemical quantities should not be stored for long periods of time. Adopt the "first in – first out" principle, using the oldest products first to ensure that the product shelf life does not expire.
- Containers need to be arranged so that labels are clearly visible; make sure labels are legible; refasten loose labels.
- Dry bags should be raised on plastic pallets to ensure that they do not get wet. Do not store liquid material above dry materials.
- Flammable pesticides should be stored separately from non-flammable pesticides.
- Segregated herbicides, insecticides, and fungicides to prevent cross-contamination and minimize potential for misapplication.
- Shelving should be made of plastic or reinforced metal. Metal shelving painted (unless stainless steel) to avoid corrosion. No wood shelving because it may absorb spilled pesticide materials.

2.6.4 Pesticide and Herbicide Application Optimization

Management of the types and amounts of pesticides applied in or on the soil or on plant foliage is important so the exact problem identified is being addressed and minimize the impacts to surface and ground water. Even pesticides designed for rapid breakdown in the environment can persist for years if present in high concentrations. Worst-case results can be contamination of drinking water; fish kills and other impacts to nontarget organisms; and administrative fines and legal remedies. The most obvious method to reduce the risk from pesticides is to use them only when necessary.

- Integrated pest management
- Application timing
- Customized applications
- Maintain soil pH in optimum range
- Pesticide selection

Implementation requirements include:

- Integrated Pest Management (IPM) is a philosophy of management pests that aims to reduce farm expenses, conserve energy, and protect the environment. IPM is a broad, interdisciplinary approach using a variety of methods to systematically control pests which adversely affect people and agriculture. Basic steps include:

  1) Identify key pests/vegetation and beneficial organisms and the factors affecting their populations.
  2) Select preventative cultural practices to minimize pests/vegetation and enhance biological controls (e.g. soil prep, crop rotation, resistant varieties, modified irrigation dates, cover

crops, augmenting beneficials, etc.).

3) Use trained 'scouts' to monitor pest/vegetation populations to determine if or when an emergency control tactic might be needed.

4) Predict economic losses and risks so that the cost of various treatments can be compared to the potential losses to be incurred.

5) Decide the best course and carry out the corrective actions.

6) Continue to monitor pest/vegetation populations to evaluate results of the decision and the effectiveness of correction actions. Use this information when making similar decisions in the future.

USSC currently has an IPM program in place and the policy has been implemented.

- Always follow pesticide/herbicide label instructions. However, pesticide and herbicide recommendations can change frequently. Registrations may be canceled or added at any time. Recommended rates or products that were valid at the start of the growing season may change. For pesticides/herbicides that are not generally used on the property, check with the local Extension agent for the most recent recommendations, or access the computer based Florida Agriculture Information Retrieval System (FAIRS).
- Base pesticide/herbicide selection on characteristics such as soil, geology, depth to water table, proximity to surface water, topography and climate, so that the potential for pollution of surface water and ground water is minimized.
- Consider the effect of a pesticide/herbicide application on any beneficial organism that may be present.

Federal and State Chemical Hazard Information contacts and telephone numbers are given in **Appendix C**.

2.6.5 Pesticide and Herbicide Handling and Placement

Routine maintenance, good repair, and calibration of pesticide application equipment will minimize the unintended over (or under) application of chemicals. Correct measurement will keep the operation in compliance with the label, reduce risks to applicators, operation staff, and the environment, and may save money. Locate mixing and loading operations well away from groundwater wells and surface water ditches, laterals and canals where runoff may carry inadvertently transport spilled chemicals. Proper cleaning and disposal of "empty" pesticide containers is just as important as proper application of the chemicals. Listed below are the various required pesticide handling and placement BMPs.

- Reduce spray drift
- Equipment calibration & maintenance
- Pesticide spill management
- Pesticide application equipment wash water
- Prevent backflow to water sources

- Mixing and loading activity locations
- Pesticide container management
- Excess pesticide mixture
- Excess formulation (raw product)

Implementation requirements include:

- Site verification will include discussion with operation managers to understand the agricultural operation pesticide handling and placement approach. In addition, site inspections will be made to observe the following items:

Permanent Locations

- A permanently located mixing and loading facility should be designed to provide a place where high-potential spill activities can be performed over an impermeable surface (such as sealed concrete) for easy cleaning and permits the recovery of spilled materials.
- USSC currently does not have a permanent mixing and loading facility. Should USSC elect to construct a permanent mixing and loading facility, the facility must be in compliance with IFAS standards.
- The mix/load facility should be located close to the chemical storage building.
- Permanent areas should have a roof with a substantial overhang on all sides to protect against windblown rainfall.

Temporary Locations

- Pesticide loading activities should be conducted at random locations in the field lessens the chance of buildup of spilled material at any one place. This will reduce the chance of adversely affecting the natural organisms which biologically degrade pesticides.

Nurse Tanks

- Use of clean water only in nurse tanks transported to the field to fill the sprayer is encouraged. Never introduce pesticides into a nurse tank.
- Inject pesticides into the transfer line or add them to the spray rig during filling.
- Pesticides may be introduced by conventional pouring, or pumped by a closed system, depending on label requirements and container type.
- Always use a check valve to prevent backflow of pesticides into the clean mix water.

Container Disposal

- No bags, boxes, and Group I pesticide containers may be burned on-site.
- Keep the rinsed containers in a clean area, out of the weather, or in large plastic bags for disposal or recycling to protect the containers from collecting rainwater.

URS has reviewed the USSC portable mix-load operations and the system is in compliance with IFAS.

2.7 COPPER

Copper has several necessary and beneficial uses within an active agricultural operation including use as fungicides and soil nutrients, and as a canal and ditch aquatic vegetation management tool. Recently, the topic of residual levels of copper in soils of tracts which are intended for conversion to water reservoir areas has had renewed discussion. The District has reported that some analyses and data extrapolations suggest that elevated copper levels have the potential to move through the aquatic food chain and bio-accumulate in the tissue of apple snails. The apple snail is the primary diet of the Snail Kite. It has been reported to the District that it is theorized that elevated copper levels can potentially result in underweight Snail Kite chicks. Since the Snail Kite is listed as an Endangered Species, and the potential for this bird to forage in the future reservoirs, the minimization of the risk for elevated copper levels is desired by the District. Extreme diligence is needed to minimize the amount of copper applied.

Implementation requirements include:

- Site verification will include discussion with operation managers to understand the agricultural operation copper application (if any) optimization approach.
- Records should be available and reviewed to reinforce the implementation tools used to assist with copper management decisions. Records should identify:
  - Locations (e.g. cultivated field, ditch and canal) where copper was applied
  - Time of application
  - Application mixture/application rate applied

2.8 PETROLEUM AND HAZARDOUS WASTE MANAGEMENT

2.8.1 Gasoline and Diesel Fuel Storage and Containment

The first line of management is to minimize the possibility of inadvertent petroleum product discharge and the need for clean-up and disposal. Stationary fuel storage tanks should be in compliance with FDEP storage tank regulations (Chapter 62-761, FAC for underground storage tanks (USTs) and Chapter 62-762, FAC for aboveground storage tanks (ASTs)). In the event of a discharge or spill, emergency response and chemical hazard information and telephone numbers are given in **Appendix C**.

Implementation requirements include:

- Site verification will include discussion with operation managers to understand the agricultural operation petroleum storage and containment management approach. In addition site inspections will be made to observe the following items:

Site Equipment

  - Placement of permanent fuel pumps on concrete or asphalt surfaces away from groundwater wells and surface water ditches, laterals and canals where runoff may carry inadvertently transport spilled product.
  - ASTs with volumes of 550 gallons or larger must be registered and located within secondary

containment systems unless of double-wall construction.

- Visual inspections should be conducted on a least a monthly basis of the storage tanks and hoses to ensure the system is free from leakage from tank seams, connections, and fittings.

Fuel delivery

- Require delivery driver to report to facility manager upon arrival prior to loading or unloading.
- Agricultural operation employee should verify available tank capacity prior to product transfer.
- Agricultural operation employee should remain onsite during delivery to monitor product transfer.
- Clean-up equipment and/or materials should be located nearby if needed for immediate spill containment and clean up (boom, granular absorbent, etc.).

2.8.2 Equipment Cleaning and Maintenance

(Does not include pesticide application equipment) The same level of preventive measures should be taken to minimize adverse sediment/water quality impacts from the cleaning of equipment as with fertilizer and agrochemical handling and application. Other than preventative maintenance and emergency repair of machinery and equipment conducted on site, maintenance should be conducted in a centralized area a safe distance from the closest well-head or surface water ditch, lateral, and canal. It is recommended that equipment maintenance be limited to minor or emergency repairs. Activities such as engine or mechanical repair, which generate a waste or waste by-product, are not recommended to be conducted in the fields but at designated maintenance areas.

Implementation requirements include:

- Site verification will include discussion with operation managers to understand the agricultural operation hazardous waste management approach. In addition, site inspections will be made to observe the following items:

General Equipment Maintenance

- Where possible, it is recommended to use compressed air to remove clippings and dust from machinery. This is less harmful to the equipment's hydraulic seals, eliminates wash water, and produces dry material that is easy to handle.
- For regular field equipment wash down (other than pesticide application equipment, and not with degreaser or solvents), allow wash water to flow to a grassed retention area, swale, or sod fields as irrigation water. Do not allow wash water to flow directly to surface water ditch, lateral, or canal.
- Minimize the use of detergents and use only biodegradable, non-phosphate type. The amount of water used to clean equipment can be minimized by using spray nozzles that generate high pressure streams and low volumes.

- If equipment is to be intensively washed, conduct over a concrete or asphalt pad that allows the water to be collected. Wash water can contain soaps, fertilizer residues, solids, and lubricating oil residues. Collected wash water can be handled through a recycling system, treatment system, off-site disposal at an industrial wastewater treatment facility, or use the wash water for field irrigation.

Solvents and Degreasers

- It is the intention that all major repairs and maintenance activities that would potentially require the use of solvents and degreasers be conducted on-site at designated maintenance areas. In the event that such activities occur on-site, the operator will follow the guidelines below:
  - Whenever practical, replace solvent baths with recirculating aqueous washing units.
  - Soap and water or other aqueous cleaners are often as effective as solvent-based cleaners.
  - Store solvents and degreasers in lockable metal cabinets in an area away from ignition sources (e.g. welding areas, grinders) and provide adequate ventilation.
  - Always wear the appropriate protective personal equipment, especially eye protection, when working with or handling solvents.
  - Solvent wash basins that drain into recovery drums can be provided by private firms contracted to pick-up and recycle or properly dispose of the drum content.
  - Never mix used oil and other liquid material with the used solvents.
- Records must be maintained of pick-up and quantities disposed.

Paint

- The use of power sprayers for painting equipment on-site requires the appropriate precautions to be taken not to impact soil or groundwater. The painting of equipment with solvent based paint by power sprayers is prohibited and must be conducted off-site.
- Touch-up and manual painting may be conducted on a limited basis.
- Care should be taken not to spill material onto soil or into surface water bodies.

Used Oil, Coolant, and Lead-Acid Batteries

- Collect used oil and oil filters in separate marked containers and recycle.
- Oil filters should be drained and taken to the same place as the used oil, or to a hazardous waste collection site.
- Coolant/Antifreeze must be recycled or disposed as a hazardous waste. Do not mix used oil with used coolant or sludge from solvents.
- Lead-acid storage batteries are classified as hazardous wastes unless they are recycled. Store batteries on an impervious surface and preferably under cover until delivery to an authorized recycling facility.

All used oil, coolant, and lead-acid batteries are stored in containers in accordance with FDEP rules until being transported offsite for disposal by a licensed contractor.

3.0 SAMPLING AND COMPLIANCE PLAN (SUGARCANE AREAS)

3.1 VERIFICATION SAMPLING

Cultivated area sampling will be conducted by the District on an annual basis. Soil samples shall be collected from the cultivated area at randomly selected locations based on the grid pattern and numbering system used in the Phase I/II ESA. The BMP annual sampling event will randomly select a number of those grids sampled during the Phase I/II ESA. Based on the Phase I/II ESA findings and review of the chemicals list provided by USSC, the sampling activities by the District will involve grids, which are identified by USSC as being fallow. The grids generally comprise 40-acres fields. Within each field, at equally spaced locations, eight (8) close-composite discrete samples from the top 6-inches of the soil will be collected and combined into a single composite sample. The composite samples will then be analyzed for a number of parameters of concern.

The number of grids to be sampled are determined according to the *a priori* statistical procedure recommended by the United States Environmental Protection Agency (EPA, 1989, Section 6). This procedure is based on commonly used, well-established statistical hypothesis testing processes, in which, collected data during each year is compared to the baseline dataset in order to detect the presence of any statistically significant difference (EPA, 2000). For determination of the sample size, EPA (1989) suggests a null hypothesis that is equivalent to the condition, under which the baseline and subsequent datasets display statistically significant differences. Conversely, the alternative hypothesis corresponds to a condition, under which the baseline and subsequent datasets are devoid of any statistically significant difference. Each year, upon collection of one round of post-baseline samples, the compiled baseline and subsequent datasets are statistically compared to assess whether further investigations are warranted. The components of the proposed statistical process are described in the following sections.

3.1.1 Determining Number of Baseline Grids

EPA (1989, Section 6.3.2) provides a quantifiable measure for determining an adequate sample size. The sample size is driven by three factors: (a) the chosen decision errors, (b) the variability of the potential contaminants of concern, and (c) the desired resolution, *i.e.*, the difference between the baseline and subsequent datasets that needs to be detected at the chosen confidence. The resulting equation is

$$n = \frac{(z_{1-\alpha} + z_{1-\beta})^2 s^2}{\Delta^2}$$

where,

n = number of grids to be sampled each year

α = the false positive rate, Type I error, or the significance (tolerable error for missing an actual difference between the baseline and subsequent datasets)

$1-\alpha$ = the confidence (probability of correctly identifying a significant change)

β = the false negative rate, or Type II error (tolerable error for incorrectly declaring a difference between the baseline and subsequent datasets)

$1-\beta$ = the test power (probability of correctly identifying the absence of no difference)

$z_{1-\alpha}$, $z_{1-\beta}$= the confidence and power normal deviates

s^2 = standard deviation of parameter of concern

Δ = The minimum difference between the mean concentrations of the baseline and subsequent datasets to be detected at the chosen confidence

Samples collected at the selected grids within the purchase area during the Phase I/II ESA conducted on the USSC property by PSI in August and September 2008 shall be used as the baseline for comparison to future sampling results. Among parameters of concern, arsenic, copper and selenium have been analyzed extensively during Phase I/II ESA. The reported concentrations of these analytes based on composite samples from 40-acre sugarcane fields are used in order to compute their corresponding mean and standard deviation, as listed in **Table 2**. This table also displays the number of samples based on the chosen decision errors. In these calculations, the desired minimum difference is set as 20% of the computed mean concentrations. Among the parameters of concern, currently available baseline copper data indicate the highest sample size, which is selected to ensure the conservative nature of the proposed BMP annual sampling plan. This results in 109 grids to be randomly selected for baseline and sampling purposes as part of the BMP efforts, as highlighted in **Table 2**.

3.1.2 Baseline/Subsequent Datasets Statistical Comparisons

Annual BMP sampling will be conducted, at field locations with the same GPS coordinates measured during the initial sampling and at a time mutually agreed upon by the parties so as to minimize damage to field crops, to ensure consistency with the original Phase I/II ESA results. Upon completion of each annual BMP sampling round, the analytic results of parameters of concern will be compared to those compiled in the baseline and previous BMP datasets. For this purpose, a series of comprehensive statistical two-sample tests will be conducted. Pursuant to DON (2002), as listed on **Table 3**, two difference hypotheses will be assessed, including:

(a) Area-wide differences between the baseline and subsequent datasets: This hypothesis corresponds to a condition, under which the baseline concentrations are consistently different from the subsequent concentrations. Consequently, the statistical tests will be conducted through comparison of mean (parametric) and median (non-parametric) concentrations.

(b) Localized differences between the baseline and subsequent datasets: This hypothesis corresponds to a condition, under which only the elevated baseline and subsequent

concentrations are different. Consequently, the statistical tests will be conducted through comparison of higher concentrations or exceedance ratios in each dataset.

The procedural aspects for the selection and implementation of the cited tests in **Table 3** are described in details in DON (2002, Chapter 4). Appropriate statistical comparisons, including parametric t-tests, non-parametric Wilcoxon Rank Sum test, and non-parametric Slippage tests, will be conducted annually. Depending on the statistical characteristics of the subsequent datasets, additional test may be performed. In the case of detection of a statistically significant increase at 5% significance, when the increase in mean or median concentrations is greater than 20%, among subsequent measured concentrations with respect to the baseline concentrations, additional investigations and actions, as set forth below, will be pursued.

The specific objectives of additional investigations are: (a) to determine whether the detected increase in post-baseline concentrations are real, and not numeric artifacts caused by the variability of individual samples results, and (b) if real, to determine whether the detected increases in post-baseline concentrations are due to practices by the tenant. For this purpose, additional investigations will be initiated, including a review of laboratory QA/QC results and information provided by the tenant concerning its chemical use practices during the period of interest. If increase in mean concentrations is attributed to few outlier samples among post-baseline data, locations associated with these outliers will be re-sampled to ensure the validity of the original results. The cost of additional investigations shall be the responsibility of the party requesting it.

If the District determines that a detected increase in mean or median concentrations in excess of 20% is a numeric artifact caused by the variability of individual samples, or attributed to historic conditions, no further action with regards to the tenant's lease will be pursued. On the other hand, if the increase in mean or median concentrations in excess of 20% is deemed to have been caused by other factors, the District will notify the tenant in writing of its determination and its basis, and the tenant will be requested to implement those measures, if any, that the tenant considers appropriate to prevent further increases in concentrations, including but not limited to additional sampling or best management practices.

If a statistically significant increase in concentrations is detected during a subsequent consecutive year and determined by the District to not be a numeric artifact or caused by variability of individual samples, the tenant shall work cooperatively with the District to develop a more comprehensive BMP plan to reduce or eliminate further increases. The new BMP plan shall be approved by the District, implemented by the tenant, and incorporated into the lease and, in the case of a subtenant, its sublease. In the event a subsequent consecutive sampling event results in a third, consecutive statistically significant increase, the District, in consultation with the tenant, shall review the tenant's standard farming practices, which review should include an assessment of the practices in terms of potential risk to future aquatic ecosystems or

human health. If it is determined that the increase in concentrations may cause significant risk to future ecosystems that may be constructed in the area or human health to workers or occupants, the tenant will implement changes to its standard practices prescribed by the District, after joint consultation with the tenant, to reduce the potential for such risk. Failure to implement this review within the prescribed schedule will be considered a default of the tenant's lease.

3.1.3 Summary of BMP Sample Plan

Table 4 lists BMP sample plan inside and outside of sugarcane cultivation areas, as well as the current list of parameters of concern. Given the fact that for a number of parameters of concern, there are currently no baseline dataset available, the sample size computations will be repeated after the first round of BMP periodic sampling, which may result in applicable modifications of this BMP plan to address elevated parameters of concern covering parts or the entire extent of the investigated areas. Future changes in subsequent rounds of BMP may include further division of the investigated areas into more homogenous subareas for the purposes of sampling and statistical comparisons. Such changes may require additional sampling to accommodate the delineated subareas. Furthermore, in the event that obvious and excessive impacts are visibly detected during periodic site visits conducted by the District, a more comprehensive site-specific sampling plan that would depend on the magnitude of the impact should be developed under the direction of the District and applicable regulatory agencies. A list of potential parameters to be analyzed for is given below.

- EPA Method 8141 (organophosphorus pesticides)
- EPA Method 8151 (chlorinated herbicides)
- EPA Method 6010/7471 (copper)
- FL-PRO Method (total residual petroleum hydrocarbons)
- EPA Method 8100 (polynuclear aromatic hydrocarbons)
- EPA Method 8020 (volatile organic hydrocarbons)
- Metconazole and pyraclostrobin

TABLES

TABLE 1
U.S. SUGAR CORPORATION
SUGAR CANE COPPER CONCENTRATIONS ABOVE 85 mg/kg - FIELD IDENTIFICATION
Job No. 38617-027

Tract Number	Map	Block/Field #	Agricultural Product	Acres
SC-100-161	5	2319P	Sugar Cane	40
SC-100-162	5	2322EF	Sugar Cane	40
SC-100-042	8	3429DH	Sugar Cane	40
SC-100-044	10	3433AE	Sugar Cane	40
SC-100-060	15	3425MN	Sugar Cane	40
SC-100-079	15	3531D	Sugar Cane	40
SC-100-080	17	4504OP	Sugar Cane	40
	17	4515CD	Sugar Cane	40
	17	4515JN	Sugar Cane	40
	17	4515O	Sugar Cane	40
	17	4516GH	Sugar Cane	40
	17	4516IM	Sugar Cane	40
	17	4516KO	Sugar Cane	40
	17	4517KL	Sugar Cane	40
SC-100-140	17	4518CD	Sugar Cane	40
	17	4518KL	Sugar Cane	40
	19	4519CG	Sugar Cane	40
	19	4519DH	Sugar Cane	40
	19	4519LP	Sugar Cane	40
	19	4530AE	Sugar Cane	40
	19	4530BF	Sugar Cane	40
	19	4530CG	Sugar Cane	40
	19	4530DH	Sugar Cane	40
	19	4530IM	Sugar Cane	40
	19	4530JN	Sugar Cane	40
	19	4530KO	Sugar Cane	40
SC-100-084	19	4528KL	Sugar Cane	40
	19	4532OP	Sugar Cane	40
SC-100-095	21	4619JN	Sugar Cane	40
	21	4619KO	Sugar Cane	40
	21	4619LP	Sugar Cane	40
	21	4621BF	Sugar Cane	40
	21	4621IM	Sugar Cane	40
SC-100-096	21	4525CG	Sugar Cane	40
	21	4525DH	Sugar Cane	40
	21	4629IM	Sugar Cane	40
	21	4629JN	Sugar Cane	40
	21	4629KO	Sugar Cane	40
	21	4629LP	Sugar Cane	40
	21	4630DH	Sugar Cane	40
	21	4631CG	Sugar Cane	40
	21	4631DH	Sugar Cane	40
	21	4631KO	Sugar Cane	40
	21	4631LP	Sugar Cane	40
	21	4632AE	Sugar Cane	40
	21	4632BF	Sugar Cane	40
	21	4632CG	Sugar Cane	40
	21	4632DH	Sugar Cane	40

Tract Number	Map	Block/Field #	Agricultural Product	Acres
SC-100-099	21	4628AE	Sugar Cane	40
	21	4628IM	Sugar Cane	40
	21	4628KO	Sugar Cane	40
	21	4628LP	Sugar Cane	40
	21	4633AE	Sugar Cane	40
	21	4633CG	Sugar Cane	40
	21	4633DH	Sugar Cane	40
	21	4633IM	Sugar Cane	40
	21	4633JN	Sugar Cane	40
	21	4633KO	Sugar Cane	40
	21	4633LP	Sugar Cane	40
	22	4634BF	Sugar Cane	40
	22	4634IM	Sugar Cane	40
	22	4634JN	Sugar Cane	40
SC -100-097	22	4622IJ	Sugar Cane	40
SC-100-002	23	5525CD	Sugar Cane	40
	23	5525KL	Sugar Cane	40
	23	5526AB	Sugar Cane	40
	23	5526EF	Sugar Cane	40
	23	5535IJ	Sugar Cane	40
	27	3734CG	Sugar Cane	40
SC-100-114	27	3734CG	Sugar Cane	40
SC -100-115	27	3736AE	Sugar Cane	40
	27	3736BF	Sugar Cane	40
	27	3736DH	Sugar Cane	40
	27	3736KO	Sugar Cane	40
	27	3736LP	Sugar Cane	40
	27	4702CG	Sugar Cane	40
	27	4712DH	Sugar Cane	40
SC-100-138	27	3836GH	Sugar Cane	40
	27	3836KL	Sugar Cane	40
SC-100-113	28	3819EF	Sugar Cane	40
SC -100-118	30	2819KL	Sugar Cane	40
	30	2819OP	Sugar Cane	40
	30	2820AF	Sugar Cane	40
	30	2820IJ	Sugar Cane	40
	30	2820KL	Sugar Cane	40
	30	2820MN	Sugar Cane	40
	30	2820OP	Sugar Cane	40
SC-100-131	32	1830IM	Sugar Cane	40
	32	1830JN	Sugar Cane	40
	32	2702D	Sugar Cane	40
SC-100-132	33	1712KL	Sugar Cane	40
	33	1712MN	Sugar Cane	40
	33	1712OP	Sugar Cane	40
	33	1713AE	Sugar Cane	40
	33	1713BF	Sugar Cane	40
	33	1713CG	Sugar Cane	40
	33	1816MN	Sugar Cane	40
SC-100-134	36	2836KO	Sugar Cane	40
	36	2931AE	Sugar Cane	40
	36	2931IM	Sugar Cane	40
	36	2931JN	Sugar Cane	40
	36	3801CG	Sugar Cane	40
	36	3906AE	Sugar Cane	40
	36	3906BF	Sugar Cane	40

Table 2. Statistical Determination of the Number of Baseline Grids

Decision Parameters	Selected Value	Normal Variate	
Significance = alpha	5%	$z_{1\text{-alpha}}$ =	1.64
Power = 1 - beta	80%	$z_{1\text{-beta}}$ =	0.84
Delta as % of Baseline Mean	20%		

Chemical-Specific Parameters	Arsenic (mg/kg)	Copper (mg/kg)	Selenium (mg/kg)	Atrazine (ug/kg)
Desired Resolution	1.17	12.4	0.37	9.10
Baseline Mean*	5.87	62.0	1.86	45.49
Baseline Standard Deviation*	3.44	51.9	1.33	37.99
n (Number of Samples)	**54**	**109**	**80**	**108**

*Computed based on Phase 2 Sugarcane 40-acre Composite (SC) Data

** 4 outlier results are excluded.

Table 3. Statistical Comparative Tests

Difference Hypothesis	Test	Comparison	Type
Area-wide Difference	Wilcoxon Rank Sum (WRS)	Median	Non-parametric
	Gehan	Median	Non-parametric
	Student's two-sample t-test	Mean	Parametric
	Satterthwaite t-test	Mean	Parametric
Localized Difference	Slippage	High concentrations	Non-parametric
	Quantile	High concentrations	Non-parametric
	Two-sample test of proportions	Percent of measurements above a given cutoff	Non-parmetric

Table 4. Summary of Sample Plan

Areas	Number of Samples		Parameters*
Sugar Cane Cultivation Area	109 composite samples	Annually (40-acre eight point composite soil sample using close composite methodology– top 6'')	Arsenic, Copper, Selenium Clomazone Pendimethalin Analytical test method will be developed for fungicides Caramba and Headline by Florida based laboratory.
Pump Stations	No Sample	If no staining / stressed or disturbed vegetation.	
	0 sample 1 each site	If impacts observed (five point composite soil sample – top 6'')	EPA Method 602 EPA Method 610 FL-PRO
Chemical and Equipment Storage Areas	No Sample	If no staining / stressed or disturbed vegetation	
	1 each site	If impacts observed (five point composite soil sample – top 6'')	EPA Method 602 EPA Method 610 FL-PRO Arsenic, Copper, Selenium Clomazone Pendimethalin 8151 Analytical test method will be developed for fungicides Caramba and Headline by Florida based laboratory.

**Parameter Descriptions*

EPA Method 602 (purgeable aromatics)
EPA Method 610 (polynuclear aromatic hydrocarbons)
FL-PRO (total residual petroleum hydrocarbons)
Total Arsenic
Copper by EPA Method 6010/7471
Selenium
Clomazone by EPA Method 8141
Pendimethalin by EPA Method 8081
EPA Method 8151 (chlorinated herbicides)

3.1.4 References

Department of the Navy (DON). "Guidance for Environmental Background Analysis. Volume I: Soil." NFESC. User's Guide. UG-2049-ENV. April 2002.

U.S. Environmental Protection Agency (EPA). "Methods for Evaluating the Attainment of Cleanup Standards. Vol. 1: Soils and Solid Media." Office of Policy, Planning, and Evaluation. Washington, D. C. EPA 230/02-89-042. 1989

United States Environmental Protection Agency (EPA). "Data Quality Objectives Process for Hazardous Waste Site Investigations. EPA QA/G-4HW Final." EPA/600/R-00/007. January 2000

4.0 STANDARDIZED FORM: BMP SITE VERIFICATION FINDINGS SUMMARY

Future BMP site verification visits will be conducted at the request of the District. BMP implementation will be reviewed per the guidelines and 'Implementation Requirements' described for each BMP earlier in this document as well as taking site specific issues and time of year into account. The site verification findings, including a written review of observations, site photographs taken, and a summary of records reviewed, are expected to be provided by the field reviewer in a detailed report. The field verified implementation status of each BMP will be classified in one of three categories:

- Implementation Verified
- Implementation Verified with Comment
- Additional Attention Required

The standardized form for reporting *BMP Site Verification Findings Summary* to be included in the BMP field verification report is included in **Appendix B**.

APPENDIX A

Derivation of "No Application Periods" for Interim Use Pesticides

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I. INTRODUCTION

The South Florida Water Management District (SFWMD) is actively acquiring agricultural lands in South Florida in connection with the Everglades Restoration Project. These lands are slated for various water management projects including conversion to water attenuation reservoirs, creation of stormwater treatment areas (STAs) for removal of phosphorus and other nutrients, and restoration of wetlands in areas formerly drained for agriculture. All of these projects will likely attract large numbers of birds and other wildlife. Since all of these areas were, or still are, agricultural areas, they have probably been exposed to heavy pesticide applications for decades and residues of some of those pesticides very likely still remain in the soil. Some of the pesticides used were organochlorine compounds such as toxaphene and DDT, which are now banned due to their extreme persistence in soil and their tendency to bioaccumulate in the food web. Residues of these chemicals in soils at a recent wetland restoration project in Florida (Lake Apopka) have resulted in bird die-offs following flooding of the site.

Following land acquisition for a water management project, there may be a delay of up to five years before completion of the project and actual flooding of the wetland or reservoir occurs. During this "interim use period," the former landowner is usually allowed to lease the property and continue with existing agricultural uses. Because of the risks to fish and wildlife that will be attracted to the site following flooding, questions arise as to what types of pesticides, and in what quantities, should be allowed to be applied to these lands during the interim use period. This document was developed in response to these questions.

Because the U.S. Fish and Wildlife Service (Service) must approve these interim uses of grant lands, it has sought to discover what chemicals are being used in conjunction with the uses. The Service has sought the assistance of the SFWMD in this effort; however, the Service and the SFWMD do not agree as to the necessity for, and the feasibility of, obtaining this information from the former landowner. This issue has delayed the finalization, acceptance and implementation of a mutually agreeable protocol by which the SFWMD can seek, and the Service grant, approval of the interim uses. Until the protocol can be developed, the Service cannot provide formal approval of the uses.

In order to resolve this issue, the Service has developed an alternative to requiring the SFWMD to submit chemical use information. Instead, the protocol itself will contain the following chemical use schedule, which the SFWMD will incorporate the pertinent portions into any leases, reservations, or any other methods of allowing an interim use on lands acquired with grant funds. The schedule identifies chemicals which may be used on grant lands, and the amount of time the use of each chemical must cease prior to the incorporation of the parcel into an Everglades restoration project. The time period for each chemical is based upon that chemical's $T_{1/2}$ value (half-life). Accordingly, regardless of which chemicals had been applied to a specific parcel before it was acquired by the SFWMD with grant funds, the SFWMD will be authorized only to allow the use of certain chemicals for certain amounts of time.

II. METHODS

Information on persistence and degradation, toxicity, and use of pesticides in Florida was obtained from various internet databases and published references. The publication *Summary of Agricultural Pesticide Usage in Florida: 1995 - 98* (Shahane, 1999) was reviewed to develop a list of pesticides commonly used in South Florida. Data on half-life, degradation rate, and toxicity of these substances were obtained primarily from the Hazardous Substances Data Bank (HSDB), the Environmental Fate Database (EFDB), and the Extension Toxicology Network (EXTOXNET). For many of the chemicals used in Florida, environmental fate has been researched extensively and numerous literature values for half-life and/or degradation rate were available. For some chemicals, only a few values could be located.

Degradation rates of pesticides in soil can vary tremendously depending on soil type, climate, soil pH, moisture content, depth beneath the surface, and other variables. Therefore, the $T_{1/2}$s and degradation rates reported in the literature for the same chemical may vary over a wide range, depending on the conditions in the different studies. No attempt was made to select only those studies most appropriate to conditions in Florida soils. All relevant values for a chemical, including both field and laboratory experiments, were included in the database for that chemical; however, obviously irrelevant studies (such as those using sterile soils) were not included.

Many studies presented calculated soil $T_{1/2}$ values for the chemical being studied, and these values were entered directly into the database for that chemical. Other studies did not calculate $T_{1/2}$ values, but instead presented raw degradation rates. For example, an entry might state that the chemical was 67% degraded in 10 days. For these situations, the $T_{1/2}$ was calculated using the following formula (assuming 1st order kinetics) (Casarett et al., 1996):

$$T_{1/2} = \frac{.693 * t}{2.303(2 - \log(100 - d))}$$

where t = time since application and d = percent degraded.

All $T_{1/2}$ values obtained directly from the online databases and those calculated from raw degradation data were entered into a spreadsheet (see Appendix A). Using all of these data, median and maximum $T_{1/2}$ values were determined for each chemical. In addition, some studies presented persistence times for pesticides, i.e., the length of time required for all of the chemical to be degraded. Although $T_{1/2}$ values could not be calculated from these data, the range of reported persistence was also recorded. Table 1 summarizes all half-life, persistence, and toxicological information considered for each chemical.

The "no application period" is defined as the period of time prior to conversion of the agricultural land to conservation purposes (e.g., flooding to create wetlands) during which a particular pesticide hazardous to fish and/or wildlife should *not* be applied, in order to allow adequate time for breakdown

of pesticide residues before use of the land by Service trust resources. This period of time was defined as 5 times the median half-life, representing 97 percent degradation. Based on this 5 X $T_{1/2}$ value, the pesticide was placed into one of the following no application periods: 3 months, 6 months, 1 year, or 2 years (Table 1). Due to uncertainties of the planning and scheduling process, it was decided that those rare pesticides requiring more than 2 years to break down should not be applied at all.

In those cases where $T_{1/2}$ data were scanty or differed substantially from persistence data, professional judgement was used. Preference was sometimes given to persistence data, particularly in the case of highly toxic compounds. For example, the pesticide disulfoton, which is highly toxic to fish and wildlife, was placed in a 1 year no application category based on the longer persistence of toxic metabolites compared to the parent compound. In this case, use of five times the median half-life of the parent compound would have underestimated the breakdown time to nontoxic products (Table 1).

III. RECOMMENDATIONS

A. The following pesticides are approved for application during the interim use period with **no restrictions** other than those required by the label:

2,4-D	glyphosate
Bacillus thuringiensis (Bt)	metolachlor
copper compounds	metribuzin
dicamba	norflurazon
diquat	potassium salts
diuron	sethoxydim
EPTC	sulfur
fluazifop-p-butyl	simazine

B. The following lists include some of the most commonly used pesticides in South Florida that are thought to be hazardous to fish and wildlife. These chemicals are approved for application during the interim use period with the following restriction: Use of these chemicals should be discontinued for the indicated time period prior to flooding agricultural lands for wetland restoration, creating water retention reservoirs, or any other activity likely to attract fish and wildlife to the site.

Use of the following should be **discontinued at least 3 months** prior to flooding:

acephate	malathion
alachlor	methidathion
diazinon	methyl parathion
dimethoate	oxamyl
	trichlorfon

Use of the following should be **discontinued at least 6 months** prior to flooding:

aldicarb	ethoprop
azinphos-methyl	ethyl parathion
carbaryl	permethrin
carbofuran	phorate
chlorpyrifos	terbufos

Use of the following should be **discontinued at least 1 year** prior to flooding:

atrazine	esfenvalerate
cyfluthrin	fenamiphos
disulfoton	fonofos
endosulfan	

Use of the following should be **discontinued at least 2 years** prior to flooding:

dicofol	trifluralin

C. Due to their high toxicity and/or extreme persistence in the environment, the following chemicals **should not be applied** during the interim use period to lands being acquired for wetland restoration, water retention, or similar purposes. Interim uses which require these chemicals will not be permitted.

benomyl	paraquat

D. Other pesticides which do not appear on the above lists may come up from time to time. These will be evaluated on a chemical-by-chemical basis and added to the appropriate category above.

E. *Any* pesticide, regardless of the above categories, shown to already be present in soil at or above the appropriate sediment guideline, may require additional restrictions. For example, copper is a metal which does not degrade in the environment and may already be present in some soils (e.g., orchards) at levels above the Florida Department of Environmental Protection's Sediment Quality Assessment Guideline (MacDonald, 1994). In this case, further use of copper compounds during the interim use period would have to be reduced or eliminated altogether. These situations will be evaluated on a case-by-case basis. Add: can't push over SQAGs.

IV. SOURCES OF INFORMATION

A. Publications

Casarett, L.J., M.O. Amdur and C.D. Klaasen (eds.). 1996. Casarett and Doull's Toxicology: The Basic Science of Poisons, 5th Edition. McGraw Hill.

1997 Farm Chemicals Handbook (Vol. 83). Meister Publishing Co., Willoughby, Ohio.

MacDonald, D.D. 1994. Approach to the Assessment of Sediment Quality in Florida Coastal Waters. Florida Department of Environmental Protection, Office of Water Policy, Tallahassee, Florida.

Milne, G.W.A. 1995. CRC Handbook of Pesticides. CRC Press, Boca Raton, Florida. 402 pp.

Shahane, A.H. 1999. Summary of Agricultural Pesticide Usage in Florida: 1995-98. Florida Department of Agriculture and Consumer Services, Tallahassee, Florida. 111 pp.

B. Online Databases

Environmental Fate Database, Syracuse Research Corporation, Syracuse, New York. http://esc.syrres.com/efdb.htm

Hazardous Substances Data Bank (HSDB), TOXNET, National Library of Medicine, Washington, D.C. http://toxnet.nlm.nih.gov/

Extension Toxicology Network (EXTOXNET), Oregon State University, Corvallis, Oregon. http://ace.orst.edu/info/extoxnet/ -

Table 1. Environmental and Toxicological Characteristics of Pecticides Considered in Establishing the No Application Period.

