


Effluent Quality Assessment of

# Tampa Port Services, LLC-Port Sutton

Hillsborough County

NPDES # FL0000264

Sampled December 8, 10 and 12, 2014

May 2015

**Biology Section**

**Bureau of Laboratories**

**Division of Environmental Assessment and Restoration**

2014 FDEP Bureau of Laboratories Quality Manual

NELAC Certification No. E31780

**CONTENTS**

**Facility Overview**

**Methods**

**Results**

**Conclusion**

**Literature Cited**

**Tables**

Table 1. Effluent limits, Class III Marine Criteria and field parameters

Table 2. Effluent limits, Class III Marine Criteria and analytical water chemistry data

Table 3. Effluent limits, Class III Marine Criteria and analytical metals data

Table 4. Measured and predicted algal growth potential (AGP; mg dry weight/L) for total soluble inorganic nitrogen (TSIN), ortho-phosphate (OP), total nitrogen (TN) and total phosphorus (TP) limitation and ratios of nitrogen to phosphorus

**Appendices**

Appendix A. Facility Summary

Appendix B. Explanation of measurements

Appendix C. Chemical Analyses of Effluent

**EPA End Sheet**

Tampa Port Services, LLC-Port Sutton, 4873 Port Sutton Road, Tampa, Hillsborough County, Florida, 33619. NPDES #FL0000264.

### Facility Overview

Tampa Port Services, LLC-Port Sutton is a bulk anhydrous ammonia storage facility. See Appendix A for a description of the facility, summary of permit limits, Administrative Order (AO) and Discharge Monitoring Report (DMR) information.

### Methods

Effluent composite samples for toxicity testing were collected on December 8, December 10 and December 12, 2014. Effluent grab samples for biological and chemical analyses for this facility were collected on December 8, 2014. All samples were collected from the EFF-006 NPDES sampling point for Outfall D-006 by Victoria Sowell and Anthony Annibali (FDEP Southwest District) following DEP-SOP-001/01 FS 2400 Wastewater Sampling (see Appendix B).

The 96-hour acute and 7 day chronic definitive toxicity tests and algal growth potential test were performed following internal DEP SOPs TA07_04, TA07_15, and TA08_01 through TA08_09 (see Appendix B).

### Results

#### Chemistry Results (See Table 1, Table 2, Table 3 and Appendix C)

- The total ammonia concentration in the composite sample collected and preserved for chemical analysis was 0.42 mg N/L. Based on the pH, salinity, and temperature of the effluent as collected, the calculated unionized ammonia concentration was <0.02 mg/L.
- Turbidity, fluoride and radium 226 + 228 were detected in the effluent at levels that comply with Class III Marine Water Quality Criteria (62-302.530, F.A.C.). Total suspended solids, aluminum, arsenic and nickel were detected between the laboratory method detection limits (MDL) and practical quantitation limits (PQL).

#### Algal Growth Potential (See Table 4 and Appendix C)

- The effluent Algal Growth Potential (AGP) was 17.2 A mg dry wt/L of the saltwater species *Dunaliella tertiolecta.* Ron Raschke and Don Schultz with USEPA Region 4 determined that AGP values above 10.0 mg dry weight/L, which represents a "problem" threshold for marine receiving waters, imply nutrient enrichment (personal communication, Marshall Faircloth, et. al. FDEP, with Ron Raschke USEPA Region 4 1987).

#### Toxicity Test Results (See Appendix C)

- Tests were performed December 9 - 16, 2014.

| | |
|---|---|
| *Menidia beryllina* 96-hour acute definitive bioassay – | $LC_{50}$ > 100%, 0%* mortality in 100% sample at 96 hours |
| *Menidia beryllina* 7-day chronic definitive bioassay[1] – | No Result – invalidated at 24 hours |
| *Americamysis bahia* 7-day chronic definitive bioassay – | IC25: > 100%<br>NOEC: 100% |

*NOTE: In a 96-hour acute definitive test of 100% effluent, mortality of <20% provides confidence that the effluent meets the acute toxicity criterion of Florida's Surface Water Quality Standards (Rule 62-302.500 (1) (a) 4, F.A.C.). Mortality between 20-50% indicates low to moderate levels of toxicity, and further action may be required. Mortality of >50% indicates that the effluent fails to meet the minimum requirement to discharge to waters of the state (Rule 62-4.244(3) (a), F.A.C.). A 25% inhibition concentration (IC25) is the effluent concentration causing a 25% reduction in a biological response such as biomass or reproduction when compared to a control population. An IC25 of less than 100% in a chronic test may constitute exceedances of 62-302.530(20), 62-302.530(61) and/or facility permit limits. A no

observed effect concentration (NOEC) less than 100% effluent in a chronic test may constitute an exceedance of 62-302.530(61) and/or facility permit limits.

- The bioassay samples were not acutely toxic to the *Menidia beryllina* test organisms or acutely or chronically toxic to the *Americamysis bahia* test organisms.

[1]The *Menidia beryllina* chronic bioassay was invalidated at 24 hours due to excessive control mortality. After consultation with SW District personnel, an acute definitive test was performed.

**Conclusion**

The effluent samples collected from the EFF-006 NPDES sampling point for this facility on December 8, 10 and 12, 2014, were not acutely toxic to the *Menidia beryllina* test organisms during the 96-hour acute definitive bioassay and were not acutely or chronically toxic to the *Americamysis bahia* test organisms during the 7-day chronic definitive bioassay. The effluent AGP result was greater than the "problem" threshold for marine receiving waters suggesting that nutrient enrichment may be an issue. Effluent water quality samples collected on December 8, 2014, did exceed the applicable water quality standard for dissolved oxygen.

For additional information concerning this sampling event, including bioassay bench sheets and SRT data, please contact Diane.Power@dep.state.fl.us and/or Joseph.Faircloth@dep.state.fl.us.

**Literature Cited**

Raschke, R. L. and D. A. Schultz. 1987. The use of the algal growth potential test for data assessment. J. Wat. Poll. Cont. Fed. 59(4): 222-227.

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Manahan, S. E. 1994. Environmental Chemistry, 6th edition. Lewis Publishers, USA. 811 pp

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USEPA. 2002. Methods for measuring the acute toxicity of effluents to freshwater and marine