Pesticide	No Application	$T_{1/2}$ soil (days)		Persistence	5 X $T_{1/2}$	Class	Bird Kills?[1]	LD50 (rat, oral)	LC50 (fish)
	Period	median	max		(months)			mg/kg	mg/l
acephate	3 mo.	3	14		0.5	OP	YES	866 - 945	>1000
alachlor	3 mo.	14	133	6 wk - >1 yr	2.3	acetanilide		930 - 1350	(3.7)
aldicarb	6 mo.	19	990	1 - 15 d	3.2	carbamate	YES	1	1.5
atrazine	1 yr.	63.8	1898	73 d - 2 yr	10.6	triazine		1780	slightly toxic
azinphos-methyl	6 mo.	37.0	484		6.2	OP	YES	4.4 - 16	0.003
benomyl	Do Not Apply	270	360	15 d - 4 wk	45.0	carbamate		>10,000	.006 - 14
carbaryl	6 mo.	25.5	379.4	40 d	4.3	carbamate		246 - 283	28
carbofuran	6 mo.	29	334.2	56 d - 14.5 mo	4.8	carbamate	YES	8	0.24
chlorpyrifos	6 mo.	22.6	84		3.8	OP	YES	96 - 270	0.18
cyfluthrin	1 yr.	56.0	63.0		9.3	pyrethroid			.00068 - .022
diazinon	3 mo.	11.5	35	3 - 14 wk	1.9	OP	YES	1250	toxic
dicofol	2 yr.	60		>1 yr	10.0	OC		570 - 595	0.12 - 0.37
dimethoate	3 mo.	11	122		1.8	OP	YES	235	30.2
disulfoton	1 yr.	5.6	70.0	56 d - 2 yr	0.9	OP	YES	1.9 - 12.5	0.038
endosulfan	1 yr.	40.5	150	10 - 160 d	6.7	OC	YES	18 - 160	0.001
esfenvalerate	1 yr.	52.5	90		8.8	pyrethroid		458	.0002 - .001
ethoprop	6 mo.	19.5	84		3.3	OP	YES	61.5	
ethyl parathion	6 mo.	22	2957.2	20 d - >16 yr	3.7	OP	YES	2	1.5
fenamiphos	1 yr.	43.5	470.2	92 d	7.3	OP	YES	2 - 19	0.11 - 9.6
fonofos	1 yr.	42.5	93.3		7.1	OP	YES	8 - 17.5	0.05
malathion	3 mo.	1.7	6.0		0.3	OP		5500	200
methamidophos	3 mo.	4.8	12.0		0.8	OP	YES	16 - 21	25 - 100
methidathion	3 mo.	7.0	23.0		1.2	OP		25 - 54	.002 - .014
methyl parathion	3 mo.	15.0	915.6	3 - 5 mo.	2.5	OP	YES	6 - 50	1.9 - 8.9
oxamyl	3 mo.	12.5	50		2.1	carbamate	YES	5.4	4.2 - 17.5
paraquat	Do Not Apply	1000	2409		166.7	bipyridyl		150	13 - 32
permethrin	6 mo.	34	38		5.7	pyrethroid		430 - 4000	.0018 - .0054
phorate	6 mo.	23.3	167.6	2 wk - 4.5 mo	3.9	OP	YES	2 - 4	0.002
propargite (omite)	no data					??		1480 - 2200	.031 - .100
terbufos	6 mo.	19.5	151.8		3.2	OP	YES	1.3 - 1.6	.001 - .39
trichlorfon	3 mo.	0.97	140	8 d - 1.5 mo.	0.2	OP		450 - 650	.26 - 2.5
trifluralin	2 yr.	88.2	405	157 d - >40 wk	14.7	dinitroaniline		>10,000	.02 - 3.4

[1]YES in this column indicates pesticides that have caused documented die-offs of migratory birds.

Appendix A. Reported Soil Half-Lives (in days) for South Florida Pesticides.*

alachlor	aldicarb	atrazine	azinphos-methyl	benomyl	carbaryl	carbofuran	chlorpyrifos	cyfluthrin	diazinon	dicofol	dimethoate	disulfoton	endosulfan
Lit. $T_{1/2}$ (d)	Lit. $T_{1/2}$ (d)	Lit. $T_{1/2}$ (d)	Lit. $T_{1/2}$ (d)	Lit. $T_{1/2}$ (d)	Lit. $T_{1/2}$ (d)	Lit. $T_{1/2}$ (d)	Lit. $T_{1/2}$ (d)	Lit. $T_{1/2}$ (d)	Lit. $T_{1/2}$ (d)	Lit. $T_{1/2}$ (d)	Lit. $T_{1/2}$ (d)	Lit. $T_{1/2}$ (d)	Lit. $T_{1/2}$ (d)
15	9.9	15	5	180	22	26	81	56	7	60	2.5	1	32
7	23	300	484	360	12	110	28	63	14		4	4	150
14	990	1898	21		25.5	14	84	Calc. $T_{1/2}$	35		122	7	39
4	7	53	68		8	28	7	42.1	11.5		7	56	42
49	12	113	10		12	60	18		6.3		11	70	Calc. $T_{1/2}$
7.8	23	28	30		Calc. $T_{1/2}$	75	11.5				29	Calc. $T_{1/2}$	42.0
Calc. $T_{1/2}$	2	181	Calc. $T_{1/2}$		379.4	30	25.1				36	4.3	24.2
133.3	15	115	44.0		195.2	60	8.7				Calc. $T_{1/2}$	3.1	
	54	48	51.3		51.7	28	Calc. $T_{1/2}$				6.6	10.5	
	20	357			43.8	43	20.1				53.1		
	46	78				53	30.0						
	18	20				8							
	154	58				10							
	60	67				14							
	9	Calc. $T_{1/2}$				73							
	12	84.0				Calc. $T_{1/2}$							
	20	48.3				9.7							
	361	20.0				2.8							
	Calc. $T_{1/2}$	10.0				334.2							
	8.9	48.3				113.4							
	2.0	127.5				22.6							
		56.7											
		26.4											
		134.3											
		279.9											
		149.9											
		36.5											
		89.7											
		23.4											
		92.3											
		60.6											

*Values were taken directly from the literature or calculated from degradation rates.

Appendix A. Reported Soil Half-Lives (in days) for South Florida Pesticides.*

esfenvalerate	ethoprop	ethyl parathion	fenamiphos	fonophos	malathion	methamidophos	methidathion	methyl parathion	oxamyl	paraquat	permethrin	phorate
Lit. $T_{1/2}$ (d)	Lit. $T_{1/2}$ (d)	Lit. $T_{1/2}$ (d)	Lit. $T_{1/2}$ (d)	Lit. $T_{1/2}$ (d)	Lit. $T_{1/2}$ (d)	Lit. $T_{1/2}$ (d)	Lit. $T_{1/2}$ (d)	Lit. $T_{1/2}$ (d)	Lit. $T_{1/2}$ (d)	Lit. $T_{1/2}$ (d)	Lit. $T_{1/2}$ (d)	Lit. $T_{1/2}$ (d)
15	25	7	50	40	1	1.9	5	4	11	1000	30	82
90	3	11	2.1	30	6	4.8	7	45	15	2409	38	2
	56	112	4	45	Calc. $T_{1/2}$	6.1	23	10	6	Calc. $T_{1/2}$		6
	14	182	11	18	4.3	12		15	14	268.7		30
	84	22	Calc. $T_{1/2}$	82	2.3	Calc. $T_{1/2}$		Calc. $T_{1/2}$	4			69
	12	23	13.1	Calc. $T_{1/2}$	1.0	2.7		4.3	33			Calc. $T_{1/2}$
	16	Calc. $T_{1/2}$	138.2	93.3	0.3			915.6	8			167.6
	73	12.1	462.8	75.0				203.1	50			23.3
	Calc. $T_{1/2}$	34.2	470.2	28.5								7.5
	23.0	2.4	43.5									98.2
	12.6	4.9										20.8
		16.2										1.6
		131.5										
		20.0										
		2957.2										
		224.9										

*Values were taken directly from the literature or calculated from degradation rates.

Appendix A. Reported Soil Half-Lives (in days) for South Florida Pesticides.*

terbufos	trichlorfon	trifluralin
Lit. $T_{1/2}$ (d)	Lit. $T_{1/2}$ (d)	Lit. $T_{1/2}$ (d)
5	1.1	38
22	140	61
16.9	0.6	211
86.6	0.8	405
12.8		Calc. $T_{1/2}$
66.5		66.7
10		109.8
4.5		
Calc. $T_{1/2}$		
22.5		
12.1		
151.8		
97.8		

*Values were taken directly from the literature or calculated from degradation rates.

Appendix B. Half-life Calculation Worksheet.

Atrazine	Lit. $T_{1/2}$	units	$T_{1/2}$ (days)	% degraded	time	units	Calc. $T_{1/2}$	$T_{1/2}$ (days)
	0.5	mo	15	50	12	wk	12.0	84.0
	10	mo	300	70	12	wk	6.9	48.3
	5.2	yr	1898	50	20	d	20.0	20.0
	53	d	53	75	20	d	10.0	10.0
	113	d	113	70	12	wk	6.9	48.3
	28	d	28	29	9	wk	18.2	127.5
	181	d	181	60	75	d	56.7	56.7
	115	d	115	86	75	d	26.4	26.4
	48	d	48	71	8	mo	4.5	134.3
	357	d	357	13.8	60	d	279.9	279.9
	78	d	78	75	10	mo	5.0	149.9
	20	d	20	85	100	d	36.5	36.5
	58	d	58	90	298	d	89.7	89.7
	67	d	67	93	3	mo	0.8	23.4
				86	262	d	92.3	92.3
				95	262	d	60.6	60.6

Trichlorfon	Lit. $T_{1/2}$	units	$T_{1/2}$ (days)	Aldicarb	K_{el}	units	Calc. $T_{1/2}$
	1.1	d	1.1		0.078	d^{-1}	8.9
	140	d	140		0.35	d^{-1}	2.0
	14	hr	0.6				
	20	hr	0.8				

Phorate	Lit. $T_{1/2}$	units	% degraded	time	units	Calc. $T_{1/2}$
	82	d	18	48	d	167.6
	2	d	76	48	d	23.3
	6	d	90	25	d	7.5
	30	d	47	90	d	98.2
	69	d	95	90	d	20.8
			95	7	d	1.6

Carbaryl	Lit. $T_{1/2}$	units	% degraded	time	units	Calc. $T_{1/2}$	$T_{1/2}$ (days)
	22	d	12	10	wk	54.2	379.4
	12	d	22	10	wk	27.9	195.2
	25.5	d	80	120	d	51.7	51.7
	8	d	85	120	d	43.8	43.8
	12	d					

Methyl Parathion	Lit. $T_{1/2}$	units	% degraded	time	units	Calc. $T_{1/2}$	$T_{1/2}$ (days)
	4	d	99.5	33	d	4.3	4.3
	45	d	64	45	mo	30.5	915.6
	10	d	99	45	mo	6.8	203.1
	15	d					

Appendix B. Half-life Calculation Worksheet.

Alachlor	% degraded	time	units	Calc. $T_{1/2}$	$T_{1/2}$ (days)
	85	1	yr	0.4	133.3
Carbofuran	% degraded	time	units	Calc. $T_{1/2}$	$T_{1/2}$ (days)
	95	42	d	9.7	9.7
	97	14	d	2.8	2.8
	7	5	wk	47.7	334.2
	60	5	mo	3.8	113.4
	99	5	mo	0.8	22.6
Chlorpyrifos	% degraded	time	units	Calc. $T_{1/2}$	$T_{1/2}$ (days)
	62	4	wk	2.9	20.1
	50	30	d	30.0	30.0
Cyfluthrin	% degraded	time	units	Calc. $T_{1/2}$	$T_{1/2}$ (days)
	90	140	d	42.1	42.1
Dimethoate	% degraded	time	units	Calc. $T_{1/2}$	$T_{1/2}$ (days)
	77	2	wk	0.9	6.6
	98	10	mo	1.8	53.1
Disulfoton	% degraded	time	units	Calc. $T_{1/2}$	$T_{1/2}$ (days)
	68	1	wk	0.6	4.3
	79	1	wk	0.4	3.1
	90	5	wk	1.5	10.5
Endosulfan	% degraded	time	units	Calc. $T_{1/2}$	$T_{1/2}$ (days)
	50	42	d	42.0	42.0
	70	42	d	24.2	24.2
Ethoprop	% degraded	time	units	Calc. $T_{1/2}$	$T_{1/2}$ (days)
	19	1	wk	3.3	23.0
	32	1	wk	1.8	12.6
Ethyl parathion	% degraded	time	units	Calc. $T_{1/2}$	$T_{1/2}$ (days)
	96	8	wk	1.7	12.1
	20	11	d	34.2	34.2
	96	11	d	2.4	2.4
	95	3	wk	0.7	4.9
	95	10	wk	2.3	16.2
	10	20	d	131.5	131.5
	50	20	d	20.0	20.0
	3	130	d	2957.2	2957.2
	33	130	d	224.9	224.9

Appendix B. Half-life Calculation Worksheet.

Fonophos	% degraded	time	units	Calc. $T_{1/2}$	$T_{1/2}$ (days)
	59	4	mo	3.1	93.3
	67	4	mo	2.5	75.0
	64	6	wk	4.1	28.5

Malathion	% degraded	time	units	Calc. $T_{1/2}$	$T_{1/2}$ (days)
	80	10	d	4.3	4.3
	95	10	d	2.3	2.3
	50	24	hr	24.0	1.0
	90	24	hr	7.2	0.3

Paraquat	% degraded	time	units	Calc. $T_{1/2}$	$T_{1/2}$ (days)
	13	54	d	268.7	268.7

Terbufos	% degraded	time	units	Calc. $T_{1/2}$	$T_{1/2}$ (days)
	35	14	d	22.5	22.5
	80	28	d	12.1	12.1
	12	4	wk	21.7	151.8
	18	4	wk	14.0	97.8

Trifluralin	% degraded	time	units	Calc. $T_{1/2}$	$T_{1/2}$ (days)
	85	0.5	yr	0.18	66.7
	90	1	yr	0.30	109.8

Fenamiphos	% degraded	time	units	Calc. $T_{1/2}$	$T_{1/2}$ (days)
	94.6	55	d	13.1	13.1
	24.1	55	d	138.2	138.2
	9	63	d	462.8	462.8
	9.8	70	d	470.2	470.2
	67.2	70	d	43.5	43.5

Azinphos-methyl	% degraded	time	units	Calc. $T_{1/2}$	$T_{1/2}$ (days)
	50	44	d	44.0	44.0
	93	197	d	51.3	51.3

Methamido-phos	% degraded	time	units	Calc. $T_{1/2}$	$T_{1/2}$ (days)
	92	10	d	2.7	2.7

APPENDIX B

APPENDIX B
SITE VERIFICATION CHECKLIST

United States Sugar Corporation
Palm Beach, Hendry, and Glades Counties
State of Florida

Best Management Practices (BMP) Site Verification Checklist

Tract No.:
SFWMD Representative(s):
Property Representative(s):
Inspection Date:

BMP	Description/Comment	Implementation Verified	Additional Attention Required
Property Use and Structures			
Housekeeping			
General Site -			
Storage Areas -			
Additional Observations -			
Employee Training			
Schedule -			
Topics -			

Additional Observations -			
Hazardous Material/ Chemical Use			
Chemicals Used -			
Application Type -			
Application Schedule -			
Material Records -			
Additional Observations:			
Petroleum Products			
Product Use -			
Pump Station(s) -			
Storage Location(s) -			
Additional Observations:			
Chemical Storage			
Storage Location -			
Building/Area Type -			
Pump Station(s) -			

Additional Observations:			
Mixing & Loading Areas			
Area Description -			
Area Observations -			
Additional Observations:			
Waste Storage and Disposal			
Waste Types -			
Storage Location -			
Waste Disposal -			
Waste Disposal Records -			
Additional Observations:			
Water Management			
Observations -			
Water Mgmt Controls -			
Weather Monitoring -			
Additional Observations:			
Erosion/Sediment Controls			
Erosion Controls -			

Sediment Controls -			
Additional Observations:			
Exotic Vegetation Management			
Observations -			
Physical Controls -			
Biological Controls -			
Chemical Controls -			
Additional Observations:			
General Field Notes			

Notes:

N/A - Not Applicable

APPENDIX C

APPENDIX C
EMERGENCY RESPONSE and CHEMICAL HAZARD INFORMATION PHONE NUMBERS

Emergency Reporting
For Ambulance, Fire, or Police **Dial 911**

State Warning Point 24hrs. Toll Free 1-800-320-0519
(Department of Community Affairs, or (850) 413-9911
Division of Emergency Management)

National Response Center 24hrs. Toll Free 1-800-424-8802
(Federal law requires that anyone who releases into the environment a reportable quantity of a hazardous substance [including oil when water is or may be affected] or a material identified as a marine pollutant, must immediately notify the NRC).

DEP Emergency Response, 24 hrs. Toll Free **1-800-342-5367**

HELP LINE NUMBERS

Chemical hazard information and regulatory questions

- **CHEMTREC HOT LINE (Emergency only) 24 hrs** Toll Free 1-800-424-9300
- SARA Title III help line Toll Free 1-800-535-0202
- CERCLA / RCRA help line Toll Free 1-800-424-9346
- Pesticide Container Recycling Program (352) 392-4721
  Pesticide Information Officer at University of Florida

COUNTY COOPERATIVE EXTENSION OFFICES

Pam Beach County	559 N. Military Trail West Palm Beach, FL 33415	(561) 233-1700
Hendry County	1085 Pratt Boulevard Dallas B Townsend Agricultural Center Labelle, FL 33935	(863) 674-4092
Glades County	900 US Highway 27 SW Moore Haven, FL 33471	(863) 946-0244

STATE OF FLORIDA AGENCIES

Florida Department of Agriculture and Consumer Services

Bureau of Pesticides	(850) 487-0532
Bureau of Compliance Monitoring	(850) 488-3314
Division of Agriculture and Environmental Services	(850) 488-3731

Florida Department of Environmental Protection

FDEP Stormwater/Nonpoint Source Management Section (Tallahassee)	(850) 488-3605
FDEP Hazardous Waste Management Section (Tallahassee)	(850) 488-0300
FDEP District offices - West Palm Beach	(561) 681-6800

Florida Fish and Wildlife Conservation Commission
620 South Meridian Street
Tallahassee, FL 32301
(850) 488-4066 or
(850) 488-4069

Water Management Districts
South Florida Water Management District (West Palm Beach)
(561) 686-8800 or
1-800-432-2045

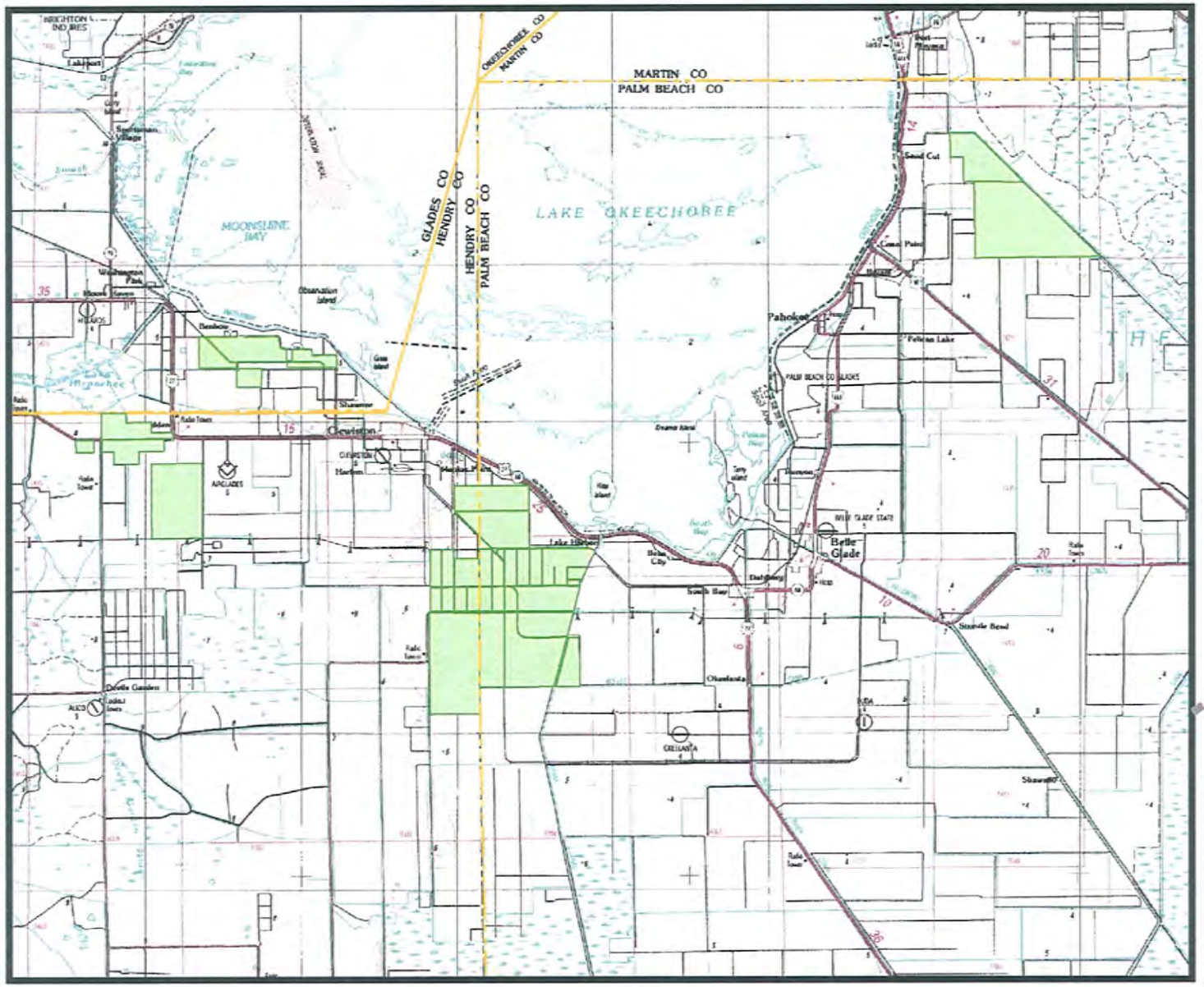
University of Florida (Gainesville)
Pesticide Information Office
(352) 392-4721
Agricultural Law Policy Office
(352) 392-1881

UNITED STATES AGENCIES
EPA National Offices & Numbers
Office of Water
(202)-382-5700
4604, 401 M Street, SW
Washington, DC 20460
(Provides Information on Clean Water Act and related water pollution regulations)

Florida Administrator of EPA Pesticide Registration
Bureau of Pesticides/ Division of Inspection
(850) 487-2130
Dept. of Agriculture and Consumer Services
3125 Conner Blvd., MD-2
Tallahassee, FL 32399-1650

National Pesticide Telecommunications Network
Provides information on pesticides and pesticide poisonings.
1-800-858-7378
Operating 24 hours a day, 365 days a year.

FIGURE 1



- PARCELS USED FOR CULTIVATION OF SUGAR CANE

UNITED STATES SUGAR CORPORATION
111 PONCE DE LEON AVENUE
CLEWISTON, FL.

JOB NO.: 38617-027 DATE: SEPTEMBER 2008

SUGAR CANE PARCEL LOCATION VICINITY MAP

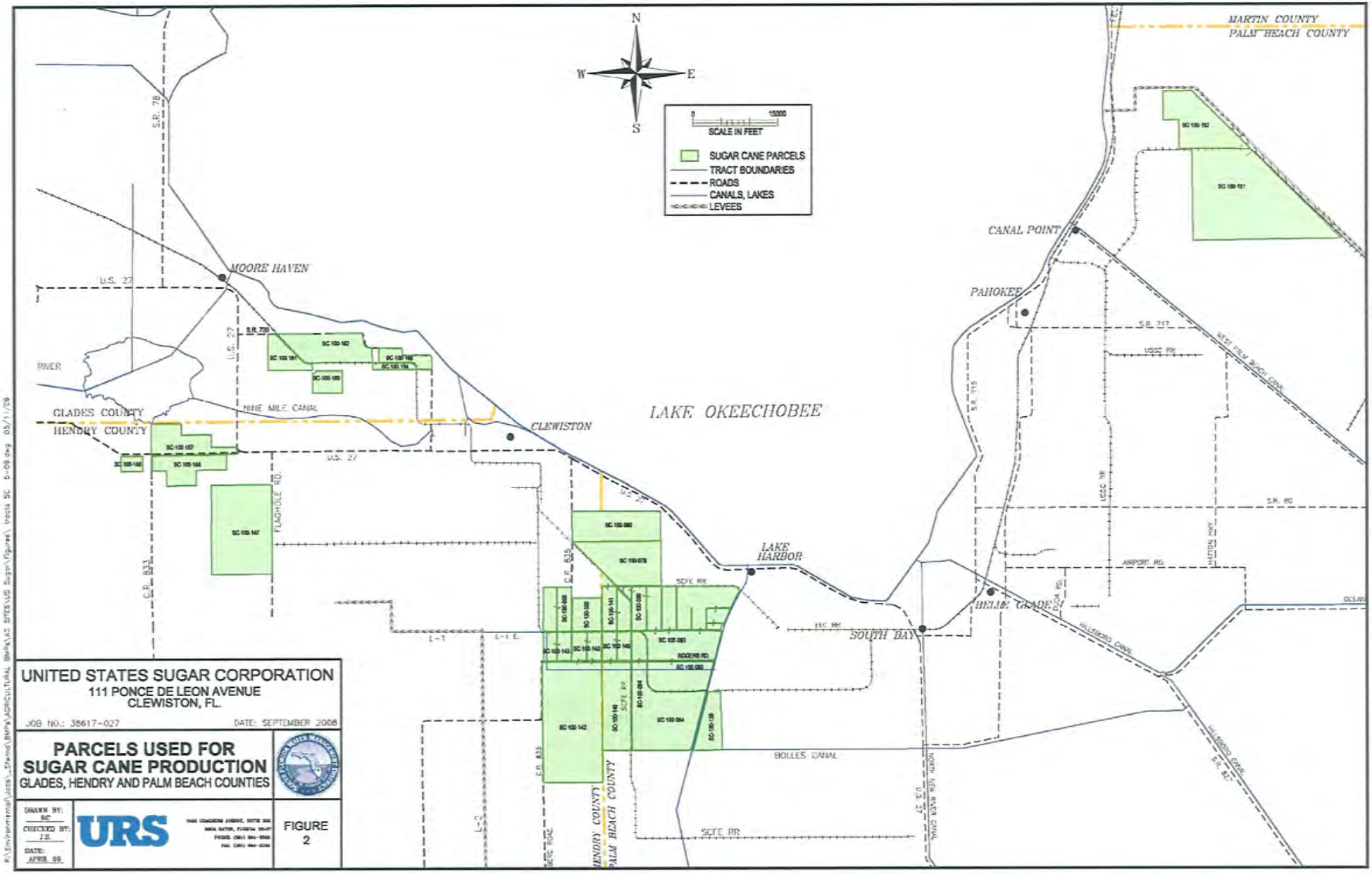
DRAWN BY: RC
CHECKED BY: JS
DATE: DEC 08

URS

FIGURE 1

R:\Environmental\Jobs\...\Permit Data\AGRICULTURAL BMPs\A2 SITES\US Sugar\Figures\ topo SC 8-08.dwg 08/11/09

FIGURE 2



UNITED STATES SUGAR CORPORATION
111 PONCE DE LEON AVENUE
CLEWISTON, FL.

JOB NO.: 38617-027 DATE: SEPTEMBER 2008

PARCELS USED FOR SUGAR CANE PRODUCTION

GLADES, HENDRY AND PALM BEACH COUNTIES

DRAWN BY: RC
CHECKED BY: J.H.
DATE: APRIL 09

URS

FIGURE 2

P:\Environmental\Jobs_5\Fermo\BMPs\AGRICULTURAL BMPs\US SUGAR\Figures\ Tracts SC 5-09.dwg 05/11/09

SCHEDULE 3.2-B

BEST MANAGEMENT PRACTICES PLAN
SUGAR CANE PRODUCTION

UNITED STATES SUGAR CORPORATION
PALM BEACH, HENDRY, AND GLADES COUNTIES, FLORIDA

Prepared for

South Florida Water Management District
3301 Gun Club Road
West Palm Beach, Florida 33406

May 12, 2009

Prepared by

URS Corporation
7800 Congress Avenue, Suite 200
Boca Raton, Florida 33487

URS

May 12, 2009

Mr. Robert Taylor
Lead Environmental Engineering Specialist
Land Management and Land Acquisition Division
South Florida Water Management District
3301 Gun Club Road
West Palm Beach, Florida 33406

Subject: **Environmental Best Management Practices Plan-Sugar Cane Production**
United States Sugar Corporation
Palm Beach, Hendry, and Glades Counties
State of Florida
Job # 38617-027

Dear Mr. Taylor,

URS Corporation (URS) is pleased to present this Environmental Best management Practices (BMP) Plan for the United States Sugar Corporation (USSC) sugar cane production properties in Palm Beach, Hendry, and Glades Counties, Florida.

It is URS' understanding that as the property owner, the South Florida Water Management District (District) desires to have in place a set of general environmental BMP's for the sugar cane operations that are designed to maintain/protect water quality in accordance with the State's water quality standards, maintain the soil and water quality at the site which will not prohibit the District from using property as a water attenuation reservoir in the near future, and that will concurrently allow for continued economically-viable agricultural production on the site. This BMP plan is designed to meet these expectations by providing guidance to the USSC property on environmental preventative measures to be proactively implemented.

Sincerely,
URS Corporation

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1.0 OVERVIEW

1.1 BACKGROUND

The South Florida Water Management District (District) has acquired approximately 180,000 acres of the United States Sugar Corporation (USSC) properties in Palm Beach, Hendry, and Glades Counties, Florida for future restoration purposes such as water storage reservoirs and wetlands. **Figure 1** illustrates the USSC properties. Of the 180,000 acres, an estimated 150,000 acres is used for the cultivation of sugar cane. **Figure 2** illustrates the tracts of land in eastern Glades, eastern Hendry, and Palm Beach Counties that are utilized for the cultivation of sugar cane. Additionally, portions of the 150,000 acres are subleased each year for the cultivation of vegetables. The vegetables that are typically grown are corn, beans, and watermelons. This Environmental Best Management Practices (BMP) Plan shall be implemented by future tenants of the District that engage in sugar cane and vegetable production on portions of the acquired properties.

During the interim period (from acquisition to construction/land conversion), the District intends to utilize the property for continued agricultural operations primarily for the cultivation of sugar cane. In general, this BMP requirements document is not regulatory or enforcement based (as opposed to any existing or future permit that may contain BMP requirements); however, failure of a tenant to implement this BMP Plan will constitute a breach of the tenant's lease with the District. BMPs are production systems and management strategies scientifically shown to minimize adverse water quality and other environmental impacts of sugar cane production. BMPs can be defined as those operational procedures designed to achieve greatest agronomic efficiency in food and fiber production, while limiting the off-site effects of agricultural operations and maintaining an economically viable farming operation. All BMPs must protect the environment and be economically viable. A small percentage of the 150,000 acres, an estimated 2% to 4%, is used for vegetable growing as part of the sugar cane crop rotation. These acres are subleased to independent farmers who grow the vegetables. In the event that USSC plans to sub-lease large portions/substantial additional acres for vegetables or other crops not associated with the typical crop rotation, the District must be notified prior to leasing the acreage. It will be the District's lessee's responsibility to insure that its sub-tenant complies with the BMP Plan.

There are several sources of research that have been used to develop BMPs for sugar cane production in Florida. Primary sources include the United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS), University of Florida/Institute of Food and Agricultural Sciences (IFAS), Environmental Protection Agency (EPA), Florida Department of Environmental Protection (FDEP), and Florida Department of Agriculture and Consumer Services (FDACS). This document cites pertinent documentation from these sources that may guide the implementation, evaluation, verification and validation of each BMP.

The proposed acquisition areas have been cultivated since the 1920s. Initially vegetables were cultivated. Beginning in the 1930s, the predominant crop was sugar cane. Maintenance buildings with chemical storage areas are strategically spaced throughout the acquisition areas, as well as diesel powered pump stations and re-fueling areas. A railway system located throughout the properties is used to transport the sugar cane to the mills. Rail sidings, which are used to load the harvested sugar cane onto rail cars, are strategically placed along the railway system. Agrochemical application is conducted using mobile

equipment and also applied aerially, and the agrochemicals are stored in designated areas at the maintenance buildings. For tracts that are leased for vegetable cultivation, the agrochemicals are stored off-site and transported to the vegetable growing are on an as-need basis. USSG property personnel indicated there have been no central burn pits and the paper, boxes and cartons generated as part of the farming operations were burned in many small areas throughout the properties. Agricultural air strips are located on several properties.

1.2 ENVIRONMENTAL SITE ASSESSMENT (ESA)

Phase I and Phase II Environmental Site Assessment (ESA) activities were conducted on the property in August and September 2008 by Professional Services Inc. (PSI). Identified areas of potential point sources associated with the sugar cane operation are primarily:

- Chemical Storage and/or Maintenance Areas
- Airplane Landing Strips
- Equipment Staging Areas
- Diesel Powered Pump Stations
- Fuel Storage / Re-Fueling Areas

Section 2.0 provides descriptions of a variety of environmental BMPs as part of the sugar cane and vegetable operations. Although all BMPs are important with the need for diligent on-going implementation, particular attention needs to be addressed to the following:

- Pump Stations
- Chemical Storage Areas
- Copper Based Nutrients

Given below is a summary of the observations made during the Phase I ESA, as well as the results of the Phase II ESA at the above referenced areas/issues and URS' recommendations to address the issues.

- Diesel powered pump stations with aboveground storage tanks (ASTs) used to store diesel fuel were observed on the properties. The pump stations are used to control water in the cultivated fields. Soil staining and/or petroleum impacted soils were identified at most of the pump stations. **URS recommends implementing preventative measures for petroleum spills and diesel AST leaks. This should include repairing any leaks and use of absorbent material when leaks and/or spills occur. URS also recommends that site inspections be routinely conducted when the pump station (s) are in operation to verify the pump stations are being properly maintained and in compliance.**

- Chemical and equipment storage areas were observed on the properties. Areas of petroleum and agrochemical stained soil and stressed vegetation were observed at numerous chemical and equipment storage areas. **URS recommends improving housekeeping at the storage areas. This should include proper handling and storage of agrochemicals and use of absorbent at the equipment storage areas. URS also recommends monthly site inspections to verify the storage areas are being properly maintained.**

- During the Phase I ESA, PSI identified copper based nutrients from the USSC pesticide application records. Due to these copper based nutrients, PSI analyzed for copper in the sugar cane cultivation areas during the Phase II ESA. PSI divided the sugar cane cultivation area into 40-acre grids and sampled approximately 20% of these 40-acre grids that were historically and currently cultivated with sugar cane. An eight point composite sample was collected from each grid with each aliquot representing approximately 5-acres. All aliquots were collected from a depth of 0 to 6-inches bls using a stainless steel sample barrel. The Phase II ESA sampling identified areas of elevated copper in the sugar cane cultivation areas copper above the Service provisional Snail Kite threshold level of 85 milligrams per kilogram (mg/kg).

- URS identified 105, 40-acre grids with copper concentrations ranging from 70 mg/kg to 85 mg/kg, and 104, 40-acre grids with copper concentrations above 85 mg/kg. The current rates of application and amounts of copper based nutrients were review that have been applied on the USSC property. Utilizing this information, a mass balance equation was developed in order to determine if additional acreage would be impacted by copper based on the current application activities. URS determined that copper could potentially increase in the soils, per application, at a rate of 2.08 mg/kg per acre. Based on this application rate, and the fact that the property is leased through 2016, 12, 40-acre grids have the potential to accumulate copper above the Service's interim value for copper of 85 mg/kg during the lease agreement. However, most of the 12, 40-acre grids are located adjacent to soils with copper concentrations exceeding 85 mg/kg and/or are co-located with historically applied agrochemicals (organochlorine pesticides) that are targeted for abatement. **The current nutrient application regiment is acceptable over most areas. Based on the Phase II findings on elevated copper concentrations, no copper should be applied on the 4,160-acres. URS recommends sampling select areas within the cultivated fields every year in order to monitor the copper concentrations in the soil. Section 3 gives details of the sampling and compliance plan. In the event that USSC plans to increase the applications rate of the copper based nutrients, URS recommends that USSC discuss the application increase with the District prior to implementing.**

1.3 OBJECTIVE

Given below are sets of guidelines and requirements proposed for the day-to-day sugar cane farming operations:

- Continued economically-viable sugar cane operations on the properties that is agreeable for implementation by the lessee/tenant during the interim use,

- Maintain/protect water quality in accordance with the State's water quality standards; prevent exceedances of applicable State soil or groundwater Cleanup Target Levels" (CTLs) as set forth in Tables 1 and 2 of 62-777, F.A.C.; and implement such measures as necessary to maintain existing levels of pollutants and not interfere with District's intent to use the premises as a future water resource project.
- Comply with State regulations that are applicable to the sugar cane operations that result in conditions that will maintain the soil and water quality at the site which will not prohibit the District from using the property as a water attenuation project area at the end of the interim use period.
- Comply with permits/consent agreements issued by the District approving the site specific BMP plan for Water Management, Nutrient Management and Fertilizing, and Erosion/Sediment Control and the Discharge Monitoring Plan for nutrients (phosphorus and nitrogen).

A list of agrochemicals currently used was provided to the District. The chemical usage list is included in *Section 2.6.1 Acceptable Agrochemicals and No Application Periods*. In the event that changes are made to the agrochemical list, a revised list should be provided to the District and should consist of a detailed specific agrochemical and pesticide product list, to include the quantity used, rates of application, and an evaluation of crop areas for effectiveness of the pesticides.

The U.S. Fish and Wildlife Service (Service) document titled "Derivation of No Application Periods for Interim Use Pesticides" defines the no application period as *the period of time prior to the conversion of the agricultural land to conservation purposes (i.e. flooding to create wetlands) during which a particular pesticide hazardous to fish and/or wildlife should not be applied, in order to allow adequate time for breakdown of pesticide residues before use of the land by the Service trust resources. This period of time was defined as five times the median half-life, representing 97 percent degradation.* A copy of this document is included in **Appendix A.**

1.4 STANDARDIZED BMP CHECKLIST

The District's intent is to ensure consistency of BMP implementation and future verifications on two levels:

1. Consistent BMP verification for each visit to the USSC properties; and,
2. Consistent BMP verification for site visits to similar land use operations.

In some cases, previously developed District and USSC BMP plans were earlier generation versions focused on addressing specific issue areas (i.e., phosphorous control) while possibly not addressing additional areas of the District's potential concern (i.e., petroleum management, chemical usage). In addition, there may be supplementary areas of common good management practices, such as general site condition housekeeping, that are to be included in all BMP site verifications.

An example of the Standardized *BMP Site Verification Findings Summary* checklist is provided in **Appendix B,** as a supplement to any previously developed site-specific BMP Plan. The checklist is

intended to serve as an additional guide to prepare for BMP site verification by the District representatives. The checklist attempts to identify BMP verification aspects which will require field observations and verification aspects which will consist of records review.

The following matrix and equivalent points table provides a *quick-glance* summary of the BMPs established for the agricultural operation. Further discussion of each BMP and key points to assist with advance preparation of BMP site verification are provided in **Section 2**.

Best Management Practices Checklist

United States Sugar Corporation
Palm Beach, Hendry, and Glades Counties
State of Florida

BMP Group/BMP Name	Site Verification		Training & Communications
	Observations	Records	
GENERAL			
• *Education-Employee Training* • *Overall Operations 'Housekeeping'*	✓	✓	✓
EXOTIC VEGETATION CONTROL			
Upland Exotic Vegetation Control • *Control and eradicate to the extent practicable Category I and II exotic/invasive pest plants*	✓		✓
Aquatic Exotic Vegetation Control • *Control and eradicate to the extent practicable Class I and II prohibited aquatic plants*	✓		✓
EARTHWORK			
No unpermitted earthwork, excluding ditch and routine maintenance. All non-routine maintenance requires contacting the District for approval.	✓	✓	✓
PESTICIDE & HERBICIDE MANAGEMENT			
Allowable agrochemical list and *No Application Period*		✓	✓
Pesticide & Herbicide Management • *Pesticide record keeping* • *Read and understand label* • *Pesticide storage*		✓	✓
Pesticide & Herbicide Application Optimization • *Integrated pest management* • *Application timing* • *Customized applications* • *Maintain soil pH in optimum range* • *Pesticide selection*	✓		✓
Pesticide & Herbicide Handling and Placement • *Reduce spray drift* • *Equipment calibration and maintenance* • *Pesticide spill management* • *Pesticide application equipment wash water* • *Prevent backflow to water sources* • *Mixing and loading activity locations* • *Pesticide container management* • *Excess pesticide mixture* • *Excess formulation (raw product)*	✓		✓
COPPER			
Minimize Use of Copper	✓	✓	✓
PETROLEUM & HAZARDOUS WASTE MANEGEMENT			
Gasoline and Diesel Fuel Storage & Containment • *Site equipment* • *Fuel delivery*	✓		✓

BMP Group/BMP Name	Site Verification		Training & Communications
	Observations	Records	
Farm Equipment Cleaning and Maintenance • *General equipment cleaning* • *Solvents and degreasers* • *Paint* • *Used oil, coolant and lead-acid batteries*	✓		✓

Nutrient (Phosphorus and Nitrogen) Load Reduction Best Management Practices
BMP Description and Equivalent Points Reference Table

As provided in **Schedule 3.1**, a separate District-approved BMP Plan is required for each land use or crop for nutrient (phosphorus and nitrogen) load reduction. BMP Plans shall be implemented across the entire farm acreage (drainage area) with individual BMPs consistently implemented during the water year across each land use (crop) area, including temporary, rotational, and cover crops (e.g., corn, watermelons, vegetables) The BMP Plans shall include BMPs from the following categories: water management, nutrient control practices, and particulate matter and sediment controls. Nutrient control practices at a minimum shall include spill prevention, soil testing, and fertilizer application control. The table below provides an array of Nutrient BMPs available for selection by operators. However, operators may propose other Nutrient BMPs to meet the minimum required BMP equivalent points for review and approval by the District.

BMP	PTS	DESCRIPTION
NUTRIENT CONTROL PRACTICES		MINIMIZES THE MOVEMENT OF NUTRIENTS OFF-SITE BY ENSURING RECOMMENDED APPLICATION RATES AND CONTROLLED PLACEMENT OF APPLICATION
Nutrient Application Control	2 ½	Uniform and controlled boundary application of nutrients with a minimum 4' setback from canals with no overlapping application for each application method (e.g. banding at the root zone or side-dressing, pneumatic controlled-edge application such as AIRMAX); fertilization through low volume irrigation system applied at root zone (fertigation); controlled placement by fertilization under plastic near root.
Nutrient Spill Prevention	2 ½	Formal spill prevention protocols (storage, handling, transfer, and education/instruction).
Manage Successive Vegetable Planting to Minimize Phosphorous (P)	2 ½	Avoid successive planting of vegetables or other crops having high P needs to avoid P build up in soils. Includes successive planting with no successive P application.
Recommended Nutrient Application based on Plant Tissue Analysis	2 ½ 5	Avoid excess application of P by determining plant nutrient requirements for adjustments during next growing season (crop specific). Pastures with Bahiagrass – Plant tissue analysis along with soil test is required to make nutrient application recommendation.
Recommended Nutrient Application based on Soil Testing	5	Avoid excess nutrient application by determining P requirements of soil and follow standard recommendations for application rates (crop specific).
Split Nutrient Application	5	More efficient plant uptake of P by applying small portions of total recommended P at various times during the growing season. Not to exceed total recommendation based on soil test.
Slow Release P Fertilizer	5	Avoid flushing excess P from soil by using specially treated fertilizer that releases P to the plant over time.

Reduce P Fertilization	5	Reduce the P application rate by at least 30% below standard recommendations based on soil tests and development of site – specific (optimized) recommendations or application methods. Provide basis for reduction credit.
No Nutrients Imported Via Direct Land Application	20	No Application of P, in any form, to the soil for amendments or plant nutrients. (Native and Semi-improved Range can claim this BMP and still apply fertilizer at maintenance, or less than optimum production levels, as a grass supplement every 6-8 years.)
No Nutrients Imported Indirectly Through Cattle Feed	15	No P import to the basin through cattle feed (note: only native range can use mineral supplements or molasses and still meet this BMP)
Nutrient Management Plan	5 - 25	Managing the amount, source, placement, form, and timing of the application of nutrients on lands with cattle operations. See Rule 40E-63.402 (2)

BMP	PTS	DESCRIPTION
WATER MANAGEMENT PRACTICES		MINIMIZES THE QUANTITY OF OFF-SITE DISCHARGES WHICH CARRY NUTRIENTS DOWNSTREAM
½ Inch Detained 1 Inch Detained	5 10	Delayed discharge (based on measuring daily rain events using a rain gage).
Improvements to Water Management System Infrastructure to Further Increase Water Quality Treatment by Delayed or Minimized Discharge	5	Recirculation of water inside farm boundaries to improve WQ prior to off-site discharge, includes: fallow field flood water with no direct discharge (instead allow to "drain" via evapotranspiration, seepage, use as irrigation water); or Increasing water detention using properly constructed canal berms.
Low Volume Irrigation	5	Use of low volume irrigation methods, e.g. drip irrigation, microjet irrigation.
Approved and Operational Surface Water Reservoir (Fully Certified)*	20	Properly permitted, constructed and maintained storage system meeting specified Environmental Resource Permit (ERP) Basis of Review criteria (version in effect at the time of permitting or in effect at the time of permit modification for modified systems).
Temporary Holding Pond	15	Temporary agricultural activities (as described in Chapter 40E-400, FAC.) with a properly constructed and permitted temporary holding pond.
Overland Sheet Flow Over Entire Property	15	No drainage improvements made to property so that property drains through overland sheet flow, or drainage improvements such as ditches have been removed to restore overland sheet flow drainage to the property.
No Point Discharge of Surface Water	15	Voluntarily disabling of drainage or implementation of other permanent means to prevent point discharge.
Tailwater Recovery System	10	A planned irrigation system in which facilities have been installed and the system is operated to collect, store, and transport irrigation tailwater and/or rainfall runoff that would have been discharged offsite without the system.
Precision Irrigation Scheduling	10	Combination of soil-moisture measuring equipment, specialized irrigation decision tools (e.g. computer software), and/or remote sensing tools to ascertain real-time crop needs to maximize irrigation system performance and to develop precise irrigation scheduling (time, location and amount).

*Surface water reservoir certification refers to a construction completion certification by a Florida licensed Professional Engineer as required in Chapter 40E-4, F.A.C., using Form 0881A for projects permitted after October 3, 1995, and Form 0881B for projects permitted prior to October 3, 1995, or the current certification requirements of Chapter 40E-4, F.A.C. (except where not required by existing permits).

BMP	PTS	DESCRIPTION
PARTICULATE MATTER AND SEDIMENT CONTROLS		MINIMIZES THE MOVEMENT OF P, IN PARTICULATE MATTER AND SEDIMENTS, OFF-SITE BY CONTROLLING THE AMOUNT OF ERODED SOIL AND PLANT MATTER IN DISCHARGE
Any 2 Any 4 Any 6 Any 8	2 ½ 5 10 15	• erosion control by leveling fields • reduce soil erosion using grassed swales and field ditch connections to laterals • minimize sediment transport with slow velocity in main canal near discharge structure • minimize sediment transport into canals by constructing ditch bank berms • minimize sediment build-up through a canal cleaning program • reduce sediments transported offsite by using field ditch drainage sumps • minimize sediment transport with slow field ditch drainage near pumps/structure • reduce sediments transported offsite by maintaining a sediment sump/trap upstream of drainage structure • reduce sediment transport through the use of grassed waterways • reduce sediment transport through the use of filter strips or riparian buffers adjacent to waterways. No P is applied to these areas. • reduce sediments transported offsite by raising culvert bottoms above all ditch bottoms to minimize sediment transport • reduce sediments transported offsite by stabilizing soil through infrastructure improvements at canal/ditch intersections (e.g. flexible plastic pipe, polymer treatment) • maintain sustainable forage growth on pasture to reduce soil erosion/range seedings • reduce soil erosion with constructed ditch bank stabilization • reduce soil erosion with cover crops (not fertilized) • maintain vegetative cover in upland areas to reduce soil erosion • reduce soil erosion with vegetation on ditch banks • minimize P from plants by aquatic weed control (P source) at main discharge locations • reduce debris and aquatic plants (P source) leaving the site by using barriers at discharge locations

BMP	PTS	DESCRIPTION
PARTICULATE MATTER AND SEDIMENT CONTROLS FOR PASTURE MANAGEMENT		MINIMIZES NUTRIENTS IN DISCHARGES THROUGH ON SITE OPERATION AND MANAGEMENT PRACTICES
	2 ½	• restricted placement of stored feed and feeders to reduce "hot spots" near drainage ditches
	2 ½	• restricted placement of cowpens to reduce "hot spots" near drainage ditches
	2 ½	• restricted placement of water to reduce "hot spots" near drainage ditches
	2 ½	• provide shade structures to prevent cattle in waterways
	5	• low cattle density (1 head/2 acres, non-irrigated pasture)
	10	• restrict cattle from waterways through fencing of canals in a manner that protects water quality

2.0 BMP PLAN ELEMENTS AND SITE VERIFICATION GUIDELINES

2.1 GENERAL

2.1.1 Education - Employee Training

The singularly most important part of a BMP plan is the communication, education, and training of employees who will be responsible for its continual implementation on a daily basis.

In the event that obvious and excessive impacts are visibly detected during periodic site visits conducted by the District, a more comprehensive site-specific sampling plan that would depend on the magnitude of the impact should be developed under the direction of the District and applicable regulatory agencies. Many BMPs are good common sense practices which ultimately can produce a cost savings to the site operations, as well as, proactively preventing adverse water quality impacts. An integral part of the employee training should include an overview of the reasons for implementing BMPs as described earlier.

Implementation requirements include:

- Proper training of field operators responsible for handling, loading, and operating fertilizer and chemical application machinery and proper maintenance of field equipment can minimize the potential for misapplication of agriculture related chemicals.
- Training sessions can be formal or informal.
  - Once per year group meetings should be conducted to cover all the BMP topics: overall good housekeeping, water management, fertilizer (nutrient) controls, chemical handing and application, fuel, and equipment maintenance.
  - Frequent (weekly or bi-weekly) reminder sessions keep a more continual message with staff. Frequent meetings can be informal "start-of-day" 15-minute reminders with a different reminder topic referenced each session.
- The transfer of the information received during the required continuing education (such as spray applicator licensing) to the individual chemical application staff is essential.
- A standardized checklist of discussion points could be developed and utilized to ensure all staff are aware of the importance of proper handling and application of fertilizers and chemicals.
- Special efforts should be taken to ensure that non-English speaking field personnel understand proper handling, loading, and operating techniques.
- Record keeping of employee BMP training/communications can include maintaining an Employee Training Checklist such as example provided.

2.1.2 Good Housekeeping

Property infrastructure should be kept in an overall good and repaired condition. Any solid waste, trash and/or discarded equipment should be stored in appropriate areas pending offsite disposal. Equipment and facilities should be kept in a relatively neat and orderly fashion. Fence lines, gates, and signage should be kept in good and repaired condition.

Implementation requirements include:

- BMP implementation is verified by visual observations.

2.2 WATER MANAGEMENT

2.2.1 Minimize Property Over Drainage and Maximize Irrigation Efficiency

Potential movement of water quality constituents originating from fertilizers and agrochemicals is substantially related to irrigation and drainage water management. Irrigation mostly affects the movement of water soluble agrochemicals while drainage mostly affects the movement of chemicals absorbed on soil particles. The primary management objective is to minimize the over drainage of the property by the active control of the site water table.

Implementation requirements include:

- Site verification will include meetings with operation managers to understand property water management approach and visual observation of structures and tools used to assist with water management decisions. Observations will include:
  - Real-time weather monitoring to proactive manage or limit drainage and/or irrigation events.
  - Water management achieved through water control structures such as designed culvert sizes and openings or culverts with flashboard risers.
  - For off-site discharge, on/off control elevations shall be established to initiate and stop draining or pumping. USSC currently has on/off controls on structures that discharge into offsite canals.
  - Partition property into hydrologic blocks to allow for internal water management (as opposed to one location to downstream point) whenever possible.
  - Installed water level indicators (e.g., float wells, staff gauges) can provide a visual indicator of actual water table levels. U.S. Sugar has a water table monitoring system that is in compliance.
  - Daily operation and maintenance must be properly recorded on field logs ensuring that on/off control elevations are met for pumps discharging off site and to surface water impoundments if these elevations are established by the surface water or environmental resource permits. Field log data shall include water table elevations at pump start and stop times, and pump rpms. Daily rainfall data shall be collected at representative locations within the farm to ensure that the on/off control elevations are current with the runoff detention requirements established by the permit.
  - Site verification will include meetings with Tenant/Lessee to review property water management approach, records, and field observation of structures and tools used to assist with water management decisions.

2.3 NUTRIENT MANAGEMENT (FERTILIZING)

At a minimum, the nutrient management BMPs in the District-approved plan shall include spill prevention, soil testing, and fertilizer application control specific to phosphorus and nitrogen.

Phosphorus fertilizer shall be applied at the root zone. Phosphorus application later in the growing season not applied at the root zone will require justification.

2.3.1 Nutrient Application Optimization

Fertilizers can be a significant source of adverse downstream water quality impacts contributing to algal blooms and stimulate growth of noxious plants in receiving water bodies. A comprehensive approach to optimize the amount of nutrients needed for proper vegetation health and productivity while at the same time having a proactive consciousness to minimize the risk to inadvertent potential off-site transport of nutrients is essential. Listed below are the various nutrient application BMP optimization efforts that can be identified in the site-specific BMP Plan:

- Maintain soil pH in optimum range
- Utilize Organic material soil amendments that have water quality benefits
- Appropriate use of other nutrient sources (i.e. non-commercially produced sludge, chicken manure, mill mud, wood chips, bagasse, molasses, etc) and formulations to prevent increased phosphorous and nitrogen loads in discharges off site
- Split fertilizer applications

Implementation requirements include:

- Site verification will include discussion with operation managers to understand the agricultural operation nutrient application optimization approach.
- Records must be available and reviewed to reinforce the implementation tools used to assist with nutrient management decisions. Records shall identify:
  - Areas tested
  - Testing methodology (soil)
  - Test results
  - Application recommendations
  - Application methods (fertigation, soil broadcast, topical spray, aerial, etc.)
  - Actual mixture/application rate applied
- Where actual fertilizer formula or quantity varies from soil test recommendations, notation shall be made to explain the logic for the variations.

All nutrient sampling conducted to insure compliance with the Nutrient Management Plan will be conducted by USSC.

Select soil and groundwater samples will be collected and analyzed for phosphorous and/or total nitrogen. The total nitrogen data will monitored over a 2 to 3 year period and be used to develop a baseline and determine what the background concentrations of total nitrogen are for the USSC properties. Based on the background levels as determined by this sampling, if total nitrogen levels increase over the establish background levels, then USSC and the District will review the application of nitrogen based nutrients.

2.3.2 Nutrient Handling and Placement

Fertilizers can be a significant source of adverse downstream water quality impacts contributing to algal blooms and stimulate growth of noxious plants in receiving water bodies. Proper storage of fertilizers is essential to prevent inadvertent transport of these materials to off-site waterways. Formal practices and protocols shall be established as to the handling and placement of fertilizer, storage and disposal of fertilizer containers, and fertilizer transfer on-site. Fertilizer spills shall be cleaned-up immediately. Listed below are the nutrient handling and placement BMPs for the USSC properties.

- Phosphorus fertilizer shall be applied at the root zone. Phosphorus application not applied at the root zone will require justification.
- Other fertilizers are applied by fertigation, banded, broadcast, topical spray, aerial, etc.
- Nutrients are to be applied only when necessary
- Proper Fertilizer storage (see below)
- Equipment calibration and maintenance must be timely and documented
- Appropriate Fertilizer loading sites (see below)
- Apply materials to target areas without overlapping application of fertilizer
- Avoid high leaching-potential situations
- Promptly recover spilled fertilizer
- Use backflow prevention devices
- Alternate loading operation sites

Implementation requirements include:

- Site verification will include discussion with operation managers to understand the agricultural operation nutrient handling and placement strategies. In addition, site inspections will be made to observe the following items:
  - Always store fertilizer in an area that is protected from rainfall and away from nearby ground and surface water and separately from solvents, fuels, and pesticides since many fertilizers are oxidants and can accelerate a fire.
  - Storage of dry bulk materials on a concrete or asphalt pad may be acceptable if the pad is adequately protected from rainfall and from water flowing across the pad.
  - Permanent liquid fertilizer tanks stored on impermeable surface curbed surfaces, and within secondary containment structures.
  - Bulk fertilizer transports and field loading located away from canal and ditches. Diligent care with plastic tarps and/or immediate clean-up (shovel) of dry material has been

shown to be effective.

- Random locations of field load fertilizer operations on site to prevent a buildup of nutrients in one location.
- Clean up spilled material immediately.
- Collected material may be applied as fertilizer.
- Collect dry material by shovel, vacuum, loader or wash down area to a containment basin specially designed to permit recovery and application of the wash water to the crop.
- Discharge of cleanup wash water to ditches or canals is strictly prohibited.

2.4 EXOTIC VEGETATION CONTROL

2.4.1 Upland Exotic Vegetation Control

The intent of this BMP is to control and eradicate to the extent practical, and prevent the infestation of Category I and Category II exotic/invasive pest plants and to minimize impacts on water quality. In particular for water quality, chemical control of mature aquatic vegetation may result in large amounts of labile particulate phosphorus levels from farms. Timing and selection of methods for aquatic vegetation control shall prevent generation of particulate phosphorus due to inappropriate aquatic vegetation control methods and disposal. Glyphosate based herbicide Rodeo may be spot applied on the aquatic vegetation, followed by removal of the dead vegetation. Excessive amounts of Rodeo application are not allowed.

Multiple control methods may employed to implement this BMP including:

- Physical control
- Biological control
- Chemical control

Implementation requirements include:

- Site verification will include discussion with operation managers to understand the agricultural operation upland exotic vegetation management approach.
- Site manager will maintain a simple map showing the general areas where exotic/invasive vegetation eradication activities are conducted on an annual basis.
- Visual observations will be conducted to verify exotic/invasive vegetation is being reasonably controlled.

2.4.2 Aquatic Exotic Vegetation Control

The intent of this BMP is to control and eradicate to the extent practicable, and prevent the infestation of Class I and Class II prohibited aquatic plants. Multiple control methods may be employed to implement this BMP including:

- Physical control
- Biological control
- Chemical control

Implementation requirements include:

- Site verification will include discussion with operation managers to understand the agricultural operation upland aquatic exotic vegetation management approach.
- Site manager will maintain a simple map showing the general areas where exotic/invasive aquatic vegetation eradication activities are conducted on an as need basis.
- Visual observations will be conducted to verify no or a minimal amount of prohibited aquatic plants are present.

2.5 EROSION/SEDIMENT CONTROL

It is estimated that approximately 50-75% of the nutrient and chemicals discharged in stormwater runoff are associated with particulates (muck particles, dirt, dust, plant vegetation, etc.). The minimization and prevention of erosion and particulate/muck/dirt transport from blocks, fields, ditches, and canals to drainage pump stations or discharge culverts can have a substantial positive effect in preventing the off-site transport of nutrients and chemicals that can cause adverse downstream water quality problems.

Implementation requirements include:

- Records will be kept identifying description and location of the erosion/sediment control BMPs and all the maintenance and operations conducted through the year to sustain the BMP's effectiveness.

A minimum of four (4) erosion/sediment control BMPs from the equivalent points reference table above will be implemented and maintained consistently throughout the site at all times.

2.6 PESTICIDE AND HERBICIDE MANAGEMENT

2.6.1 Allowable Agrochemical List and No Application Period

The presence of agrochemicals (particularly persistent pesticides) should be minimized so as to not cause adverse impacts to anticipated flora and fauna. As current landowner, the District must ensure that all application of agrochemicals on-site is conducted in accordance with all applicable laws and regulations.

The following **Chemical Application Restrictions** matrix must be followed. This matrix is based on the U.S. Fish and Wildlife Service's "Derivation of No Application Periods". A copy of the document is included in **Appendix A**. The agrochemical list should be reviewed annually for the effectiveness of the applied chemical, changes in regulations regarding specific pesticides, and changes in the management and use of the pesticides must be followed. The experimental use of pesticides and herbicides is prohibited. All agrochemicals must be applied in strict accordance to label instructions and restrictions.

Additionally, USSC will provide the District a quarterly report of agrochemicals in use on the sugar cane production parcels.

2.6.1.1 CHEMICAL APPLICATION RESTRICTIONS

The following are lists of chemicals provided by USSC that are used for sugar cane cultivation and vegetable farming. The following agrochemicals have the potential to be used subject to the restrictions noted below. *Chemicals not specifically listed below may be evaluated on a case by case basis and added to the appropriate category below. For chemicals with no analytical test method and identified as a potential environmental risk, the chemical manufacturer will be contacted to obtain the chemical standard. The District will then contract a Florida based laboratory to develop an analytical test method for the chemicals.

SUGAR CANE

A. May be used at any time but only according to label restrictions:

1,2-propylene glycol	Polyacrylamide	Xylene
2,4-Dichlorophenoxyacetic Acid (*Unison*)	Hydroxy carboxylic acid and/or Polyacrylic acid (*Quest*)	Water and nonionic emulsifiers (*Foambuster*)
Ethylbenzene	Polyalkyleneoxide (*Kinetic*)	Plant nutrients (*Tracite*)
Glyphosate (*Roundup, Touchdown*)	Nonionic Colloidal water (*Strike Zone*)	
Magnesium Sulfate (*Dyna*)	Quartz	
Paraffin based mineral oil and/or XXX (*Crop Oil*)	Sodium salt (*Asulam*)	
Petroleum solvent	Urea (*Urea*)	
Phosphatidycholine (*LI700*)	Surfactant	

B. Must be discontinued at least 3 months prior to flooding:

2-Butoxyethanol (*Dynamic*)	Methanol (*Asulox*)	Mepiquat (*Reign*)
Azoxystrobin (*Azoxystrobin*)	Mesotrione (Callisto)	

C. Must be discontinued at least 6 months prior to flooding:

Ethoprop (*Mocap*)	Pyraclostrobin and/or Naphthalene (*Headline*)	Pyrimethanil (*Vision*)
Halosulfuron-methyl (*Sempra, Yukon*)	Phorate (*Thimet*)	Propylene Glycol and/or Carbofuran (*Furadan*)
Propylene Glycol and/or Chlorothalonil (*Quadris*)	Pendimethalin	Diphacinone (*Ramikk Brown*)

D. Must be discontinued at least 1 year prior to flooding:

Atrazine (*Atrazine*)	Ethylene dichloride (*Prowl*)	Esfenvalerate (*Asana*)
Clomazone (*Command*)	Metconazole (*Caramba*)	

E. Must be discontinued at least 2 years prior to flooding:

Ametryn (*Evik*)	Trifloxysulfuron-sodium (*Envoke*)	Cyproconazole (*Cyproconazole*)

Fluquinconazole
(*Jockey*)

F. Not allowed:
USSC does not apply any chemicals to the sugar cane that are not allowed.

****VEGETABLES – Beans, Watermelon, and Sweet Corn**

A. May be used at any time but only according to label restrictions:

Azadirachtin (*Aza-Direct & Azatin XL*)

Bacillus thuringiensis subspecies (*Agree WG, Biobit HP, Crymax, Deliver, DiPel DF, Javelin WG, Lepinox, and Xentari DF*)

Carfentrazone (*Aim*)
Copper hydroxide (*Mankocide 61DF, Copper 70W, Champ DP, and Basic Copper 53*)
EPTC (*Eptam*)

Glyphosate (*Roundup, Durango, Touchdown, and Glyphomax*)

Sulfur (*Kumulus DF, Micro Sulf, Micronized Gold, Microthiol Disperss, Sulfur 90W, Thiolux Jet, and Wettable Sulfur*)
Neem Oil (*Trilogy*)
Hydrogen dioxide (*Oxidate*)

Potassium phosphite (*Fosphite, Prophyt, and Topaz*)

Bacillus subtillus strain QST 713 (*Serenade ASO, Serenade Max, Sonata, and Rhapsody*)
Beauveria bassiana (*BotaniGard 22WP*)

Pelargonic Acid (*Scythe*)

B. Must be discontinued at least 3 months prior to flooding:

Buprofezin (*Courier 40SC*)

Dimethoate (*Dimethoate 4EC*)

Oxydemeton-methyl (*MSR Spray Concentrate*)

Pyrethrin (*Pyrellin EC*)
Pyriproxyfen (*Esteem Ant Bait and Knack IGR*)

Spinosad (*Entrust and SpinTor 2SC*)
Trifloxystrobin (*Flint 50WP*)
Azoxystrobin (*Amistar 80DF, Heritage, and Quadris*)
S-Methoprene (*Extinguish*)

C. Must be discontinued at least 6 months prior to flooding:

Bentazon (*Basagran*)

Carbaryl (*Sevin 80S*)

Cyfluthrin (*Baythroid 2*)
Cyhalothrin (*Proaxis Insecticide*)

Dicofol (*Kelthane 50WSP*)

Ethoprop (*Mocap 15G*)

Halosulfuron-methyl (*Sandea*)
Imidacloprid (*Admire 2F*)

Methyl parathion (Penncap-M)
Permethrin (*Ambush 25W and Pounce 25W*)
Phorate (*Thimet 20G*)
Pendimethalin (*Prowl*)

Diazinon (*Diazinon 4E*)	Methomyl (*Lannate LV and Lannate SP*)	Chlorothalonil (*Applause 720, Bravo, Choloronil 720, Echo, Equus, and Ridomil Gold Bravo*)
Pyraclostrobin (*Cabrio 20EG*)		

D. Must be discontinued at least 1 year prior to flooding:

Dichloropropene (*Telone II*)	Esfenvalerate (*Asana XL*)	S-Metolachlor (*Dual Magnum*)
Endosulfan (*Endosulfan 3EC*)	Myclobutanil (*Nova 40W*)	

E. Must be discontinued at least 2 years prior to flooding:

Bifenthrin (*Capture 2EC*)	Mefenoxam (*Ridomil Gold 4EC, Ridomil Gold SL, and Ultra Flourish*)	Boscalid (*Pristine 38WG*)
Cyromazine (*Trigard*)	Methoxyfenozide (*Intrepid 2F*)	

F. Not allowed:

Paraquat (*Gramoxone Inteon*)

G. Restricted Pending Further Evaluation (District is currently evaluating the long term affects of the chemical application):

Thiophanate-methyl (*Topsin M WSB and Thiophanate-methyl*)	Fludioxonil (*Maxim 4FS*)

* Any pesticide, regardless of the above categories, that is shown to be present in the soil, at or above the site specific cleanup target levels, may require additional restrictions, including reductions in use or the complete elimination of its use. These situations will be evaluated on a case-by-case basis.

2.6.2 Copper Compounds

Copper is an essential element required for the successful and economical growing of sugar cane. It is typically applied to the soil surface as a granular additive to fertilizer. The Phase II ESA identified 104, 40-acre grids, or 4,160-acres with elevated copper levels in the cultivated fields above the Service provisional Snail Kite threshold level of 85 mg/kg. Based on the Phase II findings on elevated copper concentrations, no additional copper should be applied on the 4,160-acres. In the event that copper is not bio-available, as verified by additional soil testing, USSC will work with the District to develop a copper nutrient application that will benefit the production of sugar cane and limit the residual copper levels in the soils as much as practical. **Table 1** displays the field identification numbers for copper concentrations above 85 mg/kg.

URS reviewed the current rates of application and amounts of copper based nutrients applied on the USSC property. Utilizing this information, a mass balance equation was developed in order to determine if additional acreage would be impacted by copper based on the current application activities. URS

determined that copper could potentially increase in the soils, per application, at a rate of 2.08 mg/kg per acre. Based on this application rate, and the fact that the property is leased through 2016, twelve, 40-acre grids have the potential to accumulate copper above the Service's interim value for copper of 85 mg/kg during the lease agreement.

During this interim use period, soil samples should be collected for previous sampled areas within the cultivated fields to confirm that residual copper concentrations are not accumulating in the soil. In the event that elevated copper concentrations are detected, then the tenant must implement measures to prevent further increases. A subsequent determination of a 20 percent or greater increase, based on the methodology in **Section 3.0**, below, will constitute a breach of the tenant's lease.

If the sampling conducted in the subsequent year again indicates elevated copper above the 85 mg/kg the District and USSC will work together to develop a copper application that will limit the residual copper levels in the soils as much as practical.

2.6.3 Pesticide and Herbicide Management

Florida pesticide law requires certified applicators to keep records of all restricted use pesticides (RUP). The federal worker protection standard (WPS) requires employers to inform employees of all pesticides applied.

- Pesticide record keeping
- Read and understand label
- Pesticide storage

Implementation requirements include:

- Site verification will include discussion with operation managers to understand the agricultural operation pesticide management approach. In addition, example records should be available and reviewed to reinforce the implementation tools used to assist with pesticide management decisions.
- Required records must be made available upon request to FDACS, USDA authorized representatives, and licensed health care professionals.
- Proper pesticide storage is important for (a) personnel safety and (b) as a preventative spill measure. Visual observations will ensure the following procedures are in place:
  - Storage structures should keep pesticides secure (locked) and isolated from the surrounding environment.
  - Pesticides need to be stored in their original containers.
  - Pesticides should not be stored near burning material, hot work (welding, grinding), or in shop area.
  - No smoking is allowed in pesticide storage areas.
  - Store personal protective equipment where it is easily accessible in the event of an emergency, but not in the pesticide storage area.

- Maintain a current written inventory and the Material Safety Data Sheets (MSDS) for the chemicals used in the operation. Do not store this information in the pesticide storage room itself.
- Large chemical quantities should not be stored for long periods of time. Adopt the "first in – first out" principle, using the oldest products first to ensure that the product shelf life does not expire.
- Containers need to be arranged so that labels are clearly visible; make sure labels are legible; refasten loose labels.
- Dry bags should be raised on plastic pallets to ensure that they do not get wet. Do not store liquid material above dry materials.
- Flammable pesticides should be stored separately from non-flammable pesticides.
- Segregated herbicides, insecticides, and fungicides to prevent cross-contamination and minimize potential for misapplication.
- Shelving should be made of plastic or reinforced metal. Metal shelving painted (unless stainless steel) to avoid corrosion. No wood shelving because it may absorb spilled pesticide materials.

2.6.4 Pesticide and Herbicide Application Optimization

Management of the types and amounts of pesticides applied in or on the soil or on plant foliage is important so the exact problem identified is being addressed and minimize the impacts to surface and ground water. Even pesticides designed for rapid breakdown in the environment can persist for years if present in high concentrations. Worst-case results can be contamination of drinking water; fish kills and other impacts to nontarget organisms; and administrative fines and legal remedies. The most obvious method to reduce the risk from pesticides is to use them only when necessary.

- Integrated pest management
- Application timing
- Customized applications
- Maintain soil pH in optimum range
- Pesticide selection

Implementation requirements include:

- Integrated Pest Management (IPM) is a philosophy of management pests that aims to reduce farm expenses, conserve energy, and protect the environment. IPM is a broad, interdisciplinary approach using a variety of methods to systematically control pests which adversely affect people and agriculture. Basic steps include:

  1) Identify key pests/vegetation and beneficial organisms and the factors affecting their populations.

2) Select preventative cultural practices to minimize pests/vegetation and enhance biological controls (e.g. soil prep, crop rotation, resistant varieties, modified irrigation dates, cover crops, augmenting beneficials, etc.).

3) Use trained 'scouts' to monitor pest/vegetation populations to determine if or when an emergency control tactic might be needed.

4) Predict economic losses and risks so that the cost of various treatments can be compared to the potential losses to be incurred.

5) Decide the best course and carry out the corrective actions.

6) Continue to monitor pest/vegetation populations to evaluate results of the decision and the effectiveness of correction actions. Use this information when making similar decisions in the future.

USSC currently has an IPM program in place and the policy has been implemented.

- Always follow pesticide/herbicide label instructions. However, pesticide and herbicide recommendations can change frequently. Registrations may be canceled or added at any time. Recommended rates or products that were valid at the start of the growing season may change. For pesticides/herbicides that are not generally used on the property, check with the local Extension agent for the most recent recommendations, or access the computer based Florida Agriculture Information Retrieval System (FAIRS).
- Base pesticide/herbicide selection on characteristics such as soil, geology, depth to water table, proximity to surface water, topography and climate, so that the potential for pollution of surface water and ground water is minimized.
- Consider the effect of a pesticide/herbicide application on any beneficial organism that may be present.

Federal and State Chemical Hazard Information contacts and telephone numbers are given in **Appendix C**.

2.6.5 Pesticide and Herbicide Handling and Placement

Routine maintenance, good repair, and calibration of pesticide application equipment will minimize the unintended over (or under) application of chemicals. Correct measurement will keep the operation in compliance with the label, reduce risks to applicators, operation staff, and the environment, and may save money. Locate mixing and loading operations well away from groundwater wells and surface water ditches, laterals and canals where runoff may carry inadvertently transport spilled chemicals. Proper cleaning and disposal of "empty" pesticide containers is just as important as proper application of the chemicals. Listed below are the various required pesticide handling and placement BMPs.

- Reduce spray drift
- Equipment calibration & maintenance
- Pesticide spill management

- Pesticide application equipment wash water
- Prevent backflow to water sources
- Mixing and loading activity locations
- Pesticide container management
- Excess pesticide mixture
- Excess formulation (raw product)

Implementation requirements include:

- Site verification will include discussion with operation managers to understand the agricultural operation pesticide handling and placement approach. In addition site inspections will be made to observe the following items:

Permanent Locations

- A permanently located mixing and loading facility should be designed to provide a place where high-potential spill activities can be performed over an impermeable surface (such as sealed concrete) for easy cleaning and permits the recovery of spilled materials.
- USSC currently does not have a permanent mixing and loading facility. Should USSC elect to construct a permanent mixing and loading facility, the facility must be in compliance with IFAS standards.
- The mix/load facility should be located close to the chemical storage building.
- Permanent areas should have a roof with a substantial overhang on all sides to protect against windblown rainfall.

Temporary Locations

- Pesticide loading activities should be conducted at random locations in the field lessens the chance of buildup of spilled material at any one place. This will reduce the chance of adversely affecting the natural organisms which biologically degrade pesticides.

Nurse Tanks

- Use of clean water only in nurse tanks transported to the field to fill the sprayer is encouraged. Never introduce pesticides into a nurse tank.
- Inject pesticides into the transfer line or add them to the spray rig during filling.
- Pesticides may be introduced by conventional pouring, or pumped by a closed system, depending on label requirements and container type.
- Always use a check valve to prevent backflow of pesticides into the clean mix water.

Container Disposal

- No bags, boxes, and Group I pesticide containers may be burned on-site.

- Keep the rinsed containers in a clean area, out of the weather, or in large plastic bags for disposal or recycling to protect the containers from collecting rainwater.

URS has reviewed the USSC portable mix-load operations and the system is in compliance with IFAS.

2.7 COPPER

Copper has several necessary and beneficial uses within an active agricultural operation including use as fungicides and soil nutrients, and as a canal and ditch aquatic vegetation management tool. Recently, the topic of residual levels of copper in soils of tracts which are intended for conversion to water reservoir areas has had renewed discussion. The District has reported that some analyses and data extrapolations suggest that elevated copper levels have the potential to move through the aquatic food chain and bio-accumulate in the tissue of apple snails. The apple snail is the primary diet of the Snail Kite. It has been reported to the District that it is theorized that elevated copper levels can potentially result in underweight Snail Kite chicks. Since the Snail Kite is listed as an Endangered Species, and the potential for this bird to forage in the future reservoirs, the minimization of the risk for elevated copper levels is desired by the District. Extreme diligence is needed to minimize the amount of copper applied.

Implementation requirements include:

- Site verification will include discussion with operation managers to understand the agricultural operation copper application (if any) optimization approach.
- Records should be available and reviewed to reinforce the implementation tools used to assist with copper management decisions. Records should identify:
  - Locations (e.g. cultivated field, ditch and canal) where copper was applied
  - Time of application
  - Application mixture/application rate applied

2.8 PETROLEUM AND HAZARDOUS WASTE MANAGEMENT

2.8.1 Gasoline and Diesel Fuel Storage and Containment

The first line of management is to minimize the possibility of inadvertent petroleum product discharge and the need for clean-up and disposal. Stationary fuel storage tanks should be in compliance with FDEP storage tank regulations (Chapter 62-761, FAC for underground storage tanks (USTs) and Chapter 62-762, FAC for aboveground storage tanks (ASTs)). In the event of a discharge or spill, emergency response and chemical hazard information and telephone numbers are given in **Appendix C**.

Implementation requirements include:

- Site verification will include discussion with operation managers to understand the agricultural operation petroleum storage and containment management approach. In addition site inspections will be made to observe the following items:

Site Equipment

- Placement of permanent fuel pumps on concrete or asphalt surfaces away from groundwater wells and surface water ditches, laterals and canals where runoff may carry inadvertently

transport spilled product.

- ASTs with volumes of 550 gallons or larger must be registered and located within secondary containment systems unless of double-wall construction.
- Visual inspections should be conducted on a least a monthly basis of the storage tanks and hoses to ensure the system is free from leakage from tank seams, connections, and fittings.

Fuel delivery

- Require delivery driver to report to facility manager upon arrival prior to loading or unloading.
- Agricultural operation employee should verify available tank capacity prior to product transfer.
- Agricultural operation employee should remain onsite during delivery to monitor product transfer.
- Clean-up equipment and/or materials should be located nearby if needed for immediate spill containment and clean up (boom, granular absorbent, etc.).

2.8.2 Equipment Cleaning and Maintenance

(Does not include pesticide application equipment) The same level of preventive measures should be taken to minimize adverse sediment/water quality impacts from the cleaning of equipment as with fertilizer and agrochemical handling and application. Other than preventative maintenance and emergency repair of machinery and equipment conducted on site, maintenance should be conducted in a centralized area a safe distance from the closest well-head or surface water ditch, lateral, and canal. It is recommended that equipment maintenance be limited to minor or emergency repairs. Activities such as engine or mechanical repair, which generate a waste or waste by-product, are not recommended to be conducted in the fields but at designated maintenance areas.

Implementation requirements include:

- Site verification will include discussion with operation managers to understand the agricultural operation hazardous waste management approach. In addition, site inspections will be made to observe the following items:

General Equipment Maintenance

- Where possible, it is recommended to use compressed air to remove clippings and dust from machinery. This is less harmful to the equipment's hydraulic seals, eliminates wash water, and produces dry material that is easy to handle.
- For regular field equipment wash down (other than pesticide application equipment, and with not degreaser or solvents), allow wash water to flow to a grassed retention area, swale, or sod fields as irrigation water. Do not allow wash water to flow directly to surface water ditch, lateral, or canal.
- Minimize the use of detergents and use only biodegradable, non-phosphate type. The amount

of water used to clean equipment can be minimized by using spray nozzles that generate high pressure streams and low volumes.

- If equipment is to be intensively washed, conduct over a concrete or asphalt pad that allows the water to be collected. Wash water can contain soaps, fertilizer residues, solids, and lubricating oil residues. Collected wash water can be handled through a recycling system, treatment system, off-site disposal at an industrial wastewater treatment facility, or use the wash water for field irrigation.

Solvents and Degreasers

- It is the intention that all major repairs and maintenance activities that would potentially require the use of solvents and degreasers be conducted on-site at designated maintenance areas. In the event that such activities occur on-site, the operator will follow the guidelines below:
  - Whenever practical, replace solvent baths with recirculating aqueous washing units.
  - Soap and water or other aqueous cleaners are often as effective as solvent-based cleaners.
  - Store solvents and degreasers in lockable metal cabinets in an area away from ignition sources (e.g. welding areas, grinders) and provide adequate ventilation.
  - Always wear the appropriate protective personal equipment, especially eye protection, when working with or handling solvents.
  - Solvent wash basins that drain into recovery drums can be provided by private firms contracted to pick-up and recycle or properly dispose of the drum content.
  - Never mix used oil and other liquid material with the used solvents.
- Records must be maintained of pick-up and quantities disposed.

Paint

- The use of power sprayers for painting equipment on-site requires the appropriate precautions to be taken not to impact soil or groundwater. The painting of equipment with solvent based paint by power sprayers is prohibited and must be conducted off-site.
- Touch-up and manual painting may be conducted on a limited basis.
- Care should be taken not to spill material onto soil or into surface water bodies.

Used Oil, Coolant, and Lead-Acid Batteries

- Collect used oil and oil filters in separate marked containers and recycle.
- Oil filters should be drained and taken to the same place as the used oil, or to a hazardous waste collection site.
- Coolant/Antifreeze must be recycled or disposed as a hazardous waste. Do not mix used oil with used coolant or sludge from solvents.
- Lead-acid storage batteries are classified as hazardous wastes unless they are recycled.

Store batteries on an impervious surface and preferably under cover until delivery to an authorized recycling facility.

All used oil, coolant, and lead-acid batteries are stored in containers in accordance with FDEP rules until being transported offsite for disposal by a licensed contractor.

3.0 SAMPLING AND COMPLIANCE PLAN (SUGARCANE AREAS)

3.1 VERIFICATION SAMPLING

Cultivated area sampling will be conducted by the District on an annual basis. Soil samples shall be collected from the cultivated area at randomly selected locations based on the grid pattern and numbering system used in the Phase I/II ESA. The BMP annual sampling event will randomly select a number of those grids sampled during the Phase I/II ESA. Based on the Phase I/II ESA findings and review of the chemicals list provided by USSC, the sampling activities by the District will involve grids, which are identified by USSC as being fallow. The grids generally comprise of 40-acres fields. Within each field, at equally spaced locations, eight (8) close-composite discrete samples from the top 6-inches of the soil will be collected and combined into a single composite sample. The composite samples will then be analyzed for a number of parameters of concern.

The number of grids to be sampled are determined according to the *a priori* statistical procedure recommended by the United States Environmental Protection Agency (EPA, 1989, Section 6). This procedure is based on commonly used, well-established statistical hypothesis testing processes, in which, collected data during each year is compared to the baseline dataset in order to detect the presence of any statistically significant difference (EPA, 2000). For determination of the sample size, EPA (1989) suggests a null hypothesis that is equivalent to the condition, under which the baseline and subsequent datasets display statistically significant differences. Conversely, the alternative hypothesis corresponds to a condition, under which the baseline and subsequent datasets are devoid of any statistically significant difference. Each year, upon collection of one round of post-baseline samples, the compiled baseline and subsequent datasets are statistically compared to assess whether further investigations are warranted. The components of the proposed statistical process are described in the following sections.

3.1.1 Determining Number of Baseline Grids

EPA (1989, Section 6.3.2) provides a quantifiable measure for determining an adequate sample size. The sample size is driven by three factors: (a) the chosen decision errors, (b) the variability of the potential contaminants of concern, and (c) the desired resolution, *i.e.*, the difference between the baseline and subsequent datasets that needs to be detected at the chosen confidence. The resulting equation is

$$n = \frac{(z_{1-\alpha} + z_{1-\beta})^2 s^2}{\Delta^2}$$

where,

n = number of grids to be sampled each year

α = the false positive rate, Type I error, or the significance (tolerable error for missing an actual difference between the baseline and subsequent datasets)

$1-\alpha$ = the confidence (probability of correctly identifying a significant change)

β = the false negative rate, or Type II error (tolerable error for incorrectly declaring a difference between the baseline and subsequent datasets)

$1-\beta$ = the test power (probability of correctly identifying the absence of no difference)

$z_{1-\alpha}$, $z_{1-\beta}$= the confidence and power normal deviates

s^2 = standard deviation of parameter of concern

Δ = The minimum difference between the mean concentrations of the baseline and subsequent datasets to be detected at the chosen confidence

Samples collected at the selected grids during the Phase I/II ESA conducted on the USSC property by PSI in August and September 2008 shall be used as the baseline for comparison to future sampling results. Among parameters of concern, arsenic, copper and selenium have been analyzed extensively during Phase I/II ESA. The reported concentrations of these analytes based on composite samples from 40-acre sugarcane fields are used in order to compute their corresponding mean and standard deviation, as listed in Table 2. This table also displays the number of samples based on the chosen decision errors. In these calculations, the desired minimum difference is set as 20% of the computed mean concentrations. Among the parameters of concern, currently available baseline copper data indicate the highest sample size, which is selected to ensure the conservative nature of the proposed BMP annual sampling plan. This results in 119 grids to be randomly selected for baseline and sampling purposes as part of the BMP efforts, as highlighted in Table 2.

3.1.2 Baseline/Subsequent Datasets Statistical Comparisons

Annual BMP sampling will be conducted, at field locations with the same GPS coordinates measured during the initial sampling and at a time mutually agreed upon by the parties so as to minimize damage to field crops, to ensure consistency with the original Phase I/II ESA results. Upon completion of each annual BMP sampling round, the analytic results of parameters of concern will be compared to those compiled in the baseline and previous BMP datasets. For this purpose, a series of comprehensive statistical two-sample tests will be conducted. Pursuant to DON (2002), as listed on Table 3, two difference hypotheses will be assessed, including:

(a) Area-wide differences between the baseline and subsequent datasets: This hypothesis corresponds to a condition, under which the baseline concentrations are consistently different from the subsequent concentrations. Consequently, the statistical tests will be conducted through comparison of mean (parametric) and median (non-parametric) concentrations.

(b) Localized differences between the baseline and subsequent datasets: This hypothesis corresponds to a condition, under which only the elevated baseline and subsequent concentrations are different. Consequently, the statistical tests will be conducted through comparison of higher concentrations or exceedance ratios in each dataset.

The procedural aspects for the selection and implementation of the cited tests in Table 3 are described in details in DON (2002, Chapter 4). Appropriate statistical comparisons, including parametric t-tests, non-parametric Wilcoxon Rank Sum test, and non-parametric Slippage tests, will be conducted annually. Depending on the statistical characteristics of the subsequent datasets, additional test may be performed. In the case of detection of a statistically significant increase at 5% significance, when the increase in mean or median concentrations is greater than 20 percent, among subsequent measured concentrations with respect to the baseline concentrations, additional investigations and actions, as set forth below, will be pursued.

The specific objectives of additional investigations are: (a) to determine whether the detected increase in post-baseline concentrations are real, and not numeric artifacts caused by the variability of individual

samples results, and (b) if real, to determine whether the detected increases in post-baseline concentrations are due to practices by the tenant. For this purpose, additional investigations will be initiated, including a review of laboratory QA/QC results and information provided by the tenant concerning its chemical use practices during the period of interest. If increase in mean concentrations is attributed to few outlier samples among post-baseline data, locations associated with these outliers will be re-sampled to ensure the validity of the original results. The cost of additional investigations shall be the responsibility of the party requesting it.

If the District determines that a detected increase in mean or median concentrations in excess of 20% is a numeric artifact caused by the variability of individual samples, or attributed to historic conditions, no further action with regards to the tenant's lease will be pursued. On the other hand, if the increase in mean or median concentrations in excess of 20% is deemed to have been caused by other factors, the District will notify the tenant in writing of its determination and its basis, and the tenant will be requested to implement those measures, if any, that the tenant considers appropriate to prevent further increases in concentrations, including but not limited to additional sampling or best management practices.

If a statistically significant increase in concentrations is detected during a subsequent consecutive year and determined by the District to not be a numeric artifact or caused by variability of individual samples, the tenant shall work cooperatively with the District to develop a more comprehensive BMP plan to reduce or eliminate further increases. The new BMP plan shall be approved by the District, implemented by the tenant, and incorporated into the lease and, in the case of a subtenant, its sublease. In the event a subsequent consecutive sampling event results in a third, consecutive statistically significant increase, the District, in consultation with the tenant, shall review the tenant's standard farming practices, which review should include an assessment of the practices in terms of potential risk to future aquatic ecosystems or human health. If it is determined that the increase in concentrations may cause significant risk to future ecosystems that may be constructed in the area or human health to workers or occupants, the tenant will implement changes to its standard practices prescribed by the District, after joint consultation with the tenant, to reduce the potential for such risk. Failure to implement this review within the prescribed schedule will be considered a default of the tenant's lease.

3.1.3 Summary of BMP Sample Plan

Table 4 lists BMP sample plan inside and outside of sugarcane cultivation areas, as well as the current list of parameters of concern. Given the fact that for a number of parameters of concern, there are currently no baseline dataset available, the sample size computations will be repeated after the first round of BMP periodic sampling, which may result in applicable modifications of this BMP plan to address elevated parameters of concern covering parts or the entire extent of the investigated areas. Future changes in subsequent rounds of BMP may include further division of the investigated areas into more homogenous subareas for the purposes of sampling and statistical comparisons. Such changes may require additional sampling to accommodate the delineated subareas. Furthermore, in the event that obvious and excessive impacts are visibly detected during periodic site visits conducted by the District, a more comprehensive site-specific sampling plan that would depend on the magnitude of the impact should be developed under the direction of the District and applicable regulatory agencies. A list of potential parameters to be analyzed for is given below.

EPA Method 8141 (organophosphorus pesticides)
EPA Method 8151 (chlorinated herbicides)
EPA Method 6010/7471 (copper)
FL-PRO Method (total residual petroleum hydrocarbons)
EPA Method 8100 (polynuclear aromatic hydrocarbons)
EPA Method 8020 (volatile organic hydrocarbons)
Metconazole and pyraclostrobin

TABLES

TABLE 1
U.S. SUGAR CORPORATION
SUGAR CANE COPPER CONCENTRATIONS ABOVE 85 mg/kg - FIELD IDENTIFICATION
Job No. 38617-027

Tract Number	Map	Block/Field #	Agricultural Product	Acres
SC-100-161	5	2319P	Sugar Cane	40
SC-100-162	5	2322EF	Sugar Cane	40
SC-100-042	8	3429DH	Sugar Cane	40
SC-100-044	10	3433AE	Sugar Cane	40
SC-100-060	15	3425MN	Sugar Cane	40
SC-100-079	15	3531D	Sugar Cane	40
SC-100-080	17	4504OP	Sugar Cane	40
	17	4515CD	Sugar Cane	40
	17	4515JN	Sugar Cane	40
	17	4515O	Sugar Cane	40
	17	4516GH	Sugar Cane	40
	17	4516IM	Sugar Cane	40
	17	4516KO	Sugar Cane	40
	17	4517KL	Sugar Cane	40
SC-100-140	17	4518CD	Sugar Cane	40
	17	4518KL	Sugar Cane	40
	19	4519CG	Sugar Cane	40
	19	4519DH	Sugar Cane	40
	19	4519LP	Sugar Cane	40
	19	4530AE	Sugar Cane	40
	19	4530BF	Sugar Cane	40
	19	4530CG	Sugar Cane	40
	19	4530DH	Sugar Cane	40
	19	4530IM	Sugar Cane	40
	19	4530JN	Sugar Cane	40
	19	4530KO	Sugar Cane	40
SC-100-084	19	4528KL	Sugar Cane	40
	19	4532OP	Sugar Cane	40
SC-100-095	21	4619JN	Sugar Cane	40
	21	4619KO	Sugar Cane	40
	21	4619LP	Sugar Cane	40
	21	4621BF	Sugar Cane	40
	21	4621IM	Sugar Cane	40
SC-100-096	21	4525CG	Sugar Cane	40
	21	4525DH	Sugar Cane	40
	21	4629IM	Sugar Cane	40
	21	4629JN	Sugar Cane	40
	21	4629KO	Sugar Cane	40
	21	4629LP	Sugar Cane	40
	21	4630DH	Sugar Cane	40
	21	4631CG	Sugar Cane	40
	21	4631DH	Sugar Cane	40
	21	4631KO	Sugar Cane	40
	21	4631LP	Sugar Cane	40
	21	4632AE	Sugar Cane	40
	21	4632BF	Sugar Cane	40
	21	4632CG	Sugar Cane	40
	21	4632DH	Sugar Cane	40

Tract Number	Map	Block/Field #	Agricultural Product	Acres
SC-100-099	21	4628AE	Sugar Cane	40
	21	4628IM	Sugar Cane	40
	21	4628KO	Sugar Cane	40
	21	4628LP	Sugar Cane	40
	21	4633AE	Sugar Cane	40
	21	4633CG	Sugar Cane	40
	21	4633DH	Sugar Cane	40
	21	4633IM	Sugar Cane	40
	21	4633JN	Sugar Cane	40
	21	4633KO	Sugar Cane	40
	21	4633LP	Sugar Cane	40
	22	4634BF	Sugar Cane	40
	22	4634IM	Sugar Cane	40
	22	4634JN	Sugar Cane	40
SC -100-097	22	4622IJ	Sugar Cane	40
SC-100-002	23	5525CD	Sugar Cane	40
	23	5525KL	Sugar Cane	40
	23	5526AB	Sugar Cane	40
	23	5526EF	Sugar Cane	40
	23	5535IJ	Sugar Cane	40
	27	3734CG	Sugar Cane	40
SC-100-114	27	3734CG	Sugar Cane	40
SC -100-115	27	3736AE	Sugar Cane	40
	27	3736BF	Sugar Cane	40
	27	3736DH	Sugar Cane	40
	27	3736KO	Sugar Cane	40
	27	3736LP	Sugar Cane	40
	27	4702CG	Sugar Cane	40
	27	4712DH	Sugar Cane	40
SC-100-138	27	3836GH	Sugar Cane	40
	27	3836KL	Sugar Cane	40
SC-100-113	28	3819EF	Sugar Cane	40
SC -100-118	30	2819KL	Sugar Cane	40
	30	2819OP	Sugar Cane	40
	30	2820AF	Sugar Cane	40
	30	2820IJ	Sugar Cane	40
	30	2820KL	Sugar Cane	40
	30	2820MN	Sugar Cane	40
	30	2820OP	Sugar Cane	40
SC-100-131	32	1830IM	Sugar Cane	40
	32	1830JN	Sugar Cane	40
	32	2702D	Sugar Cane	40
SC-100-132	33	1712KL	Sugar Cane	40
	33	1712MN	Sugar Cane	40
	33	1712OP	Sugar Cane	40
	33	1713AE	Sugar Cane	40
	33	1713BF	Sugar Cane	40
	33	1713CG	Sugar Cane	40
	33	1816MN	Sugar Cane	40
SC-100-134	36	2836KO	Sugar Cane	40
	36	2931AE	Sugar Cane	40
	36	2931IM	Sugar Cane	40
	36	2931JN	Sugar Cane	40
	36	3801CG	Sugar Cane	40
	36	3906AE	Sugar Cane	40
	36	3906BF	Sugar Cane	40

Table 2. Statistical Determination of the Number of Baseline Grids

Decision Parameters	Selected Value	Normal Variate
Significance = alpha	5%	$z_{1\text{-alpha}}$ = 1.64
Power = 1 - beta	80%	$z_{1\text{-beta}}$ = 0.84
Delta as % of Baseline Mean	20%	

Chemical-Specific Parameters	Arsenic (mg/kg)	Copper (mg/kg)	Selenium (mg/kg)	Atrazine (ug/kg)**
Desired Resolution	1.32	12.7	0.60	13.47
Baseline Mean*	6.61	63.7	2.98	67.33
Baseline Standard Deviation*	4.49	55.6	2.33	25.65
n (Number of Samples)	**72**	**119**	**95**	**23**

*Computed based on Phase 2 Sugercane 40-acre Composite (SC) Data

**3 outlier results are excluded

Table 3. Statistical Comparative Tests

Difference Hypothesis	Test	Comparison	Type
Area-wide Difference	Wilcoxon Rank Sum (WRS)	Median	Non-parametric
	Gehan	Median	Non-parametric
	Student's two-sample t-test	Mean	Parametric
	Satterthwaite t-test	Mean	Parametric
Localized Difference	Slippage	High concentrations	Non-parametric
	Quantile	High concentrations	Non-parametric
	Two-sample test of proportions	Percent of measurements above a given cutoff	Non-parmetric

Table 4. Summary of Sample Plan

Areas	Number of Samples		Parameters*
Sugar Cane Cultivation Area	119 composite samples	Annually (40-acre eight point composite soil sample using close composite methodology– top 6'')	Arsenic, Copper, Selenium Clomazone Pendimethalin Analytical test method will be developed for fungicides Caramba and Headline by Florida based laboratory.
Pump Stations	No Sample	If no staining / stressed or disturbed vegetation.	
	0 sample 1 each site	If impacts observed (five point composite soil sample – top 6'')	EPA Method 602 EPA Method 610 FL-PRO
Chemical and Equipment Storage Areas	No Sample	If no staining / stressed or disturbed vegetation	
	1 each site	If impacts observed (five point composite soil sample – top 6'')	EPA Method 602 EPA Method 610 FL-PRO Arsenic, Copper, Selenium Clomazone Pendimethalin 8151 Analytical test method will be developed for fungicides Caramba and Headline by Florida based laboratory.

**Parameter Descriptions*

EPA Method 602 (purgeable aromatics)
EPA Method 610 (polynuclear aromatic hydrocarbons)
FL-PRO (total residual petroleum hydrocarbons)
Total Arsenic
Copper by EPA Method 6010/7471
Selenium
Clomazone by EPA Method 8141
Pendimethalin by EPA Method 8081
EPA Method 8151 (chlorinated herbicides)

3.1.4 References

Department of the Navy (DON). "Guidance for Environmental Background Analysis. Volume I: Soil." NFESC. User's Guide. UG-2049-ENV. April 2002.

U.S. Environmental Protection Agency (EPA). "Methods for Evaluating the Attainment of Cleanup Standards. Vol. 1: Soils and Solid Media." Office of Policy, Planning, and Evaluation. Washington, D. C. EPA 230/02-89-042. 1989

United States Environmental Protection Agency (EPA). "Data Quality Objectives Process for Hazardous Waste Site Investigations. EPA QA/G-4HW Final." EPA/600/R-00/007. January 2000

4.0 STANDARDIZED FORM: BMP SITE VERIFICATION FINDINGS SUMMARY

Future BMP site verification visits will be conducted at the request of the District.. BMP implementation will be reviewed per the guidelines and 'Implementation Requirements' described for each BMP earlier in this document as well as taking site specific issues and time of year into account. The site verification findings, including a written review of observations, site photographs taken, and a summary of records reviewed, are expected to be provided by the field reviewer in a detailed report. The field verified implementation status of each BMP will be classified in one of three categories:

Implementation Verified
Implementation Verified with Comment
Additional Attention Required

The standardized form for reporting *BMP Site Verification Findings Summary* to be included in the BMP field verification report is included in **Appendix B**.

APPENDIX A

Derivation of "No Application Periods" for Interim Use Pesticides

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I. INTRODUCTION

The South Florida Water Management District (SFWMD) is actively acquiring agricultural lands in South Florida in connection with the Everglades Restoration Project. These lands are slated for various water management projects including conversion to water attenuation reservoirs, creation of stormwater treatment areas (STAs) for removal of phosphorus and other nutrients, and restoration of wetlands in areas formerly drained for agriculture. All of these projects will likely attract large numbers of birds and other wildlife. Since all of these areas were, or still are, agricultural areas, they have probably been exposed to heavy pesticide applications for decades and residues of some of those pesticides very likely still remain in the soil. Some of the pesticides used were organochlorine compounds such as toxaphene and DDT, which are now banned due to their extreme persistence in soil and their tendency to bioaccumulate in the food web. Residues of these chemicals in soils at a recent wetland restoration project in Florida (Lake Apopka) have resulted in bird die-offs following flooding of the site.

Following land acquisition for a water management project, there may be a delay of up to five years before completion of the project and actual flooding of the wetland or reservoir occurs. During this "interim use period," the former landowner is usually allowed to lease the property and continue with existing agricultural uses. Because of the risks to fish and wildlife that will be attracted to the site following flooding, questions arise as to what types of pesticides, and in what quantities, should be allowed to be applied to these lands during the interim use period. This document was developed in response to these questions.

Because the U.S. Fish and Wildlife Service (Service) must approve these interim uses of grant lands, it has sought to discover what chemicals are being used in conjunction with the uses. The Service has sought the assistance of the SFWMD in this effort; however, the Service and the SFWMD do not agree as to the necessity for, and the feasibility of, obtaining this information from the former landowner. This issue has delayed the finalization, acceptance and implementation of a mutually agreeable protocol by which the SFWMD can seek, and the Service grant, approval of the interim uses. Until the protocol can be developed, the Service cannot provide formal approval of the uses.

In order to resolve this issue, the Service has developed an alternative to requiring the SFWMD to submit chemical use information. Instead, the protocol itself will contain the following chemical use schedule, which the SFWMD will incorporate the pertinent portions into any leases, reservations, or any other methods of allowing an interim use on lands acquired with grant funds. The schedule identifies chemicals which may be used on grant lands, and the amount of time the use of each chemical must cease prior to the incorporation of the parcel into an Everglades restoration project. The time period for each chemical is based upon that chemical's $T_{1/2}$ value (half-life). Accordingly, regardless of which chemicals had been applied to a specific parcel before it was acquired by the SFWMD with grant funds, the SFWMD will be authorized only to allow the use of certain chemicals for certain amounts of time.

II. METHODS

Information on persistence and degradation, toxicity, and use of pesticides in Florida was obtained from various internet databases and published references. The publication *Summary of Agricultural Pesticide Usage in Florida: 1995 - 98* (Shahane, 1999) was reviewed to develop a list of pesticides commonly used in South Florida. Data on half-life, degradation rate, and toxicity of these substances were obtained primarily from the Hazardous Substances Data Bank (HSDB), the Environmental Fate Database (EFDB), and the Extension Toxicology Network (EXTOXNET). For many of the chemicals used in Florida, environmental fate has been researched extensively and numerous literature values for half-life and/or degradation rate were available. For some chemicals, only a few values could be located.

Degradation rates of pesticides in soil can vary tremendously depending on soil type, climate, soil pH, moisture content, depth beneath the surface, and other variables. Therefore, the $T_{1/2}$s and degradation rates reported in the literature for the same chemical may vary over a wide range, depending on the conditions in the different studies. No attempt was made to select only those studies most appropriate to conditions in Florida soils. All relevant values for a chemical, including both field and laboratory experiments, were included in the database for that chemical; however, obviously irrelevant studies (such as those using sterile soils) were not included.

Many studies presented calculated soil $T_{1/2}$ values for the chemical being studied, and these values were entered directly into the database for that chemical. Other studies did not calculate $T_{1/2}$ values, but instead presented raw degradation rates. For example, an entry might state that the chemical was 67% degraded in 10 days. For these situations, the $T_{1/2}$ was calculated using the following formula (assuming 1st order kinetics) (Casarett et al., 1996):

$$T_{1/2} = \frac{.693 * t}{2.303(2 - \log(100 - d))}$$

where t = time since application and d = percent degraded.

All $T_{1/2}$ values obtained directly from the online databases and those calculated from raw degradation data were entered into a spreadsheet (see Appendix A). Using all of these data, median and maximum $T_{1/2}$ values were determined for each chemical. In addition, some studies presented persistence times for pesticides, i.e., the length of time required for all of the chemical to be degraded. Although $T_{1/2}$ values could not be calculated from these data, the range of reported persistence was also recorded. Table 1 summarizes all half-life, persistence, and toxicological information considered for each chemical.

The "no application period" is defined as the period of time prior to conversion of the agricultural land to conservation purposes (e.g., flooding to create wetlands) during which a particular pesticide hazardous to fish and/or wildlife should *not* be applied, in order to allow adequate time for breakdown

of pesticide residues before use of the land by Service trust resources. This period of time was defined as 5 times the median half-life, representing 97 percent degradation. Based on this 5 X $T_{1/2}$ value, the pesticide was placed into one of the following no application periods: 3 months, 6 months, 1 year, or 2 years (Table 1). Due to uncertainties of the planning and scheduling process, it was decided that those rare pesticides requiring more than 2 years to break down should not be applied at all.

In those cases where $T_{1/2}$ data were scanty or differed substantially from persistence data, professional judgement was used. Preference was sometimes given to persistence data, particularly in the case of highly toxic compounds. For example, the pesticide disulfoton, which is highly toxic to fish and wildlife, was placed in a 1 year no application category based on the longer persistence of toxic metabolites compared to the parent compound. In this case, use of five times the median half-life of the parent compound would have underestimated the breakdown time to nontoxic products (Table 1).

III. RECOMMENDATIONS

A. The following pesticides are approved for application during the interim use period with **no restrictions** other than those required by the label:

2,4-D	glyphosate
Bacillus thuringiensis (Bt)	metolachlor
copper compounds	metribuzin
dicamba	norflurazon
diquat	potassium salts
diuron	sethoxydim
EPTC	sulfur
fluazifop-p-butyl	simazine

B. The following lists include some of the most commonly used pesticides in South Florida that are thought to be hazardous to fish and wildlife. These chemicals are approved for application during the interim use period with the following restriction: Use of these chemicals should be discontinued for the indicated time period prior to flooding agricultural lands for wetland restoration, creating water retention reservoirs, or any other activity likely to attract fish and wildlife to the site.

Use of the following should be **discontinued at least 3 months** prior to flooding:

acephate	malathion
alachlor	methidathion
diazinon	methyl parathion
dimethoate	oxamyl
	trichlorfon

Use of the following should be **discontinued at least 6 months** prior to flooding:

aldicarb	ethoprop
azinphos-methyl	ethyl parathion
carbaryl	permethrin
carbofuran	phorate
chlorpyrifos	terbufos

Use of the following should be **discontinued at least 1 year** prior to flooding:

atrazine	esfenvalerate
cyfluthrin	fenamiphos
disulfoton	fonofos
endosulfan	

Use of the following should be **discontinued at least 2 years** prior to flooding:

dicofol	trifluralin

C. Due to their high toxicity and/or extreme persistence in the environment, the following chemicals **should not be applied** during the interim use period to lands being acquired for wetland restoration, water retention, or similar purposes. Interim uses which require these chemicals will not be permitted.

benomyl	paraquat

D. Other pesticides which do not appear on the above lists may come up from time to time. These will be evaluated on a chemical-by-chemical basis and added to the appropriate category above.

E. *Any* pesticide, regardless of the above categories, shown to already be present in soil at or above the appropriate sediment guideline, may require additional restrictions. For example, copper is a metal which does not degrade in the environment and may already be present in some soils (e.g., orchards) at levels above the Florida Department of Environmental Protection's Sediment Quality Assessment Guideline (MacDonald, 1994). In this case, further use of copper compounds during the interim use period would have to be reduced or eliminated altogether. These situations will be evaluated on a case-by-case basis. Add: can't push over SQAGs.

IV. SOURCES OF INFORMATION

A. Publications

Casarett, L.J., M.O. Amdur and C.D. Klaasen (eds.). 1996. Casarett and Doull's Toxicology: The Basic Science of Poisons, 5th Edition. McGraw Hill.

1997 Farm Chemicals Handbook (Vol. 83). Meister Publishing Co., Willoughby, Ohio.

MacDonald, D.D. 1994. Approach to the Assessment of Sediment Quality in Florida Coastal Waters. Florida Department of Environmental Protection, Office of Water Policy, Tallahassee, Florida.

Milne, G.W.A. 1995. CRC Handbook of Pesticides. CRC Press, Boca Raton, Florida. 402 pp.

Shahane, A.H. 1999. Summary of Agricultural Pesticide Usage in Florida: 1995-98. Florida Department of Agriculture and Consumer Services, Tallahassee, Florida. 111 pp.

B. Online Databases

Environmental Fate Database, Syracuse Research Corporation, Syracuse, New York. http://esc.syrres.com/efdb.htm

Hazardous Substances Data Bank (HSDB), TOXNET, National Library of Medicine, Washington, D.C. http://toxnet.nlm.nih.gov/

Extension Toxicology Network (EXTOXNET), Oregon State University, Corvallis, Oregon. http://ace.orst.edu/info/extoxnet/ -

Table 1. Environmental and Toxicological Characteristics of Pecticides Considered in Establishing the No Application Period.

Pesticide	No Application	$T_{1/2}$ soil (days)		Persistence	5 X $T_{1/2}$	Class	Bird Kills?[1]	LD50 (rat, oral)	LC50 (fish)
	Period	median	max		(months)			mg/kg	mg/l
acephate	3 mo.	3	14		0.5	OP	YES	866 - 945	>1000
alachlor	3 mo.	14	133	6 wk - >1 yr	2.3	acetanilide		930 - 1350	(3.7)
aldicarb	6 mo.	19	990	1 - 15 d	3.2	carbamate	YES	1	1.5
atrazine	1 yr.	63.8	1898	73 d - 2 yr	10.6	triazine		1780	slightly toxic
azinphos-methyl	6 mo.	37.0	484		6.2	OP	YES	4.4 - 16	0.003
benomyl	Do Not Apply	270	360	15 d - 4 wk	45.0	carbamate		>10,000	.006 - 14
carbaryl	6 mo.	25.5	379.4	40 d	4.3	carbamate		246 - 283	28
carbofuran	6 mo.	29	334.2	56 d - 14.5 mo	4.8	carbamate	YES	8	0.24
chlorpyrifos	6 mo.	22.6	84		3.8	OP	YES	96 - 270	0.18
cyfluthrin	1 yr.	56.0	63.0		9.3	pyrethroid			.00068 - .022
diazinon	3 mo.	11.5	35	3 - 14 wk	1.9	OP	YES	1250	toxic
dicofol	2 yr.	60		>1 yr	10.0	OC		570 - 595	0.12 - 0.37
dimethoate	3 mo.	11	122		1.8	OP	YES	235	30.2
disulfoton	1 yr.	5.6	70.0	56 d - 2 yr	0.9	OP	YES	1.9 - 12.5	0.038
endosulfan	1 yr.	40.5	150	10 - 160 d	6.7	OC	YES	18 - 160	0.001
esfenvalerate	1 yr.	52.5	90		8.8	pyrethroid		458	.0002 - .001
ethoprop	6 mo.	19.5	84		3.3	OP	YES	61.5	
ethyl parathion	6 mo.	22	2957.2	20 d - >16 yr	3.7	OP	YES	2	1.5
fenamiphos	1 yr.	43.5	470.2	92 d	7.3	OP	YES	2 - 19	0.11 - 9.6
fonofos	1 yr.	42.5	93.3		7.1	OP	YES	8 - 17.5	0.05
malathion	3 mo.	1.7	6.0		0.3	OP		5500	200
methamidophos	3 mo.	4.8	12.0		0.8	OP	YES	16 - 21	25 - 100
methidathion	3 mo.	7.0	23.0		1.2	OP		25 - 54	.002 - .014
methyl parathion	3 mo.	15.0	915.6	3 - 5 mo.	2.5	OP	YES	6 - 50	1.9 - 8.9
oxamyl	3 mo.	12.5	50		2.1	carbamate	YES	5.4	4.2 - 17.5
paraquat	Do Not Apply	1000	2409		166.7	bipyridyl		150	13 - 32
permethrin	6 mo.	34	38		5.7	pyrethroid		430 - 4000	.0018 - .0054
phorate	6 mo.	23.3	167.6	2 wk - 4.5 mo	3.9	OP	YES	2 - 4	0.002
propargite (omite)	[illegible]					??		1480 - 2200	.031 - .100
terbufos	6 mo.	19.5	151.8		3.2	OP	YES	1.3 - 1.6	.001 - .39
trichlorfon	3 mo.	0.97	140	8 d - 1.5 mo.	0.2	OP		450 - 650	.26 - 2.5
trifluralin	2 yr.	88.2	405	157 d - >40 wk	14.7	dinitroanilline		>10,000	.02 - 3.4

[1]YES in this column indicates pesticides that have caused documented die-offs of migratory birds.

Appendix A. Reported Soil Half-Lives (in days) for South Florida Pesticides.*

alachlor	aldicarb	atrazine	azinphos-methyl	benomyl	carbaryl	carbofuran	chlorpyrifos	cyfluthrin	diazinon	dicofol	dimethoate	disulfoton	endosulfan
Lit. $T_{1/2}$ (d)	Lit. $T_{1/2}$ (d)	Lit. $T_{1/2}$ (d)	Lit. $T_{1/2}$ (d)	Lit. $T_{1/2}$ (d)	Lit. $T_{1/2}$ (d)	Lit. $T_{1/2}$ (d)	Lit. $T_{1/2}$ (d)	Lit. $T_{1/2}$ (d)	Lit. $T_{1/2}$ (d)	Lit. $T_{1/2}$ (d)	Lit. $T_{1/2}$ (d)	Lit. $T_{1/2}$ (d)	Lit. $T_{1/2}$ (d)
15	9.9	15	5	180	22	26	81	56	7	60	2.5	1	32
7	23	300	484	360	12	110	28	63	14		4	4	150
14	990	1898	21		25.5	14	84	Calc. $T_{1/2}$	35		122	7	39
4	7	53	68		8	28	7	42.1	11.5		7	56	42
49	12	113	10		12	60	18		6.3		11	70	Calc. $T_{1/2}$
7.8	23	28	30		Calc. $T_{1/2}$	75	11.5				29	Calc. $T_{1/2}$	42.0
Calc. $T_{1/2}$	2	181	Calc. $T_{1/2}$		379.4	30	25.1				36	4.3	24.2
133.3	15	115	44.0		195.2	60	8.7				Calc. $T_{1/2}$	3.1	
	54	48	51.3		51.7	28	Calc. $T_{1/2}$				6.6	10.5	
	20	357			43.8	43	20.1				53.1		
	46	78				53	30.0						
	18	20				8							
	154	58				10							
	60	67				14							
	9	Calc. $T_{1/2}$				73							
	12	84.0				Calc. $T_{1/2}$							
	20	48.3				9.7							
	361	20.0				2.8							
	Calc. $T_{1/2}$	10.0				334.2							
	8.9	48.3				113.4							
	2.0	127.5				22.6							
		56.7											
		26.4											
		134.3											
		279.9											
		149.9											
		36.5											
		89.7											
		23.4											
		92.3											
		60.6											

*Values were taken directly from the literature or calculated from degradation rates.

Appendix A. Reported Soil Half-Lives (in days) for South Florida Pesticides.*

esfenvalerate	ethoprop	ethyl parathion	fenamiphos	fonophos	malathion	methamidophos	methidathion	methyl parathion	oxamyl	paraquat	permethrin	phorate
Lit. $T_{1/2}$ (d)	Lit. $T_{1/2}$ (d)	Lit. $T_{1/2}$ (d)	Lit. $T_{1/2}$ (d)	Lit. $T_{1/2}$ (d)	Lit. $T_{1/2}$ (d)	Lit. $T_{1/2}$ (d)	Lit. $T_{1/2}$ (d)	Lit. $T_{1/2}$ (d)	Lit. $T_{1/2}$ (d)	Lit. $T_{1/2}$ (d)	Lit. $T_{1/2}$ (d)	Lit. $T_{1/2}$ (d)
15	25	7	50	40	1	1.9	5	4	11	1000	30	82
90	3	11	2.1	30	6	4.8	7	45	15	2409	38	2
	56	112	4	45	Calc. $T_{1/2}$	6.1	23	10	6	Calc. $T_{1/2}$		6
	14	182	11	18	4.3	12		15	14	268.7		30
	84	22	Calc. $T_{1/2}$	82	2.3	Calc. $T_{1/2}$		Calc. $T_{1/2}$	4			69
	12	23	13.1	Calc. $T_{1/2}$	1.0	2.7		4.3	33			Calc. $T_{1/2}$
	16	Calc. $T_{1/2}$	138.2	93.3	0.3			915.6	8			167.6
	73	12.1	462.8	75.0				203.1	50			23.3
	Calc. $T_{1/2}$	34.2	470.2	28.5								7.5
	23.0	2.4	43.5									98.2
	12.6	4.9										20.8
		16.2										1.6
		131.5										
		20.0										
		2957.2										
		224.9										

*Values were taken directly from the literature or calculated from degradation rates.

Appendix A. Reported Soil Half-Lives (in days) for South Florida Pesticides.*

terbufos	trichlorfon	trifluralin
Lit. $T_{1/2}$ (d)	Lit. $T_{1/2}$ (d)	Lit. $T_{1/2}$ (d)
5	1.1	38
22	140	61
16.9	0.6	211
86.6	0.8	405
12.8		Calc. $T_{1/2}$
66.5		66.7
10		109.8
4.5		
Calc. $T_{1/2}$		
22.5		
12.1		
151.8		
97.8		

*Values were taken directly from the literature or calculated from degradation rates.

Appendix B. Half-life Calculation Worksheet.

Atrazine	Lit. $T_{1/2}$	units	$T_{1/2}$ (days)	% degraded	time	units	Calc. $T_{1/2}$	$T_{1/2}$ (days)
	0.5	mo	15	50	12	wk	12.0	84.0
	10	mo	300	70	12	wk	6.9	48.3
	5.2	yr	1898	50	20	d	20.0	20.0
	53	d	53	75	20	d	10.0	10.0
	113	d	113	70	12	wk	6.9	48.3
	28	d	28	29	9	wk	18.2	127.5
	181	d	181	60	75	d	56.7	56.7
	115	d	115	86	75	d	26.4	26.4
	48	d	48	71	8	mo	4.5	134.3
	357	d	357	13.8	60	d	279.9	279.9
	78	d	78	75	10	mo	5.0	149.9
	20	d	20	85	100	d	36.5	36.5
	58	d	58	90	298	d	89.7	89.7
	67	d	67	93	3	mo	0.8	23.4
				86	262	d	92.3	92.3
				95	262	d	60.6	60.6

Trichlorfon	Lit. $T_{1/2}$	units	$T_{1/2}$ (days)	Aldicarb	K_{el}	units	Calc. $T_{1/2}$
	1.1	d	1.1		0.078	d^{-1}	8.9
	140	d	140		0.35	d^{-1}	2.0
	14	hr	0.6				
	20	hr	0.8				

Phorate	Lit. $T_{1/2}$	units	% degraded	time	units	Calc. $T_{1/2}$
	82	d	18	48	d	167.6
	2	d	76	48	d	23.3
	6	d	90	25	d	7.5
	30	d	47	90	d	98.2
	69	d	95	90	d	20.8
			95	7	d	1.6

Carbaryl	Lit. $T_{1/2}$	units	% degraded	time	units	Calc. $T_{1/2}$	$T_{1/2}$ (days)
	22	d	12	10	wk	54.2	379.4
	12	d	22	10	wk	27.9	195.2
	25.5	d	80	120	d	51.7	51.7
	8	d	85	120	d	43.8	43.8
	12	d					

Methyl Parathion	Lit. $T_{1/2}$	units	% degraded	time	units	Calc. $T_{1/2}$	$T_{1/2}$ (days)
	4	d	99.5	33	d	4.3	4.3
	45	d	64	45	mo	30.5	915.6
	10	d	99	45	mo	6.8	203.1
	15	d					

Appendix B. Half-life Calculation Worksheet.

Alachlor	% degraded	time	units	Calc. $T_{1/2}$	$T_{1/2}$ (days)
	85	1	yr	0.4	133.3
Carbofuran	% degraded	time	units	Calc. $T_{1/2}$	$T_{1/2}$ (days)
	95	42	d	9.7	9.7
	97	14	d	2.8	2.8
	7	5	wk	47.7	334.2
	60	5	mo	3.8	113.4
	99	5	mo	0.8	22.6
Chlorpyrifos	% degraded	time	units	Calc. $T_{1/2}$	$T_{1/2}$ (days)
	62	4	wk	2.9	20.1
	50	30	d	30.0	30.0
Cyfluthrin	% degraded	time	units	Calc. $T_{1/2}$	$T_{1/2}$ (days)
	90	140	d	42.1	42.1
Dimethoate	% degraded	time	units	Calc. $T_{1/2}$	$T_{1/2}$ (days)
	77	2	wk	0.9	6.6
	98	10	mo	1.8	53.1
Disulfoton	% degraded	time	units	Calc. $T_{1/2}$	$T_{1/2}$ (days)
	68	1	wk	0.6	4.3
	79	1	wk	0.4	3.1
	90	5	wk	1.5	10.5
Endosulfan	% degraded	time	units	Calc. $T_{1/2}$	$T_{1/2}$ (days)
	50	42	d	42.0	42.0
	70	42	d	24.2	24.2
Ethoprop	% degraded	time	units	Calc. $T_{1/2}$	$T_{1/2}$ (days)
	19	1	wk	3.3	23.0
	32	1	wk	1.8	12.6
Ethyl parathion	% degraded	time	units	Calc. $T_{1/2}$	$T_{1/2}$ (days)
	96	8	wk	1.7	12.1
	20	11	d	34.2	34.2
	96	11	d	2.4	2.4
	95	3	wk	0.7	4.9
	95	10	wk	2.3	16.2
	10	20	d	131.5	131.5
	50	20	d	20.0	20.0
	3	130	d	2957.2	2957.2
	33	130	d	224.9	224.9

Appendix B. Half-life Calculation Worksheet.

Fonophos	% degraded	time	units	Calc. $T_{1/2}$	$T_{1/2}$ (days)
	59	4	mo	3.1	93.3
	67	4	mo	2.5	75.0
	64	6	wk	4.1	28.5

Malathion	% degraded	time	units	Calc. $T_{1/2}$	$T_{1/2}$ (days)
	80	10	d	4.3	4.3
	95	10	d	2.3	2.3
	50	24	hr	24.0	1.0
	90	24	hr	7.2	0.3

Paraquat	% degraded	time	units	Calc. $T_{1/2}$	$T_{1/2}$ (days)
	13	54	d	268.7	268.7

Terbufos	% degraded	time	units	Calc. $T_{1/2}$	$T_{1/2}$ (days)
	35	14	d	22.5	22.5
	80	28	d	12.1	12.1
	12	4	wk	21.7	151.8
	18	4	wk	14.0	97.8

Trifluralin	% degraded	time	units	Calc. $T_{1/2}$	$T_{1/2}$ (days)
	85	0.5	yr	0.18	66.7
	90	1	yr	0.30	109.8

Fenamiphos	% degraded	time	units	Calc. $T_{1/2}$	$T_{1/2}$ (days)
	94.6	55	d	13.1	13.1
	24.1	55	d	138.2	138.2
	9	63	d	462.8	462.8
	9.8	70	d	470.2	470.2
	67.2	70	d	43.5	43.5

Azinphos-methyl	% degraded	time	units	Calc. $T_{1/2}$	$T_{1/2}$ (days)
	50	44	d	44.0	44.0
	93	197	d	51.3	51.3

Methamido-phos	% degraded	time	units	Calc. $T_{1/2}$	$T_{1/2}$ (days)
	92	10	d	2.7	2.7

APPENDIX B

APPENDIX B
SITE VERIFICATION CHECKLIST

United States Sugar Corporation
Palm Beach, Hendry, and Glades Counties
State of Florida

Best Management Practices (BMP) Site Verification Checklist

Tract No.:
SFWMD Representative(s):
Property Representative(s):
Inspection Date:

BMP	Description/Comment	Implementation Verified	Additional Attention Required
Property Use and Structures			
Housekeeping			
General Site -			
Storage Areas -			
Additional Observations -			
Employee Training			
Schedule -			
Topics -			

Additional Observations -			
Hazardous Material/ Chemical Use			
Chemicals Used -			
Application Type -			
Application Schedule -			
Material Records -			
Additional Observations:			
Petroleum Products			
Product Use -			
Pump Station(s) -			
Storage Location(s) -			
Additional Observations:			
Chemical Storage			
Storage Location -			
Building/Area Type -			
Pump Station(s) -			

Additional Observations:			
Mixing & Loading Areas			
Area Description -			
Area Observations -			
Additional Observations:			
Waste Storage and Disposal			
Waste Types -			
Storage Location -			
Waste Disposal -			
Waste Disposal Records -			
Additional Observations:			
Water Management			
Observations -			
Water Mgmt Controls -			
Weather Monitoring -			
Additional Observations:			
Erosion/Sediment Controls			
Erosion Controls -			

Sediment Controls -			
Additional Observations:			
Exotic Vegetation Management			
Observations -			
Physical Controls -			
Biological Controls -			
Chemical Controls -			
Additional Observations:			
General Field Notes			

Notes:

N/A - Not Applicable

APPENDIX C

APPENDIX C
EMERGENCY RESPONSE and CHEMICAL HAZARD INFORMATION PHONE NUMBERS

Emergency Reporting
For Ambulance, Fire, or Police **Dial 911**

State Warning Point (Department of Community Affairs, Division of Emergency Management)	24hrs. Toll Free 1-800-320-0519 or (850) 413-9911
National Response Center	24hrs. Toll Free 1-800-424-8802

(Federal law requires that anyone who releases into the environment a reportable quantity of a hazardous substance [including oil when water is or may be affected] or a material identified as a marine pollutant, must immediately notify the NRC).

DEP Emergency Response, 24 hrs. Toll Free **1-800-342-5367**

HELP LINE NUMBERS

Chemical hazard information and regulatory questions

• **CHEMTREC HOT LINE (Emergency only) 24 hrs**	Toll Free 1-800-424-9300
• SARA Title III help line	Toll Free 1-800-535-0202
• CERCLA / RCRA help line	Toll Free 1-800-424-9346
• Pesticide Container Recycling Program Pesticide Information Officer at University of Florida	352-392-4721

COUNTY COOPERATIVE EXTENSION OFFICES

Pam Beach County	559 N. Military Trail West Palm Beach, FL 33415	(561) 233-1700
Hendry County	1085 Pratt Boulevard Dallas B Townsend Agricultural Center Labelle, FL 33935	(863) 674-4092
Glades County	900 US Highway 27 SW Moore Haven, FL 33471	(863) 946-0244

STATE OF FLORIDA AGENCIES

Florida Department of Agriculture and Consumer Services

Bureau of Pesticides	(850) 487-0532
Bureau of Compliance Monitoring	(850) 488-3314
Division of Agriculture and Environmental Services	(850) 488-3731

Florida Department of Environmental Protection

FDEP Stormwater/Nonpoint Source Management Section (Tallahassee)	(850) 488-3605
FDEP Hazardous Waste Management Section (Tallahassee)	(850) 488-0300

FDEP District offices - West Palm Beach	(561) 681-6800

Florida Fish and Wildlife Conservation Commission

620 South Meridian Street Tallahassee, FL 32301	(850) 488-4066 or (850) 488-4069

Water Management Districts

South Florida Water Management District (West Palm Beach)	(561) 686-8800 or 1-800-432-2045

University of Florida (Gainesville)

Pesticide Information Office	(352) 392-4721
Agricultural Law Policy Office	(352) 392-1881

UNITED STATES AGENCIES

EPA National Offices & Numbers

Office of Water (202)-382-5700
4604, 401 M Street, SW
Washington, DC 20460
(Provides Information on Clean Water Act and related water pollution regulations)

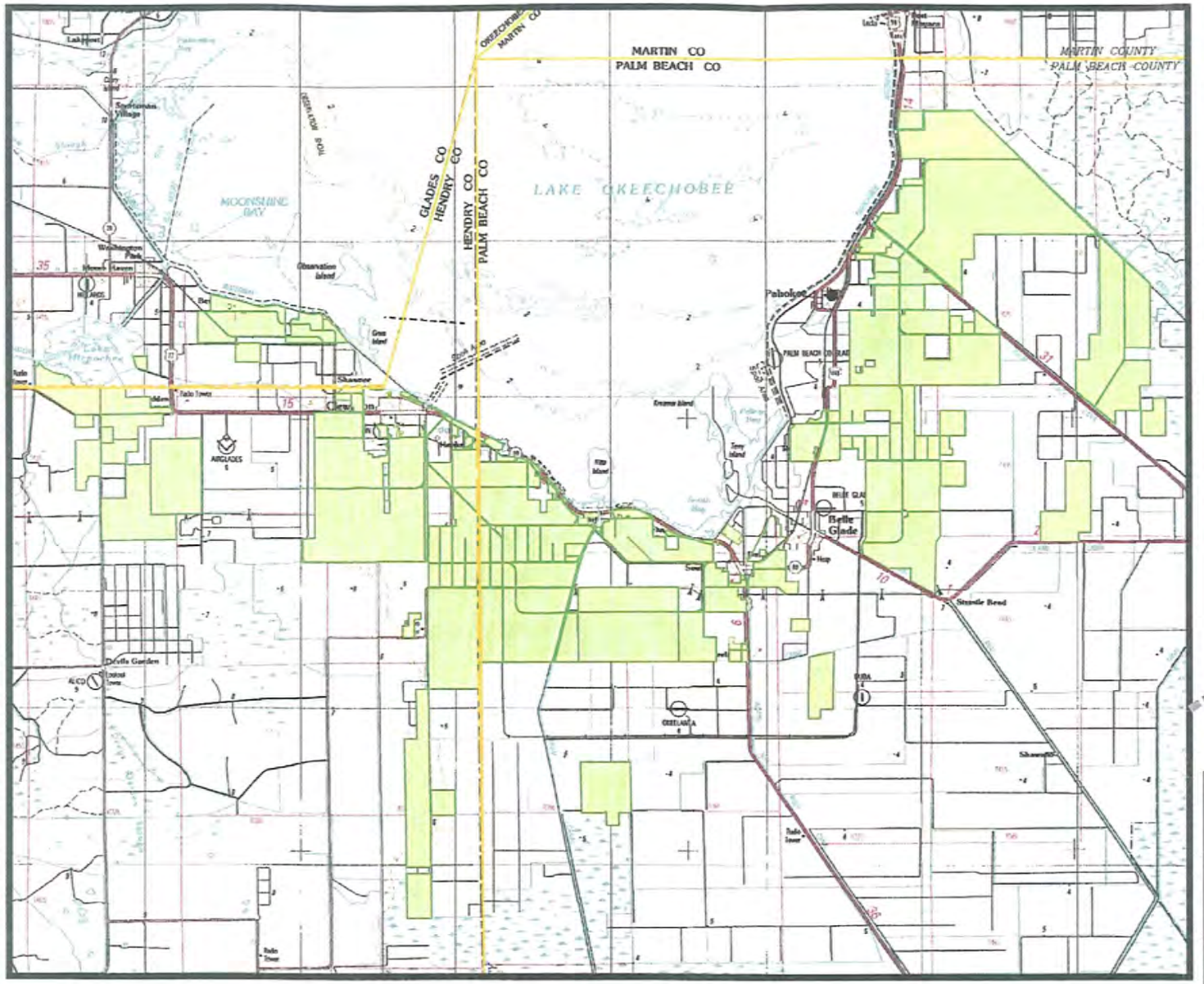
Florida Administrator of EPA Pesticide Registration

Bureau of Pesticides/ Division of Inspection (850) 487-2130
Dept. of Agriculture and Consumer Services
3125 Conner Blvd., MD-2
Tallahassee, FL 32399-1650

National Pesticide Telecommunications Network

Provides information on pesticides and pesticide poisonings. 1-800-858-7378
Operating 24 hours a day, 365 days a year.

FIGURE 1



- PARCELS USED FOR CULTIVATION OF SUGAR CANE

UNITED STATES SUGAR CORPORATION
111 PONCE DE LEON AVENUE
CLEWISTON, FL.

JOB NO.: 38617-027 DATE: SEPTEMBER 2008

SUGAR CANE PARCEL LOCATION VICINITY MAP

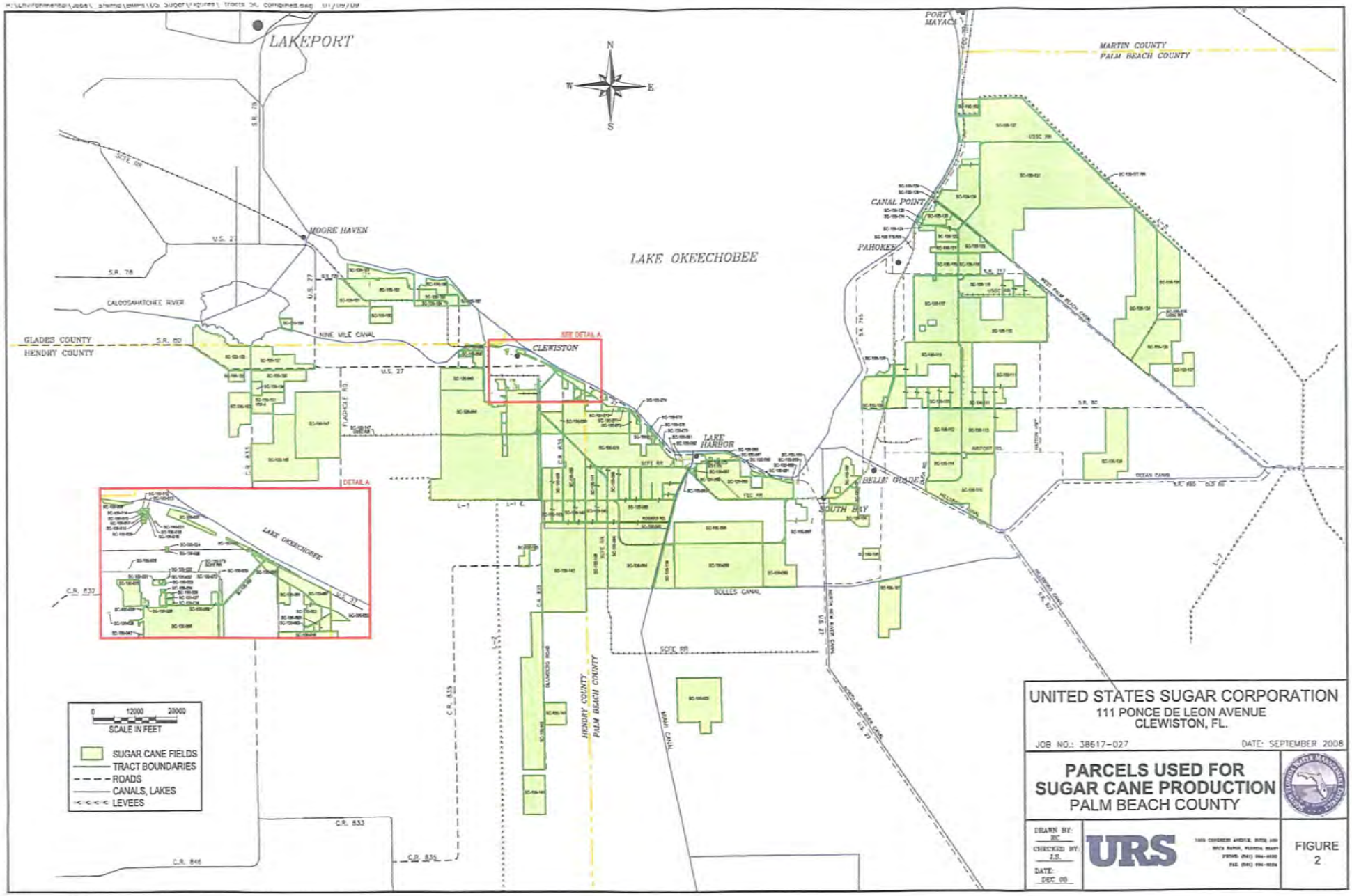
DRAWN BY: RC
CHECKED BY: J.S.
DATE: DEC 08

URS

FIGURE 1

R:\Environmental\Jobs_Shared\RMPA\US Sugar\Figures\ topo SC ALL.dwg 01/09/09

FIGURE 2



UNITED STATES SUGAR CORPORATION
111 PONCE DE LEON AVENUE
CLEWISTON, FL.

JOB NO.: 38617-027 DATE: SEPTEMBER 2008

PARCELS USED FOR SUGAR CANE PRODUCTION
PALM BEACH COUNTY

DRAWN BY: JC
CHECKED BY: J.S.
DATE: DEC 08

URS

FIGURE 2

SCHEDULE 3.3

DRAFT REPORT
BEST MANAGEMENT PRACTICES PLAN
CITRUS

UNITED STATES SUGAR CORPORATION
HENDRY COUNTY, FLORIDA

Prepared for

South Florida Water Management District
3301 Gun Club Road
West Palm Beach, Florida 33406

May 8, 2009

Prepared by

URS Corporation
7800 Congress Avenue, Suite 200
Boca Raton, Florida 33487

URS

May 8, 2009

Mr. Robert Taylor
Lead Environmental Engineering Specialist
Land Management and Land Acquisition Division
South Florida Water Management District
3301 Gun Club Road
West Palm Beach, Florida 33406

Subject: **Environmental Best Management Practices Plan-Citrus**
United States Sugar Corporation
Hendry County
State of Florida
Job # 38617-027

Dear Mr. Taylor,

URS Corporation (URS) is pleased to present this Environmental Best Management Practices (BMP) Plan for the United States Sugar Corporation (USSC) citrus properties in Hendry County, Florida.

It is URS' understanding that as the property owner, the South Florida Water Management District (District) desires to have in place a set of general environmental BMPs for the citrus operations that are designed to maintain/protect water quality in accordance with the State's water quality standards, maintain the soil and water quality at the site which will not prohibit the District from using property as a water attenuation reservoir in the near future, and that will concurrently allow for continued economically-viable agricultural production on the site. This BMP plan is designed to meet these expectations by providing guidance to the USSC property on environmental preventative measures to be proactively implemented.

Respectfully Submitted,

URS Corporation

Edward A. Leding, P.G.
Project Manager

Timothy B. DeBord
Vice President
URS Jacksonville

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1.0 OVERVIEW

1.1 INTRODUCTION

The South Florida Water Management District (District) has acquired approximately 72,500 acres of the United States Sugar Corporation (USSC) properties in Palm Beach, Hendry, Glades and Gilchrist Counties, Florida for future restoration purposes such as water storage reservoirs and wetlands. **Figure 1** illustrates the location of USSC citrus properties. Of the 72,500 acres, an estimated 32,000 acres are used for the cultivation of citrus. Currently 21,500 acres are being actively cultivated for citrus. **Figure 2** illustrates the tracts that are utilized for the cultivation of citrus. This Environmental Best Management Practices (BMP) Plan has been prepared for the citrus production portions of the acquired properties. Portions of the citrus acreage are subleased each year for the cultivation of vegetables. These acres that are used for growing vegetables or other crops should follow the BMP for vegetable farming which is included as part of the U.S. Sugar BMP Plan for Sugar Cane Production. This BMP Plan shall be implemented by future tenants of the District that engage in citrus production on portions of the acquired properties.

During the interim period (from acquisition to construction/land conversion), the District intends to utilize the property for continued agricultural operations primarily for the cultivation of citrus. In general, this BMP requirements document is not regulatory or enforcement based; however, failure of a tenant to implement the BMP Plan will constitute a breach of the tenant's lease with the District. BMPs are production systems and management strategies scientifically shown to minimize adverse water quality and other environmental impacts of citrus production. BMPs can be defined as those operational procedures designed to achieve greatest agronomic efficiency in food and fiber production, while limiting the off-site effects of agricultural operations and maintaining an economically viable farming operation. All BMPs must protect the environment and be economically viable.

There are several sources of research that have been used to develop BMPs for citrus production in Florida. Primary sources include the United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS), University of Florida/Institute of Food and Agricultural Sciences (IFAS), Environmental Protection Agency (EPA), Florida Department of Environmental Protection (FDEP), and Florida Department of Agriculture and Consumer Services (FDACS). This document cites pertinent documentation from these sources that may guide the implementation, evaluation, verification and validation of each BMP.

The proposed acquisition areas have been cultivated in citrus for approximately 30 to 35 years. The citrus growing areas are divided into four main parcels referred to as Alcoma, Devils Garden, Dunwody and Southern Gardens citrus groves. Each of these main parcels has an office, at least one maintenance shed and chemical storage room, and re-fueling area. Several diesel powered pump stations were identified throughout the properties. Citrus canker wash stations were observed at each of the entrances to the tracts. Personnel indicated that a copper containing solution was utilized in the spray. Agrochemical application was conducted using mobile equipment and chemical storage is onsite. Disposal of chemical containers is conducted offsite. Subject property personnel indicated there have been no central burn pits for removed trees and that trees were burned in many small areas across the site. An agricultural air strip is located on two of the parcels.

1.2 ENVIRONMENTAL SITE ASSESSMENT (ESA)

Phase I and Phase II Environmental Site Assessment (ESA) activities were conducted on the property in August and September 2008 by Professional Services Incorporated (PSI). Identified areas of potential point source concerns associated with the citrus operations are:

- Chemical Storage and/or Maintenance Areas
- Equipment Staging Areas
- Mix and Load Areas
- Fuel Storage / Re-fueling Areas
- Diesel Powered Pump Stations
- Canker Wash Stations
- Airplane Landing Strips

Section 2.0 provides descriptions of a variety of environmental BMPs to be considered as part of the citrus operations. Although all BMPs are important with the need for diligent on-going implementation, particular attention needs to be addressed to the following:

- Pump Stations
- Chemical Storage Areas
- Copper Based Nutrients

Given below is a summary of the observations made during the Phase I ESA, as well as the results of the Phase II ESA at the above referenced areas/issues and URS' recommendations to address the issues.

- Diesel powered pump stations with aboveground storage tanks (ASTs) used to store diesel fuel were observed on the properties. The pump stations are used to control to water in the groves. Soil staining and/or petroleum impacted soils were identified at most of the pump stations. **URS recommends implementing preventative measures for petroleum spills and diesel AST leaks. This should include repairing any leaks and use of absorbent material when leaks and/or spills occur. URS also recommends routine site inspections when the pumps are in operation to verify the pump stations are being properly maintained and in compliance.**

- Chemical and equipment storage areas were observed on the properties. Areas of petroleum and agrochemical stained soil and stressed vegetation were observed at the chemical and equipment storage areas. **URS recommends improving housekeeping at the storage areas. This should include proper handling and storage of agrochemicals and use of absorbent pads and materials at the equipment storage areas. URS also recommends monthly site inspections to verify the storage areas are being properly maintained.**

- During the Phase I ESA, PSI identified copper based nutrients from the USSC pesticide application records. Due to these copper based nutrients, PSI analyzed for copper in the citrus grove areas during the Phase II ESA. PSI divided the citrus cultivation area into 40-acre grids and

sampled approximately 50% of these 40-acre grids that were historically and currently cultivated with citrus. An eight point composite sample was collected from each grid with each aliquot representing approximately 5-acres. Additionally, discrete soil samples were collected throughout the citrus groves in each of the 5-acre grids. All aliquots were collected from a depth of 0 to 6-inches bls using a stainless steel sample barrel. The Phase II ESA sampling did not identify areas of elevated copper in the citrus groves above the Service provisional Snail Kite threshold level of 85 milligrams per kilogram (mg/kg). URS personnel reviewed the current rates of application and amounts of copper based nutrients applied on the USSC property. Utilizing this information, a mass balance equation was developed in order to evaluate if additional acreage would be impacted by copper based on the current application activities. URS has determined that no acreage would be affected by elevated levels of copper above the Service provisional 85 mg/kg. **Therefore the current agrochemical application regiment in the citrus groves is acceptable. URS recommends sampling select areas within the citrus groves every other year in order to monitor the copper concentrations in the soil. In the event that USSC plans to increase the applications rate of copper based agrochemical, URS recommends that USSC discuss the application increase with the District.**

1.3 OBJECTIVE

Given below are sets of guidelines proposed for the day-to-day citrus farming operations:

- Continued economically-viable citrus grove operations on the properties that is agreeable for implementation by the lessee/tenant during the interim use,
- Maintain/protect water quality in accordance with the State's water quality standards, prevent exceedances of applicable State soil and groundwater Cleanup Target Levels (CTLs) as set forth in Table 1 and 2 of 62-777, F.A.C., and implement such measures as necessary to maintain existing levels of pollutants and not interfere with Lessor's intent to use the premises as a future water resource project,
- Comply with State regulations that are applicable to the citrus grove operations that result in conditions that will maintain the soil and water quality at the site which will not prohibit the District from using the property as a water attenuation project area at the end of the interim use period.
- Comply with permits/consent agreements issued by the District approving the site specific BMP plan for Water Management, Nutrient Management and Fertilizing, and Erosion/Sediment Control and the Discharge Monitoring Plan for nutrients (phosphorus and nitrogen).

A list of agrochemicals currently used was provided to the District. The chemical usage list is included in *Section 6.0 Acceptable Agrochemicals and No Application Periods*. In the event that changes are made to the agrochemical list, a revised list should be provided to the District and should consist of a detailed specific agrochemical and pesticide product list, to include the quantity used, rates of application, and an evaluation of crop areas for effectiveness of the pesticides.

The U.S. Fish and Wildlife Service (Service) document titled "Derivation of No Application Periods for Interim Use Pesticides" defines the no application period as *the period of time prior to the conversion of the agricultural land to conservation purposes (i.e. flooding to create wetlands) during which a*

particular pesticide hazardous to fish and/or wildlife should not be applied, in order to allow adequate time for breakdown of pesticide residues before use of the land by the Service trust resources. This period of time was defined as five times the median half-life, representing 97% degradation. A copy of this document is included in **Appendix A**.

1.4 BMP CHECKLIST

A BMP Checklist has been developed for the citrus grove farming on the property owned by the District. The BMP Checklist is provided as a guide for site inspections, observations and verifications as part of the BMP. This checklist identifies areas, issues, and items requiring inspection and verification. The purpose of the BMP Checklist is to insure consistency for each site visit and for other sites with similar agricultural operations. A copy of the checklist is included in **Appendix B**.

The following table provides a quick-glance reference specific to nutrient (phosphorus and nitrogen) load reduction BMPs. As provided in Schedule 3.1, a separate District-approved BMP Plan is required for each land use or crop for nutrient load reduction. BMP Plans shall be implemented across the entire farm acreage (drainage area) with individual BMPs consistently implemented during the water year across each land use (crop) area. The BMP Plans shall include BMPS from each of the following categories: water management, nutrient control practices, and particulate matter and sediment controls. Nutrient control practices at a minimum shall include spill prevention, soil testing, and fertilizer application control. The Table below provides an array of nutrient load reduction BMPs available for selection by operators. However, operators may propose other BMPs, to meet the minimum required BMP equivalent points, for review and approval by the District.

Further discussion of each BMP and key points to assist with advance preparation of BMP site verification and BMP optimization efforts are provided in the following Sections.

Nutrient Load Reduction Best Management Practices
BMP Description and Equivalent Points Reference Table

BMP	PTS	DESCRIPTION
NUTRIENT CONTROL PRACTICES		MINIMIZES THE MOVEMENT OF NUTRIENTS OFF-SITE BY ENSURING RECOMMENDED APPLICATION RATES AND CONTROLLED PLACEMENT OF APPLICATION
Nutrient Application Control	2 ½	Uniform and controlled boundary application of nutrients with a minimum 4' setback from canals with no overlapping application for each application method (e.g. banding at the root zone or side-dressing, pneumatic controlled-edge application such as AIRMAX); fertilization through low volume irrigation system applied at root zone (fertigation); controlled placement by fertilization under plastic near root.
Nutrient Spill Prevention	2 ½	Formal spill prevention protocols (storage, handling, transfer, and education/instruction).
Manage Successive Vegetable Planting to Minimize P	2 ½	Avoid successive planting of vegetables or other crops having high P needs to avoid P build up in soils. Includes successive planting with no successive P application.

Recommended Nutrient Application based on Plant Tissue Analysis	2 ½ 5	Avoid excess application of P by determining plant nutrient requirements for adjustments during next growing season (crop specific). Pastures with Bahiagrass – Plant tissue analysis along with soil test is required to make nutrient application recommendation. Citrus– Additional points allowed for citrus because it provides information on current season P requirements.
Recommended Nutrient Application based on Soil Testing	5	Avoid excess nutrient application by determining P requirements of soil and follow standard recommendations for application rates (crop specific).
Split Nutrient Application	5	More efficient plant uptake of P by applying small portions of total recommended P at various times during the growing season. Not to exceed total recommendation based on soil test.
Slow Release P Fertilizer	5	Avoid flushing excess P from soil by using specially treated fertilizer that releases P to the plant over time.
Reduce P Fertilization	5	Reduce the P application rate by at least 30% below standard recommendations based on soil tests and development of site –specific (optimized) recommendations or application methods. Provide basis for reduction credit.
No Nutrients Imported Via Direct Land Application	20	No Application of P, in any form, to the soil for amendments or plant nutrients. (Native and Semi-improved Range can claim this BMP and still apply fertilizer at maintenance, or less than optimum production levels, as a grass supplement every 6-8 years.)
No Nutrients Imported Indirectly Through Cattle Feed	15	No P import to the basin through cattle feed (note: only native range can use mineral supplements or molasses and still meet this BMP)
Nutrient Management Plan	5 - 25	Managing the amount, source, placement, form, and timing of the application of nutrients on lands with cattle operations. See Rule 40E-63.402 (2)

BMP	PTS	DESCRIPTION
WATER MANAGEMENT PRACTICES		MINIMIZES THE QUANTITY OF OFF-SITE DISCHARGES WHICH CARRY NUTRIENTS DOWNSTREAM
½ Inch Detained 1 Inch Detained	5 10	Delayed discharge (based on measuring daily rain events using a rain gage).
Improvements to Water Management System Infrastructure to Further Increase Water Quality Treatment by Delayed or Minimized Discharge	5	Recirculation of water inside farm boundaries to improve WQ prior to off-site discharge, includes: fallow field flood water with no direct discharge (instead allow to "drain" via evapotranspiration, seepage, use as irrigation water); or Increasing water detention using properly constructed canal berms.
Low Volume Irrigation	5	Use of low volume irrigation methods, e.g. drip irrigation, microjet irrigation.
Approved and Operational Surface Water Reservoir (Fully Certified)*	20	Properly permitted, constructed and maintained storage system meeting specified Environmental Resource Permit (ERP) Basis of Review criteria (version in effect at the time of permitting or in effect at the time of permit modification for modified systems).
Temporary Holding Pond	15	Temporary agricultural activities (as described in Chapter 40E-400, FAC.) with a properly constructed and permitted temporary holding pond.
Overland Sheet Flow Over Entire Property	15	No drainage improvements made to property so that property drains through overland sheet flow, or drainage improvements such as ditches have been removed to restore overland sheet flow drainage to the property.
No Point Discharge of Surface Water	15	Voluntarily disabling of drainage or implementation of other permanent means to prevent point discharge.
Tailwater Recovery System	10	A planned irrigation system in which facilities have been installed and the system is operated to collect, store, and transport irrigation tailwater and/or rainfall runoff that would have been discharged offsite without the system.
Precision Irrigation Scheduling	10	Combination of soil-moisture measuring equipment, specialized irrigation decision tools (e.g. computer software), and/or remote sensing tools to ascertain real-time crop needs to maximize irrigation system performance and to develop precise irrigation scheduling (time, location and amount).

**Surface water reservoir certification refers to a construction completion certification by a Florida licensed Professional Engineer as required in Chapter 40E-4, F.A.C., using Form 0881A for projects permitted after October 3, 1995, and Form 0881B for projects permitted prior to October 3, 1995, or the current certification requirements of Chapter 40E-4, F.A.C. (except where not required by existing permits).

BMP	PTS	DESCRIPTION
PARTICULATE MATTER AND SEDIMENT CONTROLS		MINIMIZES THE MOVEMENT OF P, IN PARTICULATE MATTER AND SEDIMENTS, OFF-SITE BY CONTROLLING THE AMOUNT OF ERODED SOIL AND PLANT MATTER IN DISCHARGE
Any 2 Any 4 Any 6 Any 8	2 ½ 5 10 15	• erosion control by leveling fields • reduce soil erosion using grassed swales and field ditch connections to laterals • minimize sediment transport with slow velocity in main canal near discharge structure • minimize sediment transport into canals by constructing ditch bank berms • minimize sediment build-up through a canal cleaning program • reduce sediments transported offsite by using field ditch drainage sumps • minimize sediment transport with slow field ditch drainage near pumps/structure • reduce sediments transported offsite by maintaining a sediment sump/trap upstream of drainage structure • reduce sediment transport through the use of grassed waterways • reduce sediment transport through the use of filter strips or riparian buffers adjacent to waterways. No P is applied to these areas. • reduce sediments transported offsite by raising culvert bottoms above all ditch bottoms to minimize sediment transport • reduce sediments transported offsite by stabilizing soil through infrastructure improvements at canal/ditch intersections (e.g. flexible plastic pipe, polymer treatment) • maintain sustainable forage growth on pasture to reduce soil erosion/range seedings • reduce soil erosion with constructed ditch bank stabilization • reduce soil erosion with cover crops (not fertilized) • maintain vegetative cover in upland areas to reduce soil erosion • reduce soil erosion with vegetation on ditch banks • minimize P from plants by aquatic weed control (P source) at main discharge locations • reduce debris and aquatic plants (P source) leaving the site by using barriers at discharge locations

BMP	PTS	DESCRIPTION
PARTICULATE MATTER AND SEDIMENT CONTROLS FOR PASTURE MANAGEMENT		MINIMIZES NUTRIENTS IN DISCHARGES THROUGH ON SITE OPERATION AND MANAGEMENT PRACTICES
	2 ½	• restricted placement of stored feed and feeders to reduce "hot spots" near drainage ditches
	2 ½	• restricted placement of cowpens to reduce "hot spots" near drainage ditches
	2 ½	• restricted placement of water to reduce "hot spots" near drainage ditches
	2 ½	• provide shade structures to prevent cattle in waterways
	5	• low cattle density (1 head/2 acres, nonirrigated pasture)
	10	• restrict cattle from waterways through fencing of canals in a manner that protects water quality

2.0 WATER RESOURCE MANAGEMENT

The drainage systems that have been developed in the USSC property to make productive agricultural and urban land have increased drainage frequency, discharge volumes, and the velocity of water discharged from structures within the watershed compared with the natural condition. An existing permit, issued by the District, for the USSC property drainage systems is currently in place. Excess rainfall from high intensity thunderstorms, tropical storms, and hurricanes must be drained to protect agricultural and urban areas from flooding. Under natural conditions, water from these areas would be cleaned by traveling downstream via tributaries before reaching coastal water bodies. Implementation of the practices and policies in this Section will improve water quality and maintain natural variability and the aquatic ecosystems in the USSC citrus production property.

Wherever feasible, citrus growers will implement surface water management strategies consistent with the surface water management or ERP permits. These surface water management strategies should also consider benefits from improved ditch maintenance and water table management. It is important to conduct site-specific evaluations to evaluate if additional measures can be provided on-site and to plan long-term water management strategies that will minimize off-site discharges.

2. 1 WATER TABLE MANAGEMENT

The water table can be managed more efficiently by having sufficient hydraulic capacity in the ditch/canal system, using water control structures on culverts, laser land leveling where appropriate, constructing and maintaining a properly designed drainage system, and actively monitoring the water table. Based on the Phase II ESA, the existing system is satisfactory and is consistent with the District's goals and objectives.

Effective water management of flatwoods soils requires monitoring the water table depth with enough precision to minimize pumping for irrigation and drainage. Knowledge of the water table depth is essential to ensure that adequate drainage can be provided. Since a significant portion of the tree water requirements can come from upward flux from the water table, water table monitoring is an essential tool in irrigation management. Water table manipulation, and associated supplemental irrigation reductions, can also assist in salinity management by reducing the use of low quality groundwater.

2. 2 SCHEDULING IRRIGATION AND DRAINAGE

The main management objective is to minimize the overdrainage of the property by the active control of the site water table. Irrigation mostly affects the movement of water-soluble chemicals while drainage mostly affects the movement of chemicals absorbed to soil particles. Irrigation at the properties principally consists of microjet irrigation. The microjet system on the property is effectively operating and is acceptable by the District. Site verification will include discussion and BMP-related records review with operation managers to understand property water management approach and visual observation of structures and tools used to assist with water management decisions.

Operation managers should use real-time weather monitoring to proactively manage or limit drainage and/or irrigation events. Effective water management is achieved through water control structures such as designed culvert sizes and openings or culverts with flashboard risers. Control elevations will be established to initiate and stop draining or pumping. If feasible, the operation manager will partition the

property into hydrologic blocks to allow for internal water management as opposed to one location at a downstream point. Water level indicators (e.g., floats, staff gages) will be used to provide a visual indicator of actual water table levels for use in optimizing water management (drainage and irrigation) practices. Where reservoirs do not exist, daily operation and maintenance of off site discharge structures must be properly recorded on field logs ensuring that established control elevations are met. Field log data shall include recording the water table elevations during pump start-up and shut-down times, and pump rpms as applicable.

Soil moisture measurements should be recorded to determine optimum times for irrigation and irrigation limits. The properties are currently utilizing the Agrolink system that uses soil monitoring probes to measure the soil moisture at various depths down to 36-inches below land surface.

2. 3 MODERATE DISCHARGE RATE

Adjust the rate of discharge proportionate to the rate of lateral movement of water through soils. Slowing the discharge rate will lessen the turbulence, reduce sediment movement, reduce erosion, and moderate the impacts on the receiving water body.

2. 4 WATER FURROW MAINTENANCE

Maintain a consistent bottom slope on water furrows between beds to achieve uniform drainage. Avoid rutting and sloughing of water furrow areas. Laser or RTK-GPS guided systems on water furrow maintenance equipment can be very effective in producing uniform slopes in water furrows. Where possible, maintain vegetation management programs that minimize soil movement in the event of heavy rains by keeping a grass or vegetation cover on the soil surface in between tree rows. For additional information refer to the Erosion Control and Sediment Management Section in this document.

2. 5 MONITOR SOIL MOISTURE

The Agrolink system for soil moisture measurements is used in conjunction with water table observation wells and staff gauges in the canals for irrigation and drainage management to avoid excess soil moisture depletion and minimize water volume requirements during irrigation cycles. This system of soil monitoring is appropriate and acceptable by the District.

2. 6 DRAINAGE MANAGEMENT PLAN

Implement and maintain a written drainage management plan that provides specific responses to various types and levels of rainfall. The goal of the plan is a reduction in volume of off-site discharge while maintaining a healthy rooting environment for citrus trees thus maximizing fruit production. The plan will include target water table levels and pump or drainage structure operating procedures that will be used for typical and extreme rainfall events. Consideration should be given to the use of existing canals and ditches for temporary water storage.

2. 7 DRAINAGE RATE AND VOLUME

Drainage rates and the volume of water released or discharged following intense rainfall events should provide an adequately drained root zone while minimizing off-site impacts. The system operating the drainage rates and volumes will be in compliance with existing drainage permits.

When the water table approaches the target level, off-site discharges should be moderated. Depending on the grove design, irrigation method (e. g. microirrigation and seepage irrigation), and soil characteristics, this may require adjusting pump speed and the discharge structure or pulse drainage. Pulse drainage involves discharging for short periods of time and then allowing for recharge in the ditches. If adequate drainage in one portion of a grove results in water tables that are below target levels in another area, ditch cleaning, drain-age system redesign, or auxiliary pumps may be needed to achieve more uniform drainage.

2. 8 DISCHARGE STRUCTURES

Structures and/or pumps that regulate off-site water discharge should be adequately designed, constructed, and maintained so that target water table levels within the grove can be achieved.

If safety or operational concerns prevent structures from being adjusted to regulate discharges during storm drainage events, they should be rehabilitated or replaced. (e.g. modifying riser-board structures to allow easier water level control). For additional information see your local NRCS and District representative.

2. 9 DETENTION, TAILWATER RECOVERY, AND SURFACE WATER USES

Where possible, on-site detention should be utilized to reduce both the rate and volume of off-site discharges.

Detention areas allow all or a portion of the drainage water to be temporarily stored on-site. The excess water can be stored for tailwater recovery or released later at low flow rates. The size, type, and location of proposed tailwater recovery ponds are variables considered when determining the need for an Environmental Resource Permit. Growers should contact their local District office and land manager for guidance on the issue. Most of the citrus groves in the USSC properties have permitted stormwater impoundments.

If a tailwater recovery program is proposed, the planning, construction, evaluation of costs, and permitting will need to be discussed and reviewed by the District.

The properties are all in compliance with Section 2.1 through 2.9 with the exception of Section 2.6 – Drainage Management Plan. It is URS' understanding that USSC is in the process of developing a written Drainage Management Plan for the citrus properties.

3.0 EROSION CONTROL AND SEDIMENT MANAGEMENT

Sediments or suspended solids are recognized forms of water pollution and often result in the loss of ditch or canal capacity. Unlike many chemical pollutants, sediment is a natural component of water bodies and the resources they support. Excessive amounts of suspended solids or sediments are often a product of erosion from unstabilized or disturbed land areas. These solids originate from four primary sources:

- Soil-particles eroded into ditches
- Soil-particles eroded from ditches
- Plant material washed into the ditches
- Plant and biological material growing within the ditches and canals.

Excessive sediments deposited on stream bottoms and suspended in the water column can harm fish spawning and impair fish food sources, reduce habitat complexity, potentially harm public water supply sources, and reduce water clarity.

In addition to potential downstream water quality impacts, the build-up of silts and sediments in the grove/farm-level, secondary, and primary drainage canals reduces ditch and canal cross-section. This reduction in cross-sectional area results in higher water velocities, as compared to an unfilled ditch or canal. This higher water velocity (compared to unfilled ditches/canals) may induce greater amounts of erosion of fine and coarse particles from ditch and canal banks. The presence of shoals and sandbars are good indicators of soil losses. Field erosion also results in site degradation resulting in increased costs for ditch-cleaning and reshaping of beds and furrows. In order to minimize effects of sediment transport in surface water, efforts should focus on keeping soils in the fields and along canal and ditch banks.

Minimizing downstream transport of sediments from groves and canal/ditch banks requires an integrated approach of managing erosion at the grove-level, the secondary canal system level and primary canal system level. It should be noted that maximum sediment losses from groves are expected during construction of new groves or renovation of older ones. Losses from mature, well managed groves will be much lower. The following Sections describe BMPs that are applicable for water conveyances within citrus groves. The selection and implementation of particular BMPs must be based upon site-specific circumstances and management styles.

3.1 RISER-BOARD WATER CONTROL STRUCTURES

Water discharge structures are used to control water table levels and surface water levels in drainage ditches within flatwoods citrus groves. The type of structure selected can significantly influence the quality of water discharges. With riser-board control structures, water is forced to flow over the top of the boards. This flow path creates a low current area towards the bottom of the structure, which facilitates the deposition of sediments and their accompanying nutrients or pesticides, essentially removing them from the discharges. Conversely, screw-gates structures do not create this dead-current zone. Since they open from the bottom, sediments and their accompanying load are swept out along with the discharge water.

3.2 SEDIMENT SETTLING BASINS

Create and maintain localized settling basins (sumps) throughout the groves to trap sediments prior to water discharge points from the grove where practical. Successful sediment traps require site-specific designs, with the following requirements:

- Determine runoff volume and intensity.
- Determine transport and settling rates for sediments of concern.
- Size traps to allow adequate residence time for natural settling to occur - include considerations for allowable storage (fill-up) of trapped sediments.
- Make provisions for materials removed from the ditches so that it does not create a situation that contributes to nutrient loads discharged off site.
- Maintenance access to settling basin area should be provided.
- When sediments are removed, materials need to be placed in a manner that prevents material from sloughing back into the waterway.
- Sediment excavation and removal should be conducted during low stage conditions or during the dry season. This will reduce the likelihood of increasing turbidity and suspended solid loads.

Settling basins or settling ponds are a quick and simple way to remove sediments out of runoff water. Settling basins simply slow down the water, allowing sediments to settle out of the water before the water returns to the receiving water body.

NOTE: Existing detention impoundments may function as sediment settling basins.

Currently, the Devils Garden, Southern Gardens, and Dunwody citrus groves each have a series of sediment settling basins. At these properties, each block in the groves contains a ditch that flows to lateral canals and then to a specific retention pond, depending upon the location on the property. The retention ponds then operate as a series of sumps that allow for the sediment to settle to the bottom of the retention ponds. After adequate residence time occurs, the water from the retention ponds flows to a discharge pond where it is discharged off the property. The Southern Gardens and Dunwody groves each have one discharge pond while the Devils Garden grove contains three discharge ponds. The Alcoma Citrus does not contain retention ponds but rather a canal system that allows for adequate residence time for natural settling prior to being discharged from the property.

3.3 DITCH CONSTRUCTION

Construct ditches and canals with side-slopes consistent with soil types.

3.4 STABILIZE BARE SOILS

Stabilize bare soils and canal or ditch banks by encouraging coverage by noninvasive vegetation. Vegetation types selected should be adapted to grove conditions and should provide maximum stabilization by roots and foliage. Vegetative buffer strips can also serve to reduce the erosion of soil particles. Whenever practical, plant or encourage establishment of native species.

3.5 DITCH BANK CONTOURS

Contour ditch bank top edges or berms to divert water away from the drainage ditch.

This practice will minimize overland flow of storm-water directly down the banks.

3.6 DITCH BANK VEGETATION MAINTENANCE

Broadleaf weed control using herbicides or maintenance mowing of slopes and ditch banks increases grass cover and decreases the proliferation of shade-producing shrubs and weeds, thus reducing erosion from wind and rainfall.

Points to Consider:

- Mechanical mowing does not uproot vegetation and expose soil.
- The use of herbicides shall be conducted with caution and precision to avoid creating areas of bare soil.
- Selective herbicides should be used in order to maintain desired vegetation (e.g. remove broad-leaf vegetation while maintaining grasses).

3.7 PROTECT DITCH BANKS

Protect canal and ditch banks from erosion in areas subject to high water velocities.

In areas where water is constricted (usually at discharge points) or at ditch intersections where velocities are high, rip-rap, concrete, headwalls, or other materials that buffer turbulence should be used to protect ditch banks and reduce sediment transport.

3.8 VEGETATIVE STABILIZATION (WATER FURROWS)

Plant non-invasive vegetation and/or maintain desirable vegetation within all water furrows to prevent/minimize erosion and trap sediments that may result from stormwater runoff or irrigation drainage.

3.9 AQUATIC PLANT MANAGEMENT

When removing vegetation from ditch bottoms, avoid disrupting side slopes.

If a backhoe without a vented bucket is used to remove aquatic plants from grove ditches, special precautions must be taken to prevent washouts. Once a bucketful of vegetation is picked up, the bucket should be raised to allow most of the water to drain out over the deeper part of the ditch. The boom should be swung far enough over the ditch bank so that when the vegetation is dumped, remaining water will flow away from the ditch.

Note that chemical control of mature aquatic vegetation may result in large amounts of labile particulate phosphorus levels from farms. Timing and selection of methods for aquatic vegetation control shall prevent generation of particulate phosphorus due to inappropriate aquatic vegetation control methods and disposal. Glyphosate based herbicide Rodeo may be spot applied on the aquatic vegetation, followed by removal of the dead vegetation. Excessive amounts of Rodeo application are not allowed.

3.10 DITCH MAINTENANCE CLEANING AND DREDGING

Develop and implement a systematic management plan for removing sediments from canals and farm ditches on a regular basis.

Maintenance dredging of existing ditches, canals, and intake and discharge structures shall include the following:

- Spoil material should be removed and deposited on an area that will prevent the movement of the water and excavated spoil material into wetlands or other surface waters.
- Do not remove any more material than is necessary to restore the original design specifications or configurations.
- No significant impacts should occur to previously undisturbed natural areas.
- Erosion and sedimentation control devices (e.g., turbidity screens) should be used to prevent bank erosion, scouring, and to prevent turbidity from discharging into adjacent waters during maintenance dredging.

Removal of excess sediment to the originally designed and constructed cross-sectional area generally increases the canal cross-sectional area and reduces water velocities (compared to same water volume in filled-in systems), thus reducing the potential for bank scouring. Caution should be considered as ditch maintenance, cleaning and dredging beyond the originally designed and constructed cross-sectional area may result in upstream and/or downstream adverse water resource impacts. Routine maintenance of the canals are, in general, conducted on a yearly basis.

If not part of standard ditch/canal maintenance, prior to conducting non-routine maintenance, in order to reduce the potential for misunderstandings with regulatory agencies and adjacent property owners, growers are highly encouraged to initially schedule a site visit with a local District representative to discuss and review the non-routine ditch maintenance activities.

3.11 HERICIDE APPLICATIONS (WATER FURROWS)

Restrict the area of tree-row applied herbicides to within the canopy dripline of the citrus trees.

The restricted herbicide band width will maximize the width of grassed water furrow slopes. Grassed water furrows serve as filters, preventing sediment movement from the fields into the drainage systems.

For young plantings, minimize the width of tree-row applied herbicides and establish vegetation in the water furrows. Smaller band widths will reduce the quantity of herbicides applied, thereby reducing material costs while minimizing potential of soil erosion into the drainage systems. As the trees increase in canopy width, the herbicide band width can be increased to match canopy size.

3.12 MIDDLES MANAGEMENT (HERBICIDE)

Suppress undesirable vegetation on bed tops and in water furrows.

3.13 GROVE DEVELOPMENT/RENOVATION

Upon completion of the soil bedding process within citrus groves, all bare soil areas (except tree rows) should be planted with grass or other vegetation species to minimize soil movement from rain and/or wind.

Bare soil surface, during windy conditions, can provide sufficient soil to blast the bark of young trees and allow movement of soil into water furrows and other drainage systems.

3.14 WATER FURROW DRAIN PIPES

Use PVC drain pipe or flexible pipe to connect all water furrows or field ditches to lateral ditches. Extend the pipe on the downstream side away from the ditch bank to prevent bank scouring.

3.15 WATER FURROW MAINTENANCE

Use water furrow drain pipes with managed vegetation in furrows to reduce surface water transfer velocity from the furrows to the drainage ditches and canals.

3.16 CONSTRUCTION AND TEMPORARY EROSION CONTROL MEASURES

In the event that large-scale, non-routine construction is required, then special measures and/or temporary erosion control measures will be taken during construction and renovation of groves, when culverts and control structures are replaced or repaired, and when there is a major disruption of established vegetation such as during irrigation system installation or when buried water lines are repaired.

Erosion control measures are used to minimize sediment transport and protect the quality of water bodies that receive runoff from disturbed areas. The most common temporary erosion control tools include straw or hay bale barriers, silt screens, and silt fences; however, more permanent control can be obtained through the use of specialized blankets and mats, gabions, and other systems used for soil stabilization.

The cost of erosion control options are highly variable and agricultural producers are encouraged to consider economics and site-specific conditions when selecting the most appropriate erosion control system for a particular action. When selecting an erosion and sediment control method, it is recommended that a NRCS representative, engineer, and/or a District Ag-Team member be consulted. This current erosion control on the property is appropriate and acceptable by the District.

4.0 PEST MANAGEMENT

Over the last 20 years, great strides have been made in the development of crop protection (CP) products that are more target specific, less harmful to the environment and safer to those who handle and apply these products. The development and implementation of responsible farm management practices that promote the proper handling of these products also has contributed significantly to reducing the risk of environmental problems and protecting water resources, pesticide handlers and agricultural workers.

4.1 INTEGRATED PEST MANAGEMENT (IPM)

Adopt an Integrated Pest Management (IPM) program. IPM is an integrated system using a combination of mechanical, cultural, biological, and chemical approaches to best meet the goals of the program. This approach provides better and more economical management of most pests.

IPM is a philosophy of managing pests that aims to reduce farm expenses, conserve energy, and protect the environment. IPM is a broad, interdisciplinary approach using a variety of methods to systematically manage pests which adversely affect people and agriculture. IPM does not, as many believe, mean that no CP products are used. Rather, it means that CP products are only one weapon against pests and they should be used judiciously, and only when necessary.

The goals of an IPM program are:

1. Improved control of pests, through a broad spectrum of practices that work together to keep pest populations below economically significant thresholds.
2. More efficient CP product management through less frequent and more selective use of CP products.
3. More economical crop protection from reduced chemical costs and more efficient protection.
4. Reduction of potential hazards to farmers, workers, consumers, and the environment through reduced CP product exposure.

IPM accomplishes these goals using resistant plant varieties, cultural practices, parasites and predators, other biological controls such as *Bacillus thuringiensis* (BT), and other methods including chemical CP products as appropriate.

The basic steps for an IPM program are:

1. Identify key pests and beneficial organisms and the factors affecting their populations.
2. Select preventative cultural practices to minimize pests and enhance biological controls. These practices may include soil preparation, resistant rootstocks/scions, modified irrigation methods, cover crops, augmenting beneficials, etc.
3. Use trained "scouts" to monitor pest populations to determine if or when a control tactic might be needed.
4. Predict economic losses and risks so that the cost of various treatments can be compared to the potential losses to be incurred.
5. Decide the best course and carry out corrective actions.

6. Continue to monitor pest populations to evaluate results and the effectiveness of corrective actions. Use this information when making similar decisions in the future.

USSC currently has an IPM program in place and the policy has been implemented.

4.2 LABEL IS THE LAW

Read and understand the CP product label. The label is the law. Pay special attention to the "Environmental Hazards" section of the label. This applies to all sections following.

4.3 PRODUCT SELECTION

Select target-specific active ingredients that consider natural systems in epidemiological cycles and modes of action (i.e. insect growth regulators, botanicals, and biologicals).

Agricultural use of CP products should be part of an overall pest management strategy, which includes biological controls, cultural controls, pest monitoring and other applicable practices, referred to altogether as Integrated Pest Management or IPM. When a CP product is needed, its selection should be based on effectiveness, toxicity to non-target species, cost, and site characteristics, as well as its solubility and persistence.

While the focus of the IPM program is for field populations of mites, insects, nematodes, disease pathogens and weeds, CP products also are prescribed for post-harvest maintenance of fruit quality. Some of these situations require pre-harvest applications as part of the overall management strategy. Due consideration needs to be given to these treatments in the overall crop BMPs.

4.4 MINIMIZE SPRAY DRIFT

Reduce the potential for drift through appropriate selection of nozzles, spray pressure, and application methods or techniques for the formulation applied and equipment used. Always follow the label.

- Use nozzles that produce as large of a droplet size as possible while yielding adequate plant coverage and pest control.
- Leave a buffer zone according to the crop protection label between the treated field and any sensitive areas.
- Drift control agents can be tank-mixed with herbicides to reduce spray drift.

4.5 APPLICATION TIMING

Time CP product applications in relation to current soil moisture, anticipated weather conditions, and irrigation schedule to achieve greatest efficiency.

For weather information:

Florida Automated Weather Network: http://fawn.ifas.ufl.edu/

National Oceanic and Atmospheric Administration: www.NOAA.gov

National Oceanic and Atmospheric Administration: http://weather.noaa.gov/

The Weather Channel: www.weather.com

4.6 PRECISION APPLICATION OF CP PRODUCTS

Use precision applications of reduced amounts of material to smaller trees in order to minimize application of CP products to non-target areas and result in more efficient utilization of applied materials. The method of CP product application, such as ground or aerial spraying, wicking, granules, etc., is important since the degree of drift and volatilization can vary considerably.

Some "intelligent" spraying systems are equipped with three-dimensional range sensors that can map the image of a tree up to 100 ft away on either side of the sprayer. These sensors feed the size, height, and location of the tree into an on-board computer that then turns on spray nozzles inches before the sprayer reaches the tree and turns them off inches past the tree. The nozzles are controlled by electric solenoid valves, which are set up in zones so that only the foliage detected by the scanner is sprayed.

It is important that "intelligent" systems be properly maintained and operated and that equipment operators are trained in their use. Proper operation of "intelligent" systems is essential for efficient use of CP products.

Equipment without intelligent systems should have nozzle arrangements to avoid overspray based on tree height. This is sometimes referred to as "nozzling-down" to conserve spray materials and ensure application to target areas.

Other systems have been developed that utilize sonar for detecting foliage. These systems utilize ultrasonic impulses to detect the presence or absence of trees and plants. Sensors are installed on each side of the sprayer that may be aimed in any desired direction to cover optimal zones. The number of sensors can vary depending on the diversity of tree sizes within the grove.

Regardless of application system, proper training of applicators and maintenance of spray systems are essential to good management.

4.7 MAINTENANCE AND CALIBRATION

Proper calibration and maintenance of CP product application equipment are essential for the proper application of agricultural chemicals. Equipment without "intelligent" systems should be manually nozzled down or otherwise adjusted when necessary to ensure proper application rates.

Calibration is the process of measuring and adjusting equipment performance. Application equipment that must be calibrated includes granule-applying devices; hand, backpack, boom, air-blast and other sprayers; soil fumigation devices; and injection equipment used for chemigation work. Calibration is not difficult. Calibration requires some arithmetic. Consult IFAS publication SM-53 or other publications for details and examples of calibration calculations.

CP product application equipment can deliver the correct amount of CP product to the target site only if it is working correctly. Before you start to calibrate any equipment, first make sure that all components are clean and in good working order.

To accurately calibrate any device, you must be familiar with the machinery. Follow the manufacturer's directions carefully – they usually explain how to adjust the equipment. Pay particular attention to the parts (such as nozzles and hopper openings) that regulate how much CP product is released. If these parts are clogged, not enough product will be released. If they are worn, too much product will be released.

Keep application equipment properly calibrated and in good repair. Correct measurement will keep you in compliance with the label, reduce risks to applicators, farm workers, and the environment, and save you money. Calibrate using clean water and do not calibrate equipment near wells, sinkholes, or surface water bodies. Measure CP products and diltuents accurately to avoid improper dosing, preparation of excess or insufficient mixture, or preparing a tank-load of mixture at the wrong strength.

Proper application of CP products will help reduce farm costs. Improper application can result in wasted chemicals, marginal pest control, excessive carry-over or crop damage. As a result, inaccurate application is usually very expensive.

4.8 RECORD KEEPING

The Florida pesticide law requires certified applicators to keep records of all restricted use pesticides (RUP). The federal Worker Protection Standard (WPS) requires employers to post information for employees of all pesticides applied. Maintain accurate CP product records to meet legal responsibilities and to document production methods.

CP product record-keeping requires you to have current knowledge concerning the application of CP product materials within your area of influence. In addition, Florida law requires that you record the following items to comply with the RUP record-keeping requirement:

- Brand or product name
- EPA registration number
- Total amount applied
- Location of application site
- Size of area treated
- Crop / variety / target site
- Month / day / year of application
- Name and license number of applicator (If applicator is not licensed, record his/her name and the supervisor's name and license number.)
- Method of application
- Name of person authorizing the application, if the licensed applicator does not own or lease the property

Florida regulations require that information on RUPs be recorded within two working days of the application and be maintained for two years from the application date (Chapter 487.2051 Florida Statutes). The Worker Protection Standard (WPS) requires information on all CP products to be recorded and posted when a CP product is about to be applied or has recently been applied. WPS requires that records be made available for 30 days after an expired Restricted Entry Interval (REI).Required records must be made available upon request to FDACS representatives, USDA authorized representatives, and licensed health care professionals.

4.9 PROTECT WATER SOURCES DURING MIXING

Protect your water source by keeping the water pipe or hose well above the level of the CP product mixture. This prevents contamination of the hose and keeps CP products from back-siphoning into the water source. If you are pumping water directly from the source into a tank, use a check valve, anti-siphoning device or backflow preventer to prevent back-siphoning if the pump fails.

4.10 SPILL MANAGEMENT

Potential for movement of spilled CP products in water is reduced if the spill is controlled, contained, and cleaned up quickly. Establish a plan for action.

Clean up spills as soon as possible. The sooner you can contain, absorb, and dispose of a spill, the less chance there is that it will cause harm. Always use the appropriate PPE as indicated on the MSDS and the label. In addition, consider the following four steps:

- CONTROL actively spilling or leaking materials by setting the container upright, plugging leak(s), or shutting the valve.
- CONTAIN the spilled material using barriers and absorbent material.
- COLLECT spilled material, absorbents, and leaking containers and place them in a secure and properly labeled container.
- Store the CONTAINERS of spilled material until they can be applied as a CP product or appropriately disposed.

Small liquid spills may be cleaned up by using an absorbent such as cat litter, diluting with soil, and then applying the absorbent to the crop as a CP product in accordance with the label instructions.

Farmers, farm managers, and landowners must comply with all applicable federal, state, and local regulations regarding spill response training for employees, spill-reporting requirements, spill containment, and cleanup. Keep spill cleanup equipment readily available when handling CP products or their containers.

If a spill involves a CP product covered by certain state (Chapter 376.30702 Florida Statutes and Chapter 62-150 Florida Administrative Code) and federal laws (Public Law 965 10 and Public Law 925000 - CERCLA), you may need to report any accidental release if the spill quantity exceeds the "reportable quantity" of the active ingredient specified

4.11 PERMANENT MIX-LOAD SITES

USSC currently uses one permanent mix-load station at the Dunwody Grove to reduce CP product spillage. A well-designed permanent mix/load facility is convenient and provides a place where spill-prone activities can be performed over an impermeable surface that can be easily cleaned. This permanent mix-load station meets IFAS guidelines.

To minimize the risk of CP products accumulating in the environment from repetitive spills, you may wish to construct a permanent mix/load facility with an impermeable surface (such as sealed concrete) so that spills can be collected and managed.

A permanently located mixing and loading facility, or chemical mixing center (CMC), is designed to provide a place where spill-prone activities can be performed over an impermeable surface that can be easily cleaned, and permits the recovery of spilled materials.

Locate CP product-loading stations away from groundwater wells and areas where runoff may carry spilled CP products into surface water bodies. If such areas cannot be avoided, protect wells by properly casing and capping them, and use berms to keep spills out of surface waters.

It is crucial that a CMC facility be properly designed and constructed. Several publications are available to explain design, construction and operational guidelines for permanent mix/load facilities. These publications are listed in the reference section.

Do not build new facilities on potentially contaminated sites, since subsequent cleanup efforts may require the operation to be relocated.

4.12 PORTABLE MIX LOAD SITES

USSC currently uses portable mix load stations to reduce CP product spillage over a prolonged period of time. CP product loading areas should be conducted at random locations in the field with the aid of nurse tanks.

Another option for preventing contamination of mixing and loading sites is to use a portable mixing pad. Some are a little more than a pad of very durable material, while others are made of interlocking steel sections with a custom-fitted liner and built-in sump.

Portable mixing centers usually have no roof, but should be protected from rain. Since the pad may contain CP product residues, the accumulated rain water may need to be applied as a CP product or disposed of as hazardous waste. A heavy rain can cause the pad to overflow, washing CP products into the environment. A sudden thunderstorm can result in a considerable amount of contaminated runoff, or even a spill. Clean portable mixing centers thoroughly immediately after a spill, because the liner material could be damaged by the CP product formulation. Where practical, portable pads for mixing and loading should be used away from wells or surface water. Never leave a tank unattended while filling.

URS has reviewed the USSC portable mix load operations, and the system is in compliance with IFAS.

4.13 UTILIZE NURSE TANKS FOR RANDOM FIELD MIXING

CP product loading areas should be conducted at random locations in the field with the aid of nurse tanks.

Nurse tanks are tanks of clean water transported to the field to fill the sprayer. Nurse tanks make it possible to move the mixing and loading operation away from permanent sites to random locations in the field. Mixing chemicals at random sites in the field lessens the chance of a buildup of spilled materials in one place.

One variation is a self-contained mix/load trailer with a nurse tank at one end and a mix/load area at the other, where the mixture is pumped directly into the sprayer. Another use is portable containment facilities with nurse tanks to set up a temporary mixing/loading site in a remote field, or on leased land where no permanent structure is practical.

4.14 EXCESS MIXTURE

Mix only the amount of CP products needed during an application period.

It is not always possible to avoid generating excess spray material. The appropriate practices to be followed depend on the type of CP product waste. If there is excess CP product material, use it in accordance with the label instructions.

4.15 CONTAINER MANAGEMENT

Develop and implement procedures to appropriately rinse and dispose of, or recycle agricultural chemical containers. .

- No bags, boxes and group I pesticide containers may be burned on-site.

Try to avoid the need to dispose of CP product containers as wastes by:

- Using containers that are designed to be refilled by the CP product dealer or the chemical company
- Arranging to have the empty containers recycled or reconditioned
- Using soluble packaging when available

When disposal is needed, rinse CP product containers as soon as they are empty. Pressure rinse or triple rinse containers and add the rinse water to the sprayer. Shake or tap non-rinseable containers such as bags or boxes so that all dust and material falls into the application equipment. Always wear the proper personal protective equipment (PPE) when conducting these rinse operations.

After cleaning, puncture the CP product containers to prevent re-use (except glass and refillable mini-bulk containers). Keep the rinsed containers in a clean area, out of the weather, for disposal or recycling. Storing the containers in large plastic bags is one option to protect the containers from collecting rainwater.

Recycle rinsed containers in counties where an applicable program is available, or take them to a landfill for disposal. Check with your local landfill before taking containers for disposal, as not all landfills will accept them.

For information about CP product container recycling programs in your area, contact The University of Florida Pesticide Information Office 352-392-4721

4.16 EQUIPMENT SANITATION AND WASH WATER HANDLING

Wash-water from CP product application equipment must be managed properly since it may contain CP product residues. If permanent wash stations are not used, excess mixture needs to be properly disposed of or re-used.

- Wash the outside of equipment at random places in the field to avoid chemical build up at a site.
- Avoid washing contaminated equipment in the vicinity of wells or surface water bodies. Dispose of rinse water according to label instructions.
- If permanent wash stations are used, wash water should be reused or properly disposed.

4.17 STORAGE

Design and build CP product storage structures to keep CP products secure and isolated from the surrounding environment. Store CP products in a roofed concrete or metal structure with a lockable door. Locate this building at least 50 feet from other structures (to allow fire department access) and 100 feet from surface water and from direct links to ground water. Keep CP products in a separate facility, or at least in a locked area separate from areas used to store other materials, especially fertilizers, feed, and seed.

Do not store CP products near burning materials, hot work (welding, grinding), or in shop areas. Avoid storage of CP products in spaces occupied by people or animals. Do not allow smoking in CP product storage areas.

Store PPE where it is easily accessible in the event of an emergency, but not in the CP product storage area to avoid contamination and since that may make PPE unavailable in time of emergency. Check the label and the MSDS for the safety equipment requirements. Keep a written CP product inventory and the MSDS file for the chemicals used in the operation on site. Do not store this information in the CP product storage room.

Depending on the products stored and the quantity, you may need to register the facility with the Department of Community Affairs and your local emergency response agency. Check with your CP supplier about Community Right-to-Know laws for the materials that you purchase. An emergency response plan should be in place. Emergency response phone numbers are provided in **Appendix C**. All farm personnel should be familiar with the plan before an emergency occurs. Individuals conducting emergency CP product cleanups should be properly trained under the requirements of the Occupational Safety and Health Administration (OSHA).

Do not store large quantities of CP products for long periods of time. Adopt the "first in - first out" principle, using the oldest products first to ensure that the product shelf life does not expire.

Store CP products in their original containers. Do not put CP products in containers that might cause children and others to mistake them for food or drink. Keep the containers securely closed and inspect them regularly for splits, tears, breaks, or leaks. Arrange CP product containers so that labels are clearly visible and legible.

All CP product containers should be labeled. Refasten all loose labeling. Use non-water-soluble glue or sturdy transparent packaging tape to refasten loose labels. Do not refasten labels with rubber bands (these quickly rot and break) or non-transparent tapes such as duct tape or masking tape (these may obscure important product caution statements or label directions for product usage). If a label is damaged, immediately request a replacement from the CP product dealer or formulator. As a temporary supplement to disfigured or badly dam-aged labels, fasten a baggage tag to the container handle. On the tag write the product name, formulation, concentration of active ingredient(s) and the date of purchase.

Dry bags should be stored on pallets and covered with plastic to ensure they do not get wet. Do not store liquid materials above dry materials. Store flammable CP products separately from non-flammable CP products.

Segregate herbicides, insecticides and fungicides to prevent cross-contamination and minimize the potential for misapplication. Cross-contaminated CP products often cannot be applied in accordance with the labels of each of the products. This may make it necessary to dispose of the cross-contaminated materials as wastes and could require the services of a consultant and hazardous waste contractor.

Use shelving made of plastic or reinforced metal. Keep metal shelving painted (unless stainless steel) to avoid corrosion. Never use wood shelving because it may absorb spilled CP product materials.

CP product storage structures should be identified such that the nature of the contents is made known to those approaching the building.

The BMPs discussed often address the ideal situation of newly constructed permanent facilities. However, the user is encouraged to apply the principles and ideas put forth to existing facilities, and to portable or temporary facilities that may be used on leased land where permanent structures are not practical.

Plans and specifications for CP product storage buildings are available from several sources, including the NRCS of the United States Department of Agriculture, the Midwest Plan Service, and the UF-IFAS Publications Office.

The current CP storage buildings are in compliance with IFAS guidelines.

4.18 EXCESS FORMULATION

When possible, return excess formulated materials to the CP supplier. In most cases, the excess material must be in an unopened, original container. Contact local dealers for their requirements.

The single best practice to handle excess CP product material is to use it as a CP product in accordance with the label instructions.

4.19 PURCHASE AND TRANSPORT

Appropriately planned and timed purchase of CP products can avoid risks associated with protracted storage.

Adherence to instructions provided by product manufacturers relating to transport of CP products can minimize risks of spillage and contamination in the event of accident or other container failure.

Follow directions for transport provided on product label, taking into consideration exposure to temperature, moisture, UV light and other variables.

Ensure packages and containers are properly closed and secured prior to transport, and are retained in original containers and with original product label attached.

Consider restrictions imposed by manufacturers or transportation agencies on transport within enclosed spaces and/or by personal vehicle.

Appropriate spill response materials should always be transported along with CP products to ensure that immediate spill response can be accommodated.

4.20 PRODUCT USE TRAINING

Training of field operators responsible for handling, loading, and operating spray machinery is essential for effective application of agricultural chemicals.

It is essential that information learned at continuing education classes be transferred to application personnel. Special efforts should be taken to ensure that non-English-speaking field personnel understand proper handling, loading, and operating techniques.

5.0 NUTRIENT MANAGEMENT

Good nutrient management is an integral part of a system of agricultural practices that help conserve and protect natural resources. In fact, water and nutrients are oftentimes linked, and the Florida citrus industry has made great strides in converting many existing groves to low volume irrigation systems. These conversions allow more precise nutrient management via the use of fertigation. As such, implementing appropriate nutrient management practices helps maintain or improve agricultural productivity while minimizing environmental risk.

Management of nitrogen and phosphorus levels, in particular, is essential in maintaining healthy surface water bodies and natural systems in the USSC crop production area. These nutrients originate from a variety of land uses, including: agricultural, urban, suburban, and natural areas. Excess nutrients stimulate algal blooms and growth of noxious plants in receiving water bodies and wetlands. This stimulation of growth may eventually result in reduced dissolved oxygen concentrations due to excessive decomposition of plant material. Moreover, lower dissolved oxygen concentrations may stress desirable game fish, and promote less desirable fish species.

Nitrogen and phosphorus are two of the essential elements for plant and animal growth and are necessary to maintain profitable crop and livestock production. They can also increase the biological productivity of surface waters by accelerating eutrophication, the natural aging of lakes or streams brought on by nutrient enrichment. Although eutrophication is a natural process, it can be accelerated by changes in the land use of a watershed that increase the amount of nutrients added to an aquatic system. Nitrogen and phosphorus both affect eutrophication, but phosphorus is the critical element in most fresh water systems.

Where water salinity increases, as in estuaries, nitrogen generally controls aquatic plant growth. Complicating the problem is the fact that eutrophication sometimes occurs many miles from where high-nutrient runoff originally enters the surface water system. By the time the water quality effects are noticeable (sometimes years to decades after the runoff occurs), remedial strategies can be difficult and expensive to implement. This is why source control of nutrients used in fertilization programs is so important.

5.1 EDUCATION

Proper training of the field operators responsible for handling, loading, and operating fertilizer spreading equipment, and for correct maintenance of field equipment is required and can help achieve desired placement of fertilizers, avoid waste, and prevent contamination of open waters.

Reinforce training with checklists of critical operating points before application of materials. Confirm that each assigned employee is adequately informed about machine operation, rates of discharge, and intended zone of nutrient placement that focuses on "feeding the tree."

5.2 NUTRIENT MANAGEMENT

Develop a nutrient management plan based upon soil, water, plant and organic material sample analyses and expected crop yields. USDA-NRCS routinely develops nutrient management plans, and requires them for practices that receive cost-share benefits. Nutrient management is: management of the amount, source, placement, form, and timing of the application of nutrients and soil amendments to ensure

adequate soil fertility for plant production and to minimize the potential for environmental degradation, particularly water quality impairment.

5.2.1 General Criteria

1. Nutrient Management Plans shall include the following components, as applicable:
    - Aerial site photographs or maps, and a soil map.
    - Current and/or planned production sequence.
    - Soil test results and recommended nutrient application rates.
    - Plant tissue test results, when used for nutrient management.
    - Records for actual fertilizer rate applied. When fertilizer application exceeds recommendations, justification will be required. Assurance should be given by USSC that all over application issues will be resolved.
    - A complete nutrient budget for nitrogen, phosphorus, and potassium for the production system.
    - Realistic yield goals and a description of how they were determined.
    - Quantification of all important nutrient sources (this could include but not be limited to commercial fertilizer, animal manure and other organic byproducts, irrigation water, etc.).
    - Planned rates, methods, and timing (month & year) of nutrient application.
    - Location of designated sensitive areas or resources (if present on the conservation management unit).
    - Guidance for implementation, operation, maintenance, and record keeping.
2. Maximum single application rates of nutrients will be determined based on optimum level of production, producer's goals, soil limitations, site factors, and off-site transport potential.
3. Additional conservation practices that keep nutrients in the soil and root zone area should be planned in environmentally sensitive areas.

Environmentally sensitive areas include, but are not limited to: wetlands, sink holes, wells, mixing sites, karst areas, soils with excessive permeability, and areas that drain into state or federal nutrient restricted areas.

5.2.2 Considerations

1. A nutrient budget worksheet (FL 590-JS) including an estimate of residual amounts present in the soil and in residues of previous crops, along with any organic waste additions, can determine crop nutrient requirements. (The nutrient budget worksheet is available at: ftp://ftp-fc.sc.egov.usda.gov/NHQ/practice-standards/jobsheets/590js.pdf) Additional information is needed following further evaluation by the District and USSC.

2. Realistic yield goals should be set based on soil type, crop variety, tree age and condition, tree density, historical yield data, climatic conditions, and fertilizer costs versus returns.
3. The form of fertilizer and its timing, placement, and method of application can be planned to conform to seasonal variations in nutrient uptake throughout crop development.
4. Consider effects of the seasonal water budget on nutrient balance and on the potential loss by surface runoff or leaching into ground water.
5. Evaluate water quality standards and designated use limitations that exist locally or statewide.
6. Avoid excessive or luxury levels of N, P, and K in the soil to reduce the potential for induced deficiencies of micronutrients.
7. Maintain proper soil pH to provide optimum availability of applied nutrients.
8. Use appropriate application methods and fertilizer formulations that minimize nutrient losses.
9. In high water table soils, water table management will affect the availability and movement of nutrients.
10. Proper calibration and use of equipment will improve nutrient material application efficiency and will reduce undesirable over-applications.
11. Avoid same-place loading/transfer sites to preclude excess contamination of soils in working areas.

5.3 NUTRIENT MANAGEMENT AND UTILIZATION OF WASTE RESOURCES

Use of animal waste and other waste products on land in an environmentally acceptable manner can be helpful in maintaining or improving soil, air, plant, and water resources. Wastes include those from farm, feedlot, dairy operations, compost and agricultural processing plants.

5.3.1 General Criteria

1. Compliance with Federal, state and local laws is required for all utilization of wastes including liquid, slurry, and solid waste. For example, FDEP Rule 62-709 specifies the criteria for use of compost made from solid waste.
2. Waste application will be accomplished in a manner (timing and rate) such that runoff from the application area will not occur due to the application method used.
3. When making applications of waste products to citrus groves, growers will consider factors affecting rate, timing, and application methods as outlined in Florida NRCS Conservation Practice Standard, Nutrient Management (Code 590), available at: ftp://ftp-fc.sc.egov.usda.gov/NHQ/practice-standards/standards/590.pdf.
4. Waste will be applied based on the most limiting nutrient or metal.
5. The soil-limiting nutrient (either N or P) for waste application should be based on the Phosphorus Index calculation (see references for publications showing how the Phosphorus Index is calculated).

6. Crop nutrient removal rates should be based on realistic yields. Crop nutrient removal rates can be obtained from Agricultural Waste Management Field Handbook (AWMFH) or the NRCS has an excellent on-line calculator at: http://npk.nrcs.usda.gov/
7. Waste application setbacks shall be increased from surface water bodies, wells, sink holes, or fractures. Setbacks should be based on criteria for effective filter strips as contained in Florida NRCS Conservation Practice Standard, Filter Strip (Code 393) which can be accessed at: ftp://ftp-fc.sc.egov.usda.gov/NHQ/practice-standards/standards/393.pdf.
8. Content of waste will be analyzed for nutrient and metal (e.g. copper) content.

5.3.2 Considerations

Supplemental fertilizer may be needed to meet the needs of the crop at various stages of plant growth. USSC currently has a FDEP permit for the application of wastewater on the USSC property. Please note that use of wastewater with high conductance could accumulate salts and nutrients into drainage systems, and possibly affect downstream receiving water bodies. These same water bodies may have specific water quality standards or Total Maximum Daily Loads (TMDL) that could be violated through the introduction of high TDS concentrations. The application of wastewater onto the property should remain in compliance with the FDEP permit.

5.4 EMPLOY TISSUE AND SOIL ANALYSES

Fertilizer applications based on leaf tissue and soil tests will help avoid over-fertilization and subsequent losses of nutrients in runoff water.

Application of mobile elements such as N (nitrogen) and K (potassium) should be made on the basis of leaf tissue analysis and production levels. Elements such as Ca (calcium), Mg (magnesium), and P (phosphorus) should be based on soil testing and leaf analysis, instead of regular applications of specific amounts. The comparison of both types of testing will give production standards for applications which are based on plant need and response, rather than routine applications of standard amounts. Proper fertilization results in high yields and minimal environmental effects.

5.5 USE APPROPRIATE APPLICATION EQUIPMENT

Operate machinery as designed so as to achieve precise and desired placement of nutrient materials at specified rates consistent with the form and source of nutrient materials.

Efficient application practices are critical for insuring fertilizer delivery only to target areas, and for reducing losses to leaching and runoff. The following is a list of application techniques for different formulations of fertilizers. Growers may adopt a combination of placement methods exploiting their respective advantages in efficiency and cost. The ultimate goal is to focus on "feeding the tree" by placing nutrients within the root zone of individual trees or drip-line bands along hedgerows of trees. Avoid placement in areas prone to off-site transport of nutrients.

- Precision Agriculture
- Dry Material Spreaders
- Fertigation

- Boom Applications
- Aerial Application

5.6 EQUIPMENT CALIBRATION AND MAINTENANCE

Proper calibration and maintenance of fertilizer application equipment is essential to avoid misapplication of nutrients.

5.7 APPLY MATERIALS TO TARGET SITES

Place nutrients within the root zone of individual trees or drip-line bands along hedgerows of trees. Avoid placement in areas prone to off-site transport of nutrients, especially water furrows.

5.8 AVOID HIGH RISK APPLICATIONS

Do not apply materials under "high risk" situations, such as before forecasted rainfall. Avoid applications of nutrients during intense rainfall, on bare soils with extreme erosion potential, or when water tables are near the soil surface.

For weather information on the Internet, go to:

- FAWN: http://fawn.ifas.ufl.edu/
- NOAA: http://www.nws.noaa.govhttp://weather.noaa.gov/
- The Weather Channel: www.weather.com
- CNN Weather: http://www.cnn.com/WEATHER/
- AccuWeather: http://www.accuweather.com

5.9 FERTILIZER STORAGE

Use caution when storing fertilizer to prevent contamination of nearby ground and surface water.

Fertilizer will be stored in an area that is protected from rainfall. Always store fertilizers separately from pesticides, solvents, gasoline, diesel, motor oil, or other petroleum products. Many fertilizers are oxidants and can accelerate a fire.

Storage of dry bulk materials on a concrete or asphalt pad may be acceptable if the pad is adequately protected from rainfall and from water flowing across the pad. Secondary containment of stationary liquid fertilizer tanks larger than 550 gallons is addressed in DEP rule 62-762, F.A.C. Even where not required, the use of secondary containment is a sound practice.

5.10 SPILLED FERTILIZERS

Immediately remove any fertilizer materials spilled on ground surfaces and apply at recommended rates to crops.

When possible, place a tarp over ground surfaces where fertilizer transfer operations are conducted. Spilled materials should be transferred to the spreader for application to target sites. Spillage can contaminate open waters and thereby cause proliferation of aquatic weeds. Operators of fertilizer spreaders shall be trained how to recover spilled materials for spreader application. Removal of some soil

with the spilled materials is usually necessary and adequate for proper maintenance of this BMP. By its design, the spreader equipment will apply the fertilizer and soil to the target site.

At fixed loading sites, the area can be cleaned by sweeping or vacuuming (or with a shovel or loader, if a large spill), or by washing down the loading area to a containment basin that is specifically designed to permit recovery and reuse of the wash water. Wash water generated should be collected and applied to the target site.

Discharge of this wash water to water bodies, wetlands, storm drains or septic systems is illegal.

5.11 USE CAUTION WHEN LOADING NEAR DITCHES, CANALS AND WELLS

Minimize the potential for spilled materials to pollute surface waters. When possible, locate mixing and loading activities away (according to local setback requirements) from ground water wells, ditches, canals, and other areas where runoff may carry spilled fertilizer into surface water bodies. If such areas cannot be avoided, protect wells by properly casing and capping them and use berms to keep spills out of surface waters. Recover and apply spilled materials to intended zone of application.

A concrete or asphalt pad with rainfall protection permits easy recovery of spilled material. If this is not feasible, loading at random locations in the field can prevent a buildup of nutrients in one location. In this case, place a tarp on the ground underneath the fertilizer hopper while loading. Do not load fertilizers on a pesticide Chemical Mixing Center (CMC) because of the potential for cross-contamination. Fertilizers contaminated with pesticides may cause crop damage or generate hazardous wastes.

5.12 ALTERNATE LOADING OPERATION SITES

Use multiple fertilizer loading and transfer sites to prevent concentration of nutrients in a single area. If this is not feasible, loading at random locations in the field can prevent a buildup of nutrients in one location.

5.13 USE BACKFLOW PREVENTION DEVICES

Use backflow prevention devices on irrigation and spray tank filling systems to preclude entry of nutrients into surface waters. Never leave a filling-tank unattended.

5.13.1 Filling Tanks in the Field

Special precautions should be taken when filling tanks using a hose. Maintain an air-gap between the filling-hose and the liquid tank-mixture. Never leave a tank unattended when it is being filled.

5.13.2 Fertigation and Backflow Prevention Equipment

An anti-siphon device is a safety device used to pre-vent backflow of a mixture of water and chemicals into the water source, or vice versa. In the case of fertigation, the chemicals are fertilizers. Currently, Florida state law (Florida Statutes Section 487.064 for pesticides and Section 576.087 for fertilizers) requires that backflow prevention equipment be installed and maintained on irrigation systems in which chemicals are injected for agricultural purposes. The possible dangers in fertigation include backflow of fertilizers to the water source causing contamination, and water backflow into the fertilizer storage tank. Backflow prevention is an extremely important practice in the prevention of both ground and surface water contamination. Backflow to the storage tank can rupture the tank or cause overflow, contaminating the area around the tank and perhaps indirectly contaminating the water source. Safety equipment is

available which, when properly used, will protect both the water supply and the purity of the fertilizer in the storage tank.

5.14 SPLIT APPLICATIONS THROUGHOUT SEASON

Dividing the annual fertilizer requirement into two or more applications can minimize leaching during the summer rainy season and help maintain the supply of nutrients over the long growing season of Florida.

Frequent fertigations can be an efficient method of application for N and K while minimizing the potential for leaching of nutrients during excessive rainfall events. The trade-off between costs vs. fertilizer use efficiency and resource protection must be considered.

5.15 EROSION CONTROL

Erosion-control practices will be utilized to minimize soil loss and runoff that can carry dissolved and attached nutrients on soil particles to surface waters. A minimum of four (4) particulate matter and sediment controls shall be implemented form the BMP equivalent points reference table.

Vegetative filter strips are effective in reducing the levels of suspended solids and nutrients.

5.16 IRRIGATION MANAGEMENT

Irrigation should be limited to wetting only the root zone where possible. Excessive irrigation can transport nutrients below the root zone through leaching. Proper scheduling and uniform water distribution are necessary to assure control.

5.17 USE OF ORGANIC MATERIALS

In the event of a surface application (mulching), use of organic materials like horticultural waste and urban plant debris (yard trimmings) should occur when possible to help increase soil organic matter, retain nutrients and moisture, improve biological eco-systems, and supply slowly-released nutrition.

The surface application of slowly-degraded organic waste materials like horticultural waste and urban plant debris can increase soil moisture retention and nutrient-holding capacity. The nutrient additive properties of organic matter support:

- Economical ways to safely use non-hazardous wastes.
- Maintenance or increases in soil organic matter content.
- Protection of water quality.
- Protection of air quality.
- Reduction of energy used in manufacturing chemical fertilizer.

Both microbial mineralization and immobilization can occur during decomposition of high carbon-low nitrogen organic materials like horticultural waste. Mineralization occurs when organic forms of a nutrient are converted to inorganic forms. Immobilization is the reverse of this process where microorganisms convert inorganic forms of nutrients to organic forms. The organic forms of the nutrients are not available to plants as they are bound in some part of the soil organic matter. Plants take up nutrients in inorganic forms. Thus, immobilization reduces nutrient (particularly nitrogen) availability, while mineralization increases nutrient availability.

Nitrogen-poor organic materials like straw, fresh sawdust and most fresh horticultural waste cause microorganisms to remove large amounts of inorganic nitrogen from the soil during decomposition, since that nitrogen is required to build new microbial cells. This process decreases nitrogen availability to citrus trees. However, the nitrogen consumed by the microorganisms will be slowly released when microbial cells decompose.

5.18 WELL PROTECTION

Prevent ground water contamination by back plugging improperly constructed and/or deteriorated irrigation wells.

This practice involves the protection of existing wells and prevention of problems in wells that are being planned. For existing wells, management activities are aimed at reducing the potential for contamination. This includes evaluating and, if necessary, moving or modifying potential sources of pollution. Such sources of pollution may include fueling areas and/or areas where pesticides and fertilizer are handled or mixed.

The permanent plugging and elimination of such wells may be eligible for cost-share assistance through the District. Please contact your local District Service Office for information.

Points to Consider:

- Anti-siphon devices should be attached to all system discharge points so that backflow siphoning does not contaminate the aquifer.
- Check with local health departments or state water management districts for setback guidelines regarding wells.
- When no longer in use, proper decommissioning or plugging of a well prevents the re-entry of surface water and transport of contaminants to the ground water. Check with your local water management district or USDA-NRCS office for well decommissioning and plugging guidelines.
- Wells should be capped or fitted with valves that close tightly when not in use to reduce the potential for contamination. Artesian wells should be fitted with control valves so that water flow can be regulated or stopped when water is not needed.

5.19 USE APPROPRIATE SOURCES AND FORMULATIONS

Reduce the potential for nutrient leaching and off-site movement by choosing appropriate sources and formulations of fertilizer based on nutritional needs, season (rainy vs. dry), and anticipated weather conditions to achieve greatest efficiency and reduce potential for offsite transport. Utilize controlled-release and slow-release formulations when feasible.

Nitrogen source materials are grouped into three categories: inorganic, synthetic organic, or natural organic. The inorganics and synthetic organics are usually high-analysis materials that are most economical to use in citrus groves. These nutrient source materials are readily available to plants unless they have been formulated in a controlled-release form. Natural organic materials are less readily available and are usually lower in nutrient analysis.

5.20 SALINITY

Fertilizer sources should be monitored closely in groves with high salinity levels. Fertilizers with high salt index levels can compound existing salinity problems.

Additional discussion on salinity management is found in the Water Resource Management Section.

The frequency of injecting nutrients or of applying granular fertilizer has a direct effect on the concentration of total dissolved solids (TDS) in the soil solution. A fertilization program that uses frequent applications with relatively low concentrations of salts will normally result in less salinity stress than programs using only two or three applications per year. Controlled-release fertilizers and frequent fertigations are ways to economically minimize salt stress when using high salinity irrigation water.

Selecting nutrient sources that have a relatively low osmotic effect in the soil solution can help reduce salt stress. The osmotic effect that a material adds to a soil solution is defined as its salt index relative to sodium nitrate, taken to be equal to 100. Since sources of phosphorus (P) generally have a low salt index, they usually present little problem. However, the salt index per unit (lb) of N and potassium (K) should be considered.

The salt index of natural organic fertilizers and slow-release products are low compared to the commonly used soluble fertilizers. High-analysis fertilizers may have a lower salt index per unit of plant nutrient than lower-analysis fertilizers since they may be formulated with a lower salt index material. Therefore, at a given fertilization rate the high-analysis formulation may have less of a tendency to produce salt injury. For instance, the salt index of a fertilizer blend formulated made from ammonium nitrate and potassium nitrate will be about 30% less than that with the same N-P-K analysis blend formulated from ammonium nitrate and muriate of potash (KCl). In addition, the Cl in KCl or Na in NaNO3 materials add more toxic salts to the soil solution.

Choose fertilizer formulations that have the lowest salt index per unit of plant nutrients. Increase the frequency of fertilizations, thereby making it possible to reduce the salt content of each application and aid in preventing excess salt accumulation in the root zone. Maintain optimum but not excessive nutrient levels in soil and leaves with rates based on the long-term production from the grove. Fertilizer rates can usually be lower for trees with high salinity since production levels will probably be lower. Leaf tissue analysis should be used to detect excessive Na or Cl levels or deficient levels of other elements caused by nutrient imbalances induced by salt stress. Leaf Na levels greater than 0.2% and Cl levels over 0.5% indicate imminent problems.

High rates of salt application can alter soil pH and thus cause soil nutrient imbalances. Some ions can also add to potential nutrient imbalances in trees. For example, Na can displace K, and to a lesser extent Ca, in soil solutions. This can lead to K deficiency and, in some cases, to Ca deficiency. Such nutrient imbalances can compound the effects of salinity stress. Problems can be minimized if adequate nutritional levels are maintained, especially those of K and Ca.

5.21 CONSERVATION BUFFERS AND SETBACKS

Strategically incorporating vegetative buffers – either naturally occurring ones or planted forbs and grasses – into the citrus grove design can help to protect water quality by providing biological filtration, increasing residence time and/or residual nutrient uptake.

Managed properly, these vegetative areas or conservation buffers may provide pretreatment, formal treatment and other treatment train opportunities. A treatment train effect is simply a combination of nonstructural and structural BMPs, which are generally effective for reducing or preventing non-point source pollution. Generally speaking, there are certain non-cropped areas that could qualify as conservation buffers within a typical agro-eco-system. Vegetated field borders, tree row middles, water furrows, ditch and ditch banks, wetlands/set-back areas and associated reservoir systems are examples.

Depending on the grove's surface water management system design, buffer areas can contribute significantly and help to manage offsite nutrient impacts. This whole farm management approach ultimately reduces a grower's risk of incurring negative environmental consequences. The BMPs discussed below are intended to give the reader information for the practical application of conservation buffers.

5.21.1 Pre-Treatment Options

Manage tree row middles by keeping them well grassed and by maintaining a minimum blade height of two inches. Growers should not rotary mow when standing water is present. Growers may also want to investigate the feasibility of incorporating leguminous plant(s) within the middles, as these plants may be used as an additional source of nitrogen.

Water furrows and lateral ditches should also be managed to encourage grass cover in order to help reduce flow velocities, thus providing an opportunity for particulate matter to settle out. See BMPS in the Erosion Control and Sediment Management Section for more information on water furrow and ditch bank maintenance.

5.21.2 Formal Treatment Options

- Riparian Buffers – A riparian buffer is an area of trees and/or shrubs located adjacent to and up-gradient from associated watercourses. Existing groves that border perennial watercourses and were constructed before SFWMD surface water regulations should, when economically feasible, explore the use of a riparian buffer. Water sheet flowing across this type of buffer will be treated before discharging to the watercourse. Air drain-age is an important aspect of crop and tree damage during cold periods. Prior to implementing a riparian buffer, consideration should be given to its effects on air drainage.
- Dedicated Conservation Buffers – Grassed waterways and/or filter strips are both excellent conservation buffer choices, and can be used to convey and treat smaller volumes of discharge water with a moderate degree of success. In general, these passive treatment areas are more effective in removing phosphorus that is attached to soil particles rather than dissolved nitrogen. Groves that have some topographic relief should consider using grassed waterways or filter strips to treat and discharge surface water runoff.
- Treatment Train Effects - Consider using a combination of structural and non-structural controls to mitigate the potential for offsite nutrient impacts, especially when discharging to sensitive downstream water bodies. See B17 in the Erosion Control and Sediment Management Section for more information.

5.21.3 Other Required Setbacks

Wetland setback areas, also referred to as wetland buffer zones, provide water quality treatment opportunities. If you have an active Environmental Resource Permit for your grove, you are generally required to abide by an average 25 foot setback. Likewise, NRCS generally requires 50 feet along the path of water flow for a filter strip that is being used to address soluble nutrient problems. NRCS buffer practices are listed below and each practice has slightly different uses that should be matched with the specific site. Each NRCS buffer practice may have different minimum widths and other specifications based on the specific resource problem(s) to be addressed.

6.0 ACCEPTABLE AGROCHEMICALS AND NO APPLICATION PERIODS

Because of the intended future land use, care needs to be taken to ensure that at the time of the property's conversion to a reservoir, that the presence of agrochemicals is minimal and will not cause adverse impacts to the anticipated ecosystem. During the interim use of the property, the intent is to phase out the application of identified pesticides on a specified time table to allow for natural degradation.

In addition, as current landowner, the District must ensure that all application of agrochemicals on the grove is conducted in accordance with all applicable laws and regulations.

The **Chemical Application Restrictions** matrix, given below, should be followed. This matrix is based on the U.S. Fish and Wildlife Service's "Derivation of No Application Periods". A copy of the document is included in **Appendix A**. The agrochemical list should be reviewed annually for the effectiveness of the applied chemical, changes in regulations regarding specific pesticides, and changes in the management and use of the pesticides. The experimental use of pesticides and herbicides is prohibited during the interim period. All agrochemicals must be applied in strict accordance to label instructions and restrictions.

CHEMICAL APPLICATION RESTRICTIONS

The following is an example list of chemicals, and at the completion of the Phase I and II ESA activities, this list may change. The following chemicals have the potential to be used subject to the restrictions noted below.* Chemicals not specifically listed below may be evaluated on a case by case basis and added to the appropriate category below. Chemicals with no analytical test method and identified as a potential environmental risk, the chemical manufacturer will be contacted to obtain the chemical standard. The District will then contract a Florida based laboratory to develop an analytical test method for the chemicals.

Citrus Grove

A. May be used at any time but only according to label restrictions:

2,4-D (*Landmaster*)	Isopropylamine salt (*Arsenal*)	Simazine (*Sim-Trol*)
435 Spray Oil (*Sun Pure*)	Mineral oil (*Saf-t-side*)	Triclopyr (*Remedy Ultra*)
Diuron (*Karmex, Direx*)	Paraffin oil (*Citrufilm*)	Dimethyl ammonium chloride (*C-soap*)
Glyphosate (*Roundup*)	Phosphoric Acid (*Nutriphite Magnum*)	

B. Must be discontinued at least 3 months prior to flooding:

Abamectin (*Agri-Mek*)	Oxamyl (*Vydate*)	Alkyl dimethyl benzyl ammonium chloride (*Bell Quat*)
Dimethoate (*Dimethoate*)	Phosmet (*Imidan*)	Carbaryl (*Sevin*)
Fenpropathrin (*Danitol*)	Trifloxystrobin (*Gem Fungicide*)	

C. Must be discontinued at least 6 months prior to flooding:

Aldicarb (*Temik*)	Chloropyrifos (*Nufos*)	Dicofol (*Kelthane*)
Cypermethrin (*Mustang*)	Imidacloprid (*Provado*)	

D. Must be discontinued at least 1 year prior to flooding:

Bromacil (*Krovar*)

E. Must be discontinued at least 2 years prior to flooding:

Mefenoxam (*Ridomil*)

F. Period of discontinuation will be based on the rates of application and copper concentrations in the groves:

Copper Hydroxide (*Champ*)	Zinc, Manganese, Iron, Magnesium, Nitrogen (*Citrite, Dyna Gro*)

* Any pesticide, regardless of the above categories, that is shown to be present in the soil, at or above the SCTLs, may require additional restrictions, including reductions in use or the complete elimination of its use. These situations will be evaluated on a case-by-case basis.

6.1 COPPER COMPOUNDS

Copper is an essential element required for the successful and economical growing of citrus. It is necessary for chlorophyll formulation in the leaves and acts as a catalyst for other plant reactions. It also has beneficial uses as a fungicide, herbicide, and bactericide. It is applied to the soil surface as a granular additive to fertilizer, and directly to the foliage as a spray mix. The Phase II ESA did not identify elevated copper levels in the citrus groves above the Service provisional Snail Kite threshold level of 85 mg/kg. Based on the information provided by USSC, at the current application rates of copper-based agrochemical, the soils within the citrus groves will not be impacted with copper above the 85 mg/kg threshold.

During this interim use period, soil samples should be collected for select areas within the groves to confirm that residual copper concentrations are not accumulating in the soil. In the event that elevated copper concentrations are detected above the 85 mg/kg threshold, then the District and USSC will jointly evaluate the current copper applications for the citrus operation.

If the yearly sampling again indicates elevated copper above the 85 mg/kg the District and USSC will work together to develop a copper application that will control pests and limit the residual copper levels in the soils as much as practical.

7.0 PETROLEUM AND HAZARDOUS WASTE MANAGEMENT

7.1 GASOLINE AND DIESEL FUEL STORAGE AND CONTAINMENT

The goal of AST management is to minimize the possibility of inadvertent petroleum product discharges and properly manage any spills and cleanups. Stationary fuel storage tanks should be in compliance with the FDEP storage tank regulations (Chapter 62-761, FAC (Petroleum Storage Systems)) for both underground and aboveground storage tanks.

Site verification will include discussion with operation managers to understand the agricultural operation petroleum storage and containment management approach. In addition site inspections will be made to observe the following items:

7.1.1 On-Site Equipment

Permanent fuel pumps should be stationed on concrete or asphalt surfaces away from groundwater wells and ditches, laterals and canals where water runoff may carry or transport inadvertently spilled product. Pumps should be equipped with automatic shut off mechanisms. Aboveground petroleum storage tanks with volumes of 550 gallons or greater must be registered and located within secondary containment systems unless of double-wall construction. Visual inspections should be conducted on at least a monthly basis of the storage tanks and hoses to ensure that the system is free from leakage from tank seams, connections, and fittings.

7.1.2 Fuel Delivery

The fuel delivery driver should report to facility manager upon arrival prior to unloading. An agricultural operation employee should verify available tank capacity prior to product transfer and should remain onsite during delivery to monitor the product transfer. Spill and overfill clean-up equipment, such as absorbent booms or absorbent materials, should be stored nearby for immediate spill containment and clean up.

7.2 EQUIPMENT CLEANING AND MAINTENANCE

The same level of preventive measures should be taken to minimize any adverse water quality impacts from the cleaning of equipment as with agrochemical handling and application. Preventive maintenance and emergency repair of machinery and equipment performed on site should be conducted in a centralized area over an impermeable surface, and be situated at least 100 feet from the closest groundwater well or surface water, grove ditch, lateral, or canal. It is recommended that equipment maintenance be limited to minor or emergency repairs. Onsite maintenance activities, such as engine or mechanical repair, which generate a waste or waste by-product, must be containerized and properly disposed of. Where contamination is already documented in the area, every effort should be made not to increase the existing contamination levels.

Site verification will include discussion with operation managers to understand the agricultural operation hazardous waste management approach. In addition site inspections will be made to observe the following items:

7.2.1 Equipment Maintenance

It is recommended to use compressed air to remove clippings and dust from machinery. This will cause less wear to the equipment's hydraulic seals, eliminate wash water, and produce dry material that is easy to handle. For regular field equipment washdown other than pesticide application equipment, and degreaser or solvents, allow wash water to flow to a grassed retention area, swale, or fields. Do not allow wash water to flow directly to surface water, grove ditches, laterals, or canals. Minimize the use of detergents and use only biodegradable, non-phosphate type. Use spray nozzles that generate high-pressure streams and low volumes that can minimize the amount of water used to clean equipment. If equipment is to be intensively washed, conduct over a concrete or asphalt pad that allows the water to be collected. Collected wash water can be handled through a recycling system, treatment system, off-site disposal at an industrial wastewater treatment facility, or use the wash water for field irrigation.

7.2.2 Solvents and Degreasers

The current facility does not conduct major repairs of equipment on-site. Only routine maintenance is conducted on-site. The introduction of an equipment maintenance area as well as the use of solvents or degreasers onsite must be reviewed and approved by the District prior to the use or construction of the maintenance facility.

Should such approval be granted by the District, general best management practices recommends the replacement of solvent baths with recirculating aqueous washing units. Soap and water or other aqueous cleaners are often as effective as solvent-based cleaners.

7.2.3 Paint

The USSC properties do not maintain an on-site painting facility. All painting is done manually. The introduction of an equipment painting facility (i.e., paint booth, spray hood, etc.) onsite is not allowed. The painting of equipment by power sprayers is prohibited. Such painting must be conducted off-site.

7.2.4 Used Oil, Coolant, and Lead-Acid Batteries

Each of the main properties currently store new oil, used oil, coolants and/or lead acid batteries on-site. These items are properly marked and stored and are in compliance with local and State regulations. The storage of more than what would be used for daily use of these chemicals and products is prohibited. The construction of a storage area onsite to store these chemicals must be reviewed and approved by the District prior to the storage or construction of the facility.

Used oil, coolant and lead-acid batteries are not currently stored onsite, and are not approved to be stored onsite by the District. However, if this type of activity should be approved by the District, the following BMP guidelines must be implemented.

Used oil and oil filters should be stored in separate marked containers and recycled. Oil filters should be drained and taken to the same place as the used oil, or to a hazardous waste collection site. Coolants and antifreeze must be recycled or disposed as a hazardous waste. Do not mix used oil with used coolant or sludge from solvents. Lead-acid storage batteries are classified as hazardous wastes unless they are recycled. Batteries should be stored on an impervious surface and preferably under cover until delivery to an authorized recycling facility.

All used oil, coolant, and lead-acid batteries on the properties are stored in containers in accordance with FDEP rules until being transported offsite for disposal by a licensed contractor.

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8.0 SAMPLING AND COMPLIANCE PLAN (CITRUS FIELDS)

8.1 VERIFICATION SAMPLING

Citrus cultivated area sampling will be conducted by the District on an annual basis. Soil samples shall be collected from the cultivated area at randomly selected locations based on the grid pattern and numbering system used in the Phase I/II ESA. The BMP annual sampling event will randomly select a number of those discrete locations sampled during the Phase I/II ESA. The collected samples will be analyzed for a number of parameters of concern. Based on the Phase I/II ESA findings and review of the chemicals list provided by USSC, the sampling activities by the District will involve 5-acre discrete samples using close composite methodology from the top 6 inches of the soil. The collected discrete samples will then be analyzed for a number of parameters of concern.

The number of locations to be sampled is determined according to the *a priori* statistical procedure recommended by the United States Environmental Protection Agency (EPA, 1989, Section 6). This procedure is based on commonly used, well established statistical hypothesis testing processes, in which, collected data during each year is compared to the baseline dataset in order to detect the presence of any statistically significant difference (EPA, 2000). For determination of the sample size, EPA (1989) suggests a null hypothesis that is equivalent to the condition, under which the baseline and subsequent datasets display statistically significant differences. Conversely, the alternative hypothesis corresponds to a condition, under which the baseline and subsequent datasets are devoid of any statistically significant difference. Each year, upon collection of one round of post-baseline samples, the compiled baseline and subsequent datasets are statistically compared to assess whether further investigations are warranted. The components of the proposed statistical process are described in the following sections.

8.1.1 Determining Number of Baseline Locations

EPA (1989, Section 6.3.2) provides a quantifiable measure for determining an adequate sample size. The sample size is driven by three factors: (a) the chosen decision errors, (b) the variability of the potential contaminants of concern, and (c) the desired resolution, *i.e.*, the difference between the baseline and subsequent datasets that needs to be detected at the chosen confidence. The resulting equation is:

$$n = \frac{(z_{1-\alpha} + z_{1-\beta})^2 s^2}{\Delta^2}$$

where,

n = number of grids to be sampled each year

α = the false positive rate, Type I error, or the significance (tolerable error for missing an actual difference between the baseline and subsequent datasets)

$1-\alpha$ = the confidence (probability of correctly identifying a significant change)

β = the false negative rate, or Type II error (tolerable error for incorrectly declaring a difference between the baseline and subsequent datasets)

$1-\beta$ = the test power (probability of correctly identifying the absence of no difference)

$z_{1-\alpha}$, $z_{1-\beta}$= the confidence and power normal deviates

s^2 = standard deviation of parameter of concern

Δ = The minimum difference between the mean concentrations of the baseline and subsequent datasets to be detected at the chosen confidence

Samples collected at the selected locations during the Phase I/II ESA conducted on the USSC property by PSI in August and September 2008 shall be used as the baseline for comparison to future sampling results. Among parameters of concern, copper has been analyzed extensively during Phase I/II ESA. The reported concentrations of these analytes based on 5-acre discrete samples from citrus fields are used in order to compute their corresponding mean and standard deviation, as listed in Table 8.1. This table also displays the number of samples based on the chosen decision errors. In these calculations, the desired minimum difference is set as 20% of the computed mean concentrations. The resulting sample size is 72 locations, which shall be randomly selected for sampling as part of the BMP efforts, as highlighted in Table 8.1.

8.1.2 Baseline/Subsequent Datasets Statistical Comparisons

Annual BMP sampling will be conducted, at field locations with the same GPS coordinates measured during the initial sampling and at a time mutually agreed upon by the parties so as to minimize damage to field crops, to ensure consistency with the original Phase I/II ESA results. Upon completion of each annual BMP sampling round, the analytic results of parameters of concern will be compared to those compiled in the baseline and previous BMP datasets. For this purpose, a series of comprehensive statistical two-sample tests will be conducted. Pursuant to DON (2002), as listed on Table 8.2, two difference hypotheses will be assessed, including:

- Area-wide differences between the baseline and subsequent datasets: This hypothesis corresponds to a condition, under which the baseline concentrations are consistently different from the subsequent concentrations. Consequently, the statistical tests will be conducted through comparison of mean (parametric) and median (non-parametric) concentrations.
- Localized differences between the baseline and subsequent datasets: This hypothesis corresponds to a condition, under which only the elevated baseline and subsequent concentrations are different. Consequently, the statistical tests will be conducted through comparison of higher concentrations or exceedance ratios in each dataset.

The procedural aspects for the selection and implementation of the cited tests in Table 8.2 are described in details in DON (2002, Chapter 4). Appropriate statistical comparisons, including parametric t-tests, non-parametric Wilcoxon Rank Sum test, and non-parametric Slippage tests, will be conducted annually. Depending on the statistical characteristics of the subsequent datasets, additional test may be performed. In the case of detection of a statistically significant increase at 5% significance, when the increase in mean or median concentrations is greater than 20 %, among subsequent measured concentrations with respect to the baseline concentrations, additional investigations will be pursued.

The specific objectives of additional investigations are: (a) to determine whether the detected increase in post-baseline concentrations are real, and not numeric artifacts caused by the variability of individual samples results, and (b) if real, to determine whether the detected increases in post-baseline

concentrations are due to inappropriate practices by the tenant. For this purpose, additional investigations will be initiated, including a review of laboratory QA/QC results and information provided by the tenant concerning its chemical use practices during the period of interest. If an increase in mean concentrations is attributed to few outlier samples among post-baseline data, locations associated with these outliers will be re-sampled to ensure the validity of the original results. The cost of additional investigations shall be the responsibility of the party requesting it.

If the District determines that a detected increase in mean or median concentrations in excess of 20% is a numeric artifact caused by the variability of individual samples, or attributed to historic conditions, no further action with regards to the tenant's lease will be pursued. On the other hand, if the increase in mean or median concentrations in excess of 20% is deemed to have been caused by other factors, the District will notify the tenant in writing of its determination and its basis, and the tenant will be requested to implement those measures, if any, that the tenant considers appropriate to prevent further increases in concentrations, including but not limited to additional sampling or best management practices.

If a statistically significant increase in concentrations is detected during a subsequent consecutive year and determined by the District to not be a numeric artifact or caused by variability of individual samples, the tenant shall work cooperatively with the District to develop a more comprehensive BMP plan to reduce or eliminate further increases. The new BMP plan shall be approved by the District, implemented by the tenant, and incorporated into the lease and, in the case of a subtenant, its sublease. In the event a subsequent consecutive sampling event results in a third, consecutive statistically significant increase, the District, in consultation with the tenant, shall review the tenant's standard farming practices, which review should include an assessment of the practices in terms of potential risk to future aquatic ecosystems or human health. If it is determined that the increase in concentrations may cause significant risk to future ecosystems that may be constructed in the area or human health to workers or occupants, the tenant will implement changes to its standard practices prescribed by the District, after joint consultation with the tenant, to reduce the potential for such risk. Failure to implement this review within the prescribed schedule will be considered a default of the tenant's lease.

8.1.3 Summary of BMP Sample Plan

Table 8.3 lists BMP sample plan inside and outside of citrus cultivation areas, as well as the current list of parameters of concern. Given the fact that for a number of parameters of concern there are currently no baseline dataset available, the sample size computations will be repeated after the first round of BMP periodic sampling, which may result in applicable modifications of this BMP Plan to address elevated parameters of concern covering parts or the entire extent of the investigated areas. Future changes in subsequent rounds of BMP may include further division of the investigated areas into more homogenous subareas for the purposes of sampling and statistical comparisons. Such changes may require additional sampling to accommodate the delineated subareas. Furthermore, in the event that obvious and excessive impacts are visibly detected during periodical site visits conducted by the District, a more comprehensive site specific sampling plan, which would depend on the magnitude of the impact, should be developed under the direction of the District and any applicable regulatory agencies. A list of potential parameters to be analyzed for is given below.

- EPA Method 8141 (Organophosphorus Pesticides)

- EPA Method 8151 (chlorinated herbicides)
- EPA Method 6010/7471 (copper)
- FL-Pro Method (total residual petroleum hydrocarbons)
- EPA Method 8100 (polynuclear aromatic hydrocarbons)
- EPA Method 8020 (volatile organic hydrocarbons)

Table 8.1. Statistical Determination of the Number of Baseline Grids

Decision Parameters	Selected Value	Normal Variate	
Significance = alpha	5%	$z_{1\text{-alpha}}$ =	1.64
Power = 1 - beta	80%	$z_{1\text{-beta}}$ =	0.84

Chemical-Specific Parameters	Copper (mg/kg)
Desired Resolution set at 20% of Baseline Mean	6.4
Baseline Mean*	32.2
Baseline Standard Deviation*	21.9
n (Number of Samples)	**72**

*Computed based on Phase 2 Citrus 5-acre Discrete (CD) Data

Table 8.2. Statistical Comparative Tests

Difference Hypothesis	Test	Comparison	Type
Area-wide Difference	Wilcoxon Rank Sum (WRS)	Median	Non-parametric
	Gehan	Median	Non-parametric
	Student's two-sample t-test	Mean	Parametric
	Satterthwaite t-test	Mean	Parametric
Localized Difference	Slippage	High concentrations	Non-parametric
	Quantile	High concentrations	Non-parametric
	Two-sample test of proportions	Percent of measurements above a given cutoff	Non-parmetric

Table 8.3. Summary of Sample Plan

Areas	Number of Samples		Parameters*
Citrus Cultivation Area	72 samples	Annually (5-acre discrete sample using close composite methodology – top 6'')	Copper Dicofol Diuron Mefenoxam
Pump Stations	No Sample	If no staining / stressed or disturbed vegetation	
	1 each site	If impacts observed (five point composite soil sample – top 6'')	EPA Method 602 EPA Method 610 FL-PRO
Chemical and Equipment Storage Areas	No Sample	If no staining / stressed or disturbed vegetation	
	1 each site	If impacts observed (five point composite soil sample – top 6'')	EPA Method 602 EPA Method 610 FL-PRO Copper Dicofol Diuron Mefenoxam

**Parameter Descriptions*

EPA Method 602 (purgeable aromatics)
EPA Method 610 (polynuclear aromatic hydrocarbons)
Copper by EPA Method 6010/7471
Dicofol by EPA Method 8081
Diuron by EPA Method 8151
Mefenoxam by EPA Method 8141

9.0 STANDARDIZED FORM: BMP SITE VERIFICATION FINDINGS SUMMARY

Future BMP site verification visits will be conducted at the request of the District. BMP implementation will be reviewed per the guidelines and implementation requirements described for each BMP earlier in this document as well as taking site specific issues and time of year into account. The site verification findings, including a written review of observations, site photographs taken, and a summary of records reviewed, are expected to be provided by the field reviewer in a detailed report. The field verified implementation status of each BMP will be classified in one of three categories:

- Implementation Verified
- Implementation Verified with Comment
- Additional Attention Required

The standardized form for reporting *BMP Site Verification Findings Summary* to be included in the BMP field verification report is included in Appendix B.

APPENDIX A

Derivation of "No Application Periods" for Interim Use Pesticides

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I. INTRODUCTION

The South Florida Water Management District (SFWMD) is actively acquiring agricultural lands in South Florida in connection with the Everglades Restoration Project. These lands are slated for various water management projects including conversion to water attenuation reservoirs, creation of stormwater treatment areas (STAs) for removal of phosphorus and other nutrients, and restoration of wetlands in areas formerly drained for agriculture. All of these projects will likely attract large numbers of birds and other wildlife. Since all of these areas were, or still are, agricultural areas, they have probably been exposed to heavy pesticide applications for decades and residues of some of those pesticides very likely still remain in the soil. Some of the pesticides used were organochlorine compounds such as toxaphene and DDT, which are now banned due to their extreme persistence in soil and their tendency to bioaccumulate in the food web. Residues of these chemicals in soils at a recent wetland restoration project in Florida (Lake Apopka) have resulted in bird die-offs following flooding of the site.

Following land acquisition for a water management project, there may be a delay of up to five years before completion of the project and actual flooding of the wetland or reservoir occurs. During this "interim use period," the former landowner is usually allowed to lease the property and continue with existing agricultural uses. Because of the risks to fish and wildlife that will be attracted to the site following flooding, questions arise as to what types of pesticides, and in what quantities, should be allowed to be applied to these lands during the interim use period. This document was developed in response to these questions.

Because the U.S. Fish and Wildlife Service (Service) must approve these interim uses of grant lands, it has sought to discover what chemicals are being used in conjunction with the uses. The Service has sought the assistance of the SFWMD in this effort; however, the Service and the SFWMD do not agree as to the necessity for, and the feasibility of, obtaining this information from the former landowner. This issue has delayed the finalization, acceptance and implementation of a mutually agreeable protocol by which the SFWMD can seek, and the Service grant, approval of the interim uses. Until the protocol can be developed, the Service cannot provide formal approval of the uses.

In order to resolve this issue, the Service has developed an alternative to requiring the SFWMD to submit chemical use information. Instead, the protocol itself will contain the following chemical use schedule, which the SFWMD will incorporate the pertinent portions into any leases, reservations, or any other methods of allowing an interim use on lands acquired with grant funds. The schedule identifies chemicals which may be used on grant lands, and the amount of time the use of each chemical must cease prior to the incorporation of the parcel into an Everglades restoration project. The time period for each chemical is based upon that chemical's $T_{1/2}$ value (half-life). Accordingly, regardless of which chemicals had been applied to a specific parcel before it was acquired by the SFWMD with grant funds, the SFWMD will be authorized only to allow the use of certain chemicals for certain amounts of time.

II. METHODS

Information on persistence and degradation, toxicity, and use of pesticides in Florida was obtained from various internet databases and published references. The publication *Summary of Agricultural Pesticide Usage in Florida: 1995 - 98* (Shahane, 1999) was reviewed to develop a list of pesticides commonly used in South Florida. Data on half-life, degradation rate, and toxicity of these substances were obtained primarily from the Hazardous Substances Data Bank (HSDB), the Environmental Fate Database (EFDB), and the Extension Toxicology Network (EXTOXNET). For many of the chemicals used in Florida, environmental fate has been researched extensively and numerous literature values for half-life and/or degradation rate were available. For some chemicals, only a few values could be located.

Degradation rates of pesticides in soil can vary tremendously depending on soil type, climate, soil pH, moisture content, depth beneath the surface, and other variables. Therefore, the $T_{1/2}$s and degradation rates reported in the literature for the same chemical may vary over a wide range, depending on the conditions in the different studies. No attempt was made to select only those studies most appropriate to conditions in Florida soils. All relevant values for a chemical, including both field and laboratory experiments, were included in the database for that chemical; however, obviously irrelevant studies (such as those using sterile soils) were not included.

Many studies presented calculated soil $T_{1/2}$ values for the chemical being studied, and these values were entered directly into the database for that chemical. Other studies did not calculate $T_{1/2}$ values, but instead presented raw degradation rates. For example, an entry might state that the chemical was 67% degraded in 10 days. For these situations, the $T_{1/2}$ was calculated using the following formula (assuming 1st order kinetics) (Casarett et al., 1996):

$$T_{1/2} = \frac{.693 * t}{2.303(2 - \log(100 - d))}$$

where t = time since application and d = percent degraded.

All $T_{1/2}$ values obtained directly from the online databases and those calculated from raw degradation data were entered into a spreadsheet (see Appendix A). Using all of these data, median and maximum $T_{1/2}$ values were determined for each chemical. In addition, some studies presented persistence times for pesticides, i.e., the length of time required for all of the chemical to be degraded. Although $T_{1/2}$ values could not be calculated from these data, the range of reported persistence was also recorded. Table 1 summarizes all half-life, persistence, and toxicological information considered for each chemical.

The "no application period" is defined as the period of time prior to conversion of the agricultural land to conservation purposes (e.g., flooding to create wetlands) during which a particular pesticide hazardous to fish and/or wildlife should *not* be applied, in order to allow adequate time for breakdown

of pesticide residues before use of the land by Service trust resources. This period of time was defined as 5 times the median half-life, representing 97 percent degradation. Based on this 5 X $T_{1/2}$ value, the pesticide was placed into one of the following no application periods: 3 months, 6 months, 1 year, or 2 years (Table 1). Due to uncertainties of the planning and scheduling process, it was decided that those rare pesticides requiring more than 2 years to break down should not be applied at all.

In those cases where $T_{1/2}$ data were scanty or differed substantially from persistence data, professional judgement was used. Preference was sometimes given to persistence data, particularly in the case of highly toxic compounds. For example, the pesticide disulfoton, which is highly toxic to fish and wildlife, was placed in a 1 year no application category based on the longer persistence of toxic metabolites compared to the parent compound. In this case, use of five times the median half-life of the parent compound would have underestimated the breakdown time to nontoxic products (Table 1).

III. RECOMMENDATIONS

A. The following pesticides are approved for application during the interim use period with **no restrictions** other than those required by the label:

2,4-D	glyphosate
Bacillus thuringiensis (Bt)	metolachlor
copper compounds	metribuzin
dicamba	norflurazon
diquat	potassium salts
diuron	sethoxydim
EPTC	sulfur
fluazifop-p-butyl	simazine

B. The following lists include some of the most commonly used pesticides in South Florida that are thought to be hazardous to fish and wildlife. These chemicals are approved for application during the interim use period with the following restriction: Use of these chemicals should be discontinued for the indicated time period prior to flooding agricultural lands for wetland restoration, creating water retention reservoirs, or any other activity likely to attract fish and wildlife to the site.

Use of the following should be **discontinued at least 3 months** prior to flooding:

acephate	malathion
alachlor	methidathion
diazinon	methyl parathion
dimethoate	oxamyl
	trichlorfon

Use of the following should be **discontinued at least 6 months** prior to flooding:

aldicarb	ethoprop
azinphos-methyl	ethyl parathion
carbaryl	permethrin
carbofuran	phorate
chlorpyrifos	terbufos

Use of the following should be **discontinued at least 1 year** prior to flooding:

atrazine	esfenvalerate
cyfluthrin	fenamiphos
disulfoton	fonofos
endosulfan	

Use of the following should be **discontinued at least 2 years** prior to flooding:

dicofol	trifluralin

C. Due to their high toxicity and/or extreme persistence in the environment, the following chemicals **should not be applied** during the interim use period to lands being acquired for wetland restoration, water retention, or similar purposes. Interim uses which require these chemicals will not be permitted.

benomyl	paraquat

D. Other pesticides which do not appear on the above lists may come up from time to time. These will be evaluated on a chemical-by-chemical basis and added to the appropriate category above.

E. *Any* pesticide, regardless of the above categories, shown to already be present in soil at or above the appropriate sediment guideline, may require additional restrictions. For example, copper is a metal which does not degrade in the environment and may already be present in some soils (e.g., orchards) at levels above the Florida Department of Environmental Protection's Sediment Quality Assessment Guideline (MacDonald, 1994). In this case, further use of copper compounds during the interim use period would have to be reduced or eliminated altogether. These situations will be evaluated on a case-by-case basis. Add: cmt push over SQAGs.

IV. SOURCES OF INFORMATION

A. Publications

Casarett, L.J., M.O. Amdur and C.D. Klaasen (eds.). 1996. Casarett and Doull's Toxicology: The Basic Science of Poisons, 5th Edition. McGraw Hill.

1997 Farm Chemicals Handbook (Vol. 83). Meister Publishing Co., Willoughby, Ohio.

MacDonald, D.D. 1994. Approach to the Assessment of Sediment Quality in Florida Coastal Waters. Florida Department of Environmental Protection, Office of Water Policy, Tallahassee, Florida.

Milne, G.W.A. 1995. CRC Handbook of Pesticides. CRC Press, Boca Raton, Florida. 402 pp.

Shahane, A.H. 1999. Summary of Agricultural Pesticide Usage in Florida: 1995-98. Florida Department of Agriculture and Consumer Services, Tallahassee, Florida. 111 pp.

B. Online Databases

Environmental Fate Database, Syracuse Research Corporation, Syracuse, New York. http://esc.syrres.com/efdb.htm

Hazardous Substances Data Bank (HSDB), TOXNET, National Library of Medicine, Washington, D.C. http://toxnet.nlm.nih.gov/

Extension Toxicology Network (EXTOXNET), Oregon State University, Corvallis, Oregon. http://ace.orst.edu/info/extoxnet/ -

Table 1. Environmental and Toxicological Characteristics of Pecticides Considered in Establishing the No Application Period.

Pesticide	No Application	$T_{1/2}$ soil (days)		Persistence	5 X $T_{1/2}$	Class	Bird Kills?[1]	LD50 (rat, oral)	LC50 (fish)
	Period	median	max		(months)			mg/kg	mg/l
acephate	3 mo.	3	14		0.5	OP	YES	866 - 945	>1000
alachlor	3 mo.	14	133	6 wk - >1 yr	2.3	acetanilide		930 - 1350	(3.7)
aldicarb	6 mo.	19	990	1 - 15 d	3.2	carbamate	YES	1	1.5
atrazine	1 yr.	63.8	1898	73 d - 2 yr	10.6	triazine		1780	slightly toxic
azinphos-methyl	6 mo.	37.0	484		6.2	OP	YES	4.4 - 16	0.003
benomyl	Do Not Apply	270	360	15 d - 4 wk	45.0	carbamate		>10,000	.006 - 14
carbaryl	6 mo.	25.5	379.4	40 d	4.3	carbamate		246 - 283	28
carbofuran	6 mo.	29	334.2	56 d - 14.5 mo	4.8	carbamate	YES	8	0.24
chlorpyrifos	6 mo.	22.6	84		3.8	OP	YES	96 - 270	0.18
cyfluthrin	1 yr.	56.0	63.0		9.3	pyrethroid			.00068 - .022
diazinon	3 mo.	11.5	35	3 - 14 wk	1.9	OP	YES	1250	toxic
dicofol	2 yr.	60		>1 yr	10.0	OC		570 - 595	0.12 - 0.37
dimethoate	3 mo.	11	122		1.8	OP	YES	235	30.2
disulfoton	1 yr.	5.6	70.0	56 d - 2 yr	0.9	OP	YES	1.9 - 12.5	0.038
endosulfan	1 yr.	40.5	150	10 - 160 d	6.7	OC	YES	18 - 160	0.001
esfenvalerate	1 yr.	52.5	90		8.8	pyrethroid		458	.0002 - .001
ethoprop	6 mo.	19.5	84		3.3	OP	YES	61.5	
ethyl parathion	6 mo.	22	2957.2	20 d - >16 yr	3.7	OP	YES	2	1.5
fenamiphos	1 yr.	43.5	470.2	92 d	7.3	OP	YES	2 - 19	0.11 - 9.6
fonofos	1 yr.	42.5	93.3		7.1	OP	YES	8 - 17.5	0.05
malathion	3 mo.	1.7	6.0		0.3	OP		5500	200
methamidophos	3 mo.	4.8	12.0		0.8	OP	YES	16 - 21	25 - 100
methidathion	3 mo.	7.0	23.0		1.2	OP		25 - 54	.002 - .014
methyl parathion	3 mo.	15.0	915.6	3 - 5 mo.	2.5	OP	YES	6 - 50	1.9 - 8.9
oxamyl	3 mo.	12.5	50		2.1	carbamate	YES	5.4	4.2 - 17.5
paraquat	Do Not Apply	1000	2409		166.7	bipyridyl		150	13 - 32
permethrin	6 mo.	34	38		5.7	pyrethroid		430 - 4000	.0018 - .0054
phorate	6 mo.	23.3	167.6	2 wk - 4.5 mo	3.9	OP	YES	2 - 4	0.002
propargite (omite)	no data					??		1480 - 2200	.031 - .100
terbufos	6 mo.	19.5	151.8		3.2	OP	YES	1.3 - 1.6	.001 - .39
trichlorfon	3 mo.	0.97	140	8 d - 1.5 mo.	0.2	OP		450 - 650	.26 - 2.5
trifluralin	2 yr.	88.2	405	157 d - >40 wk	14.7	dinitroaniline		>10,000	.02 - 3.4

[1]YES in this column indicates pesticides that have caused documented die-offs of migratory birds.

Appendix A. Reported Soil Half-Lives (in days) for South Florida Pesticides.*

alachlor	aldicarb	atrazine	azinphos-methyl	benomyl	carbaryl	carbofuran	chlorpyrifos	cyfluthrin	diazinon	dicofol	dimethoate	disulfoton	endosulfan
Lit. $T_{1/2}$ (d)	Lit. $T_{1/2}$ (d)	Lit. $T_{1/2}$ (d)	Lit. $T_{1/2}$ (d)	Lit. $T_{1/2}$ (d)	Lit. $T_{1/2}$ (d)	Lit. $T_{1/2}$ (d)	Lit. $T_{1/2}$ (d)	Lit. $T_{1/2}$ (d)	Lit. $T_{1/2}$ (d)	Lit. $T_{1/2}$ (d)	Lit. $T_{1/2}$ (d)	Lit. $T_{1/2}$ (d)	Lit. $T_{1/2}$ (d)
15	9.9	15	5	180	22	26	81	56	7	60	2.5	1	32
7	23	300	484	360	12	110	28	63	14		4	4	150
14	990	1898	21		25.5	14	84	Calc. $T_{1/2}$	35		122	7	39
4	7	53	68		8	28	7	42.1	11.5		7	56	42
49	12	113	10		12	60	18		6.3		11	70	Calc. $T_{1/2}$
7.8	23	28	30		Calc. $T_{1/2}$	75	11.5				29	Calc. $T_{1/2}$	42.0
Calc. $T_{1/2}$	2	181	Calc. $T_{1/2}$		379.4	30	25.1				36	4.3	24.2
133.3	15	115	44.0		195.2	60	8.7				Calc. $T_{1/2}$	3.1	
	54	48	51.3		51.7	28	Calc. $T_{1/2}$				6.6	10.5	
	20	357			43.8	43	20.1				53.1		
	46	78				53	30.0						
	18	20				8							
	154	58				10							
	60	67				14							
	9	Calc. $T_{1/2}$				73							
	12	84.0				Calc. $T_{1/2}$							
	20	48.3				9.7							
	361	20.0				2.8							
	Calc. $T_{1/2}$	10.0				334.2							
	8.9	48.3				113.4							
	2.0	127.5				22.6							
		56.7											
		26.4											
		134.3											
		279.9											
		149.9											
		36.5											
		89.7											
		23.4											
		92.3											
		60.6											

*Values were taken directly from the literature or calculated from degradation rates.

Appendix A. Reported Soil Half-Lives (in days) for South Florida Pesticides.*

esfenvalerate	ethoprop	ethyl parathion	fenamiphos	fonophos	malathion	methamidophos	methidathion	methyl parathion	oxamyl	paraquat	permethrin	phorate
Lit. $T_{1/2}$ (d)	Lit. $T_{1/2}$ (d)	Lit. $T_{1/2}$ (d)	Lit. $T_{1/2}$ (d)	Lit. $T_{1/2}$ (d)	Lit. $T_{1/2}$ (d)	Lit. $T_{1/2}$ (d)	Lit. $T_{1/2}$ (d)	Lit. $T_{1/2}$ (d)	Lit. $T_{1/2}$ (d)	Lit. $T_{1/2}$ (d)	Lit. $T_{1/2}$ (d)	Lit. $T_{1/2}$ (d)
15	25	7	50	40	1	1.9	5	4	11	1000	30	82
90	3	11	2.1	30	6	4.8	7	45	15	2409	38	2
	56	112	4	45	Calc. $T_{1/2}$	6.1	23	10	6	Calc. $T_{1/2}$		6
	14	182	11	18	4.3	12		15	14	268.7		30
	84	22	Calc. $T_{1/2}$	82	2.3	Calc. $T_{1/2}$		Calc. $T_{1/2}$	4			69
	12	23	13.1	Calc. $T_{1/2}$	1.0	2.7		4.3	33			Calc. $T_{1/2}$
	16	Calc. $T_{1/2}$	138.2	93.3	0.3			915.6	8			167.6
	73	12.1	462.8	75.0				203.1	50			23.3
	Calc. $T_{1/2}$	34.2	470.2	28.5								7.5
	23.0	2.4	43.5									98.2
	12.6	4.9										20.8
		16.2										1.6
		131.5										
		20.0										
		2957.2										
		224.9										

*Values were taken directly from the literature or calculated from degradation rates.

Appendix A. Reported Soil Half-Lives (in days) for South Florida Pesticides.*

terbufos	trichlorfon	trifluralin
Lit. $T_{1/2}$ (d)	Lit. $T_{1/2}$ (d)	Lit. $T_{1/2}$ (d)
5	1.1	38
22	140	61
16.9	0.6	211
86.6	0.8	405
12.8		Calc. $T_{1/2}$
66.5		66.7
10		109.8
4.5		
Calc. $T_{1/2}$		
22.5		
12.1		
151.8		
97.8		

*Values were taken directly from the literature or calculated from degradation rates.

Appendix B. Half-life Calculation Worksheet.

Atrazine	Lit. $T_{1/2}$	units	$T_{1/2}$ (days)	% degraded	time	units	Calc. $T_{1/2}$	$T_{1/2}$ (days)
	0.5	mo	15	50	12	wk	12.0	84.0
	10	mo	300	70	12	wk	6.9	48.3
	5.2	yr	1898	50	20	d	20.0	20.0
	53	d	53	75	20	d	10.0	10.0
	113	d	113	70	12	wk	6.9	48.3
	28	d	28	29	9	wk	18.2	127.5
	181	d	181	60	75	d	56.7	56.7
	115	d	115	86	75	d	26.4	26.4
	48	d	48	71	8	mo	4.5	134.3
	357	d	357	13.8	60	d	279.9	279.9
	78	d	78	75	10	mo	5.0	149.9
	20	d	20	85	100	d	36.5	36.5
	58	d	58	90	298	d	89.7	89.7
	67	d	67	93	3	mo	0.8	23.4
				86	262	d	92.3	92.3
				95	262	d	60.6	60.6

Trichlorfon	Lit. $T_{1/2}$	units	$T_{1/2}$ (days)	Aldicarb	K_{el}	units	Calc. $T_{1/2}$
	1.1	d	1.1		0.078	d^{-1}	8.9
	140	d	140		0.35	d^{-1}	2.0
	14	hr	0.6				
	20	hr	0.8				

Phorate	Lit. $T_{1/2}$	units	% degraded	time	units	Calc. $T_{1/2}$
	82	d	18	48	d	167.6
	2	d	76	48	d	23.3
	6	d	90	25	d	7.5
	30	d	47	90	d	98.2
	69	d	95	90	d	20.8
			95	7	d	1.6

Carbaryl	Lit. $T_{1/2}$	units	% degraded	time	units	Calc. $T_{1/2}$	$T_{1/2}$ (days)
	22	d	12	10	wk	54.2	379.4
	12	d	22	10	wk	27.9	195.2
	25.5	d	80	120	d	51.7	51.7
	8	d	85	120	d	43.8	43.8
	12	d					

Methyl Parathion	Lit. $T_{1/2}$	units	% degraded	time	units	Calc. $T_{1/2}$	$T_{1/2}$ (days)
	4	d	99.5	33	d	4.3	4.3
	45	d	64	45	mo	30.5	915.6
	10	d	99	45	mo	6.8	203.1
	15	d					

Appendix B. Half-life Calculation Worksheet.

Alachlor	% degraded	time	units	Calc. $T_{1/2}$	$T_{1/2}$ (days)
	85	1	yr	0.4	133.3
Carbofuran	% degraded	time	units	Calc. $T_{1/2}$	$T_{1/2}$ (days)
	95	42	d	9.7	9.7
	97	14	d	2.8	2.8
	7	5	wk	47.7	334.2
	60	5	mo	3.8	113.4
	99	5	mo	0.8	22.6
Chlorpyrifos	% degraded	time	units	Calc. $T_{1/2}$	$T_{1/2}$ (days)
	62	4	wk	2.9	20.1
	50	30	d	30.0	30.0
Cyfluthrin	% degraded	time	units	Calc. $T_{1/2}$	$T_{1/2}$ (days)
	90	140	d	42.1	42.1
Dimethoate	% degraded	time	units	Calc. $T_{1/2}$	$T_{1/2}$ (days)
	77	2	wk	0.9	6.6
	98	10	mo	1.8	53.1
Disulfoton	% degraded	time	units	Calc. $T_{1/2}$	$T_{1/2}$ (days)
	68	1	wk	0.6	4.3
	79	1	wk	0.4	3.1
	90	5	wk	1.5	10.5
Endosulfan	% degraded	time	units	Calc. $T_{1/2}$	$T_{1/2}$ (days)
	50	42	d	42.0	42.0
	70	42	d	24.2	24.2
Ethoprop	% degraded	time	units	Calc. $T_{1/2}$	$T_{1/2}$ (days)
	19	1	wk	3.3	23.0
	32	1	wk	1.8	12.6
Ethyl parathion	% degraded	time	units	Calc. $T_{1/2}$	$T_{1/2}$ (days)
	96	8	wk	1.7	12.1
	20	11	d	34.2	34.2
	96	11	d	2.4	2.4
	95	3	wk	0.7	4.9
	95	10	wk	2.3	16.2
	10	20	d	131.5	131.5
	50	20	d	20.0	20.0
	3	130	d	2957.2	2957.2
	33	130	d	224.9	224.9

Appendix B. Half-life Calculation Worksheet.

Fonophos	% degraded	time	units	Calc. $T_{1/2}$	$T_{1/2}$ (days)
	59	4	mo	3.1	93.3
	67	4	mo	2.5	75.0
	64	6	wk	4.1	28.5

Malathion	% degraded	time	units	Calc. $T_{1/2}$	$T_{1/2}$ (days)
	80	10	d	4.3	4.3
	95	10	d	2.3	2.3
	50	24	hr	24.0	1.0
	90	24	hr	7.2	0.3

Paraquat	% degraded	time	units	Calc. $T_{1/2}$	$T_{1/2}$ (days)
	13	54	d	268.7	268.7

Terbufos	% degraded	time	units	Calc. $T_{1/2}$	$T_{1/2}$ (days)
	35	14	d	22.5	22.5
	80	28	d	12.1	12.1
	12	4	wk	21.7	151.8
	18	4	wk	14.0	97.8

Trifluralin	% degraded	time	units	Calc. $T_{1/2}$	$T_{1/2}$ (days)
	85	0.5	yr	0.18	66.7
	90	1	yr	0.30	109.8

Fenamiphos	% degraded	time	units	Calc. $T_{1/2}$	$T_{1/2}$ (days)
	94.6	55	d	13.1	13.1
	24.1	55	d	138.2	138.2
	9	63	d	462.8	462.8
	9.8	70	d	470.2	470.2
	67.2	70	d	43.5	43.5

Azinphos-methyl	% degraded	time	units	Calc. $T_{1/2}$	$T_{1/2}$ (days)
	50	44	d	44.0	44.0
	93	197	d	51.3	51.3

Methamido-phos	% degraded	time	units	Calc. $T_{1/2}$	$T_{1/2}$ (days)
	92	10	d	2.7	2.7

APPENDIX B

APPENDIX B
Best Management Practice Checklist

United States Sugar Corporation
Hendry County
State of Florida

Best Management Practices (BMP) Site Verification Checklist

Tract No.:
SFWMD Representative(s):
Property Representative(s):
Inspection Date:

BMP	Description/Comment	Implementation Verified	Additional Attention Required
Property Use and Structures			
Housekeeping			
General Site -			
Storage Areas -			
Additional Observations -			
Employee Training			
Schedule -			

Topics -			
Additional Observations -			
Hazardous Material/ Chemical Use			
Chemicals Used -			
Application Type -			
Application Schedule -			
Material Records -			
Additional Observations:			
Petroleum Products			
Product Use -			
Pump Station(s) -			
Storage Location(s) -			
Additional Observations:			
Chemical Storage			
Storage Location -			
Building/Area Type -			

Pump Station(s) -			
Additional Observations:			
Mixing & Loading Areas			
Area Description -			
Area Observations -			
Additional Observations:			
Waste Storage and Disposal			
Waste Types -			
Storage Location -			
Waste Disposal -			
Waste Disposal Records -			
Additional Observations:			
Water Management			
Observations -			
Water Mgmt Controls -			
Weather Monitoring -			
Additional Observations:			

Erosion/Sediment Controls			
Erosion Controls -			
Sediment Controls -			
Additional Observations:			
Exotic Vegetation Management			
Observations -			
Physical Controls -			
Biological Controls -			
Chemical Controls -			
Additional Observations:			
General Field Notes			

Notes:

N/A - Not Applicable

APPENDIX C

APPENDIX C
EMERGENCY RESPONSE and CHEMICAL HAZARD INFORMATION PHONE NUMBERS

EMERGENCY REPORTING

For Ambulance, Fire, or Police **Dial 911**

State Warning Point (Department of Community Affairs, Division of Emergency Management)	24hrs. Toll Free 1-800-320-0519 or (850) 413-9911
National Response Center	24hrs. Toll Free 1-800-424-8802

(Federal law requires that anyone who releases into the environment a reportable quantity of a hazardous substance [including oil when water is or may be affected] or a material identified as a marine pollutant, must immediately notify the NRC).

FDEP Emergency Response, 24 hrs. Toll Free **1-800-342-5367**

HELP LINE NUMBERS

Chemical hazard information and regulatory questions

• **CHEMTREC HOT LINE (Emergency only) 24 hrs**	Toll Free 1-800-424-9300
• SARA Title III help line	Toll Free 1-800-535-0202
• CERCLA / RCRA help line	Toll Free 1-800-424-9346
• Pesticide Container Recycling Program Pesticide Information Officer at University of Florida	352-392-4721

COUNTY COOPERATIVE EXTENSION OFFICES

Pam Beach County	559 N. Military Trail West Palm Beach, FL 33415	(561) 233-1700
Hendry County	1085 Pratt Boulevard Dallas B Townsend Agricultural Center Labelle, FL 33935	(863) 674-4092
Glades County	900 US Highway 27 SW Moore Haven, FL 33471	(863) 946-0244
Gilchrist County	125 East Wade Street Trenton, FL 32693	(352) 463-3174

STATE OF FLORIDA AGENCIES

Florida Department of Agriculture and Consumer Services

Bureau of Pesticides	(850) 487-0532
Bureau of Compliance Monitoring	(850) 488-3314
Division of Agriculture and Environmental Services	(850) 488-3731

Florida Department of Environmental Protection

FDEP Stormwater/Nonpoint Source Management Section (Tallahassee)	(850) 488-3605
FDEP Hazardous Waste Management Section (Tallahassee)	(850) 488-0300
FDEP District offices - West Palm Beach	(561) 681-6800

Florida Fish and Wildlife Conservation Commission

620 South Meridian Street Tallahassee, FL 32301	(850) 488-4066 or (850) 488-4069

Water Management Districts

South Florida Water Management District (West Palm Beach)	(561) 686-8800 or 1-800-432-2045

University of Florida (Gainesville)

Pesticide Information Office	(352) 392-4721
Agricultural Law Policy Office	(352) 392-1881

UNITED STATES AGENCIES

EPA National Offices & Numbers

Office of Water 4604, 401 M Street, SW Washington, DC 20460 (Provides Information on Clean Water Act and related water pollution regulations)	(202)-382-5700

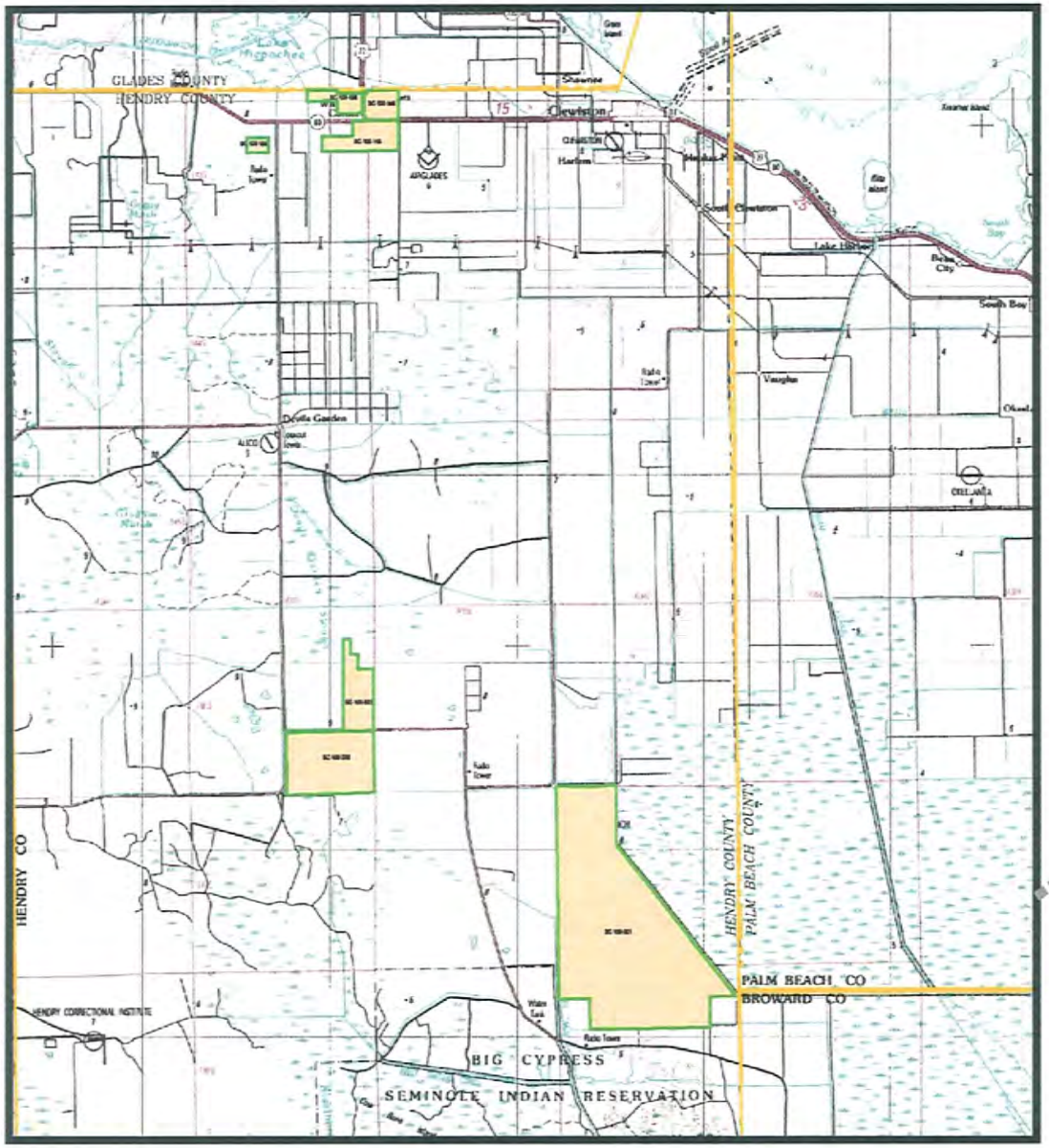
Florida Administrator of EPA Pesticide Registration

Bureau of Pesticides/ Division of Inspection Dept. of Agriculture and Consumer Services 3125 Conner Blvd., MD-2 Tallahassee, FL 32399-1650	(850) 487-2130

National Pesticide Telecommunications Network

Provides information on pesticides and pesticide poisonings. Operating 24 hours a day, 365 days a year.	1-800-858-7378

FIGURE 1



- PARCELS USED FOR CULTIVATION OF CITRUS

UNITED STATES SUGAR CORPORATION
111 PONCE DE LEON AVENUE
CLEWISTON, FL.

JOB NO.: 38617-027 DATE: SEPTEMBER 2008

CITRUS PARCEL LOCATION VICINITY MAP

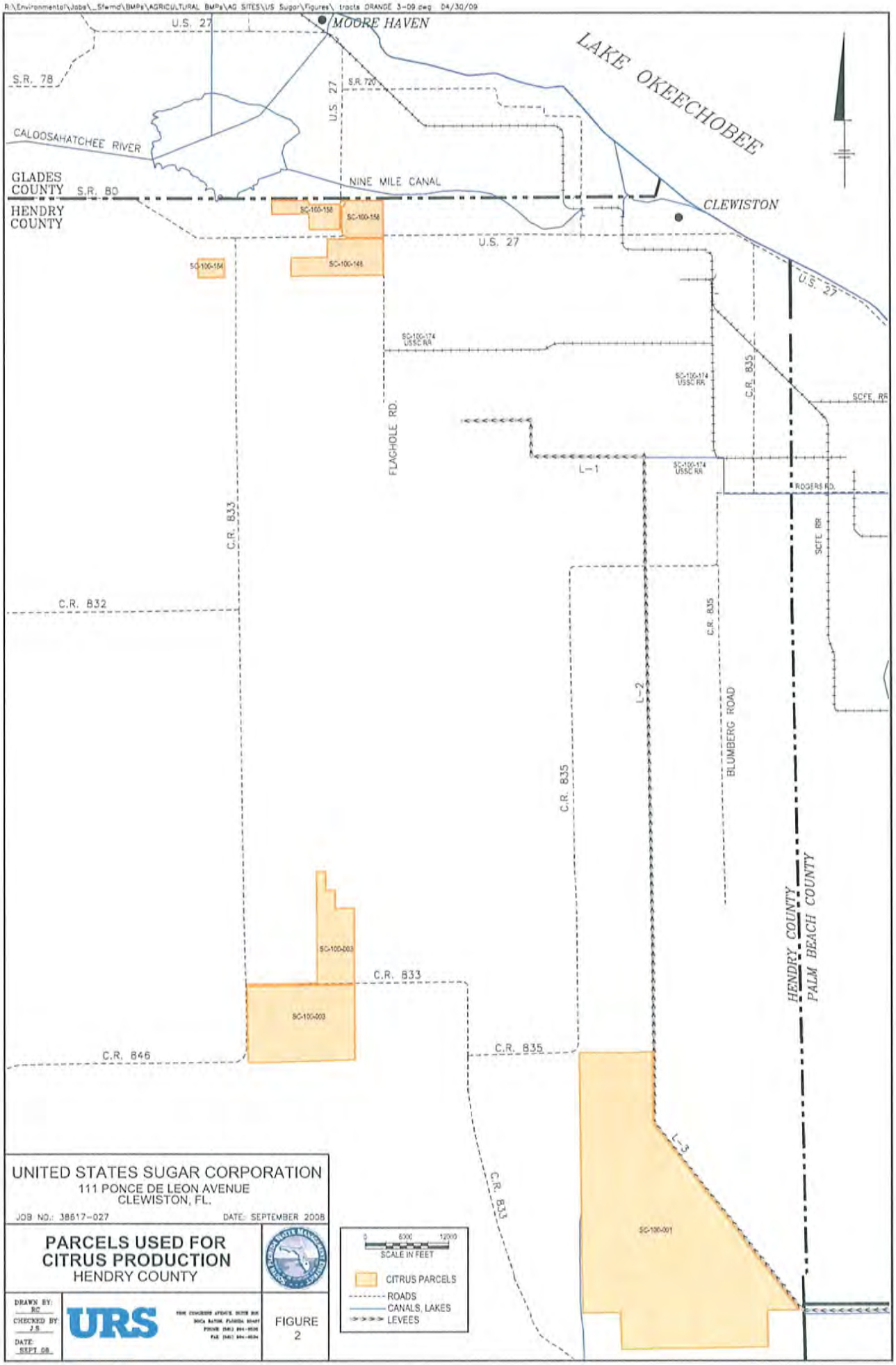
DRAWN BY: MC
CHECKED BY: J.S.
DATE: DEC 08

URS

FIGURE 1

R:\Environmental\Jobs\...\Ranch Bufs\AGRICULTURAL Bufs\AG SITES\US Sugar\Figures\ fig2 OC ALL.dwg 05/11/09

FIGURE 2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U.S. 27
MOORE HAVEN
LAKE OKEECHOBEE
S.R. 78
S.R. 720
U.S. 27
CALOOSAHATCHEE RIVER
GLADES COUNTY
S.R. 80
HENDRY COUNTY
NINE MILE CANAL
CLEWISTON
SC-100-158
SC-100-158
SC-100-154
SC-100-148
U.S. 27
U.S. 27
SC-100-174 USSC RR
SC-100-174 USSC RR
C.R. 835
SCFE RR
FLAGHOLE RD.
L-1
SC-100-174 USSC RR
ROGERS RD.
C.R. 833
SCFE RR
C.R. 832
C.R. 835
L-2
BLUMBERG ROAD
C.R. 835
HENDRY COUNTY
PALM BEACH COUNTY
SC-100-003
C.R. 833
SC-100-003
C.R. 846
C.R. 835
L-3
C.R. 833
SC-100-001
UNITED STATES SUGAR CORPORATION
111 PONCE DE LEON AVENUE
CLEWISTON, FL.
JOB NO.: 38617-027
DATE: SEPTEMBER 2008
PARCELS USED FOR CITRUS PRODUCTION
HENDRY COUNTY
0 6000 12000
SCALE IN FEET
CITRUS PARCELS
ROADS
CANALS, LAKES
LEVEES
DRAWN BY: RC
CHECKED BY: TS
DATE: SEPT 08
URS
FIGURE 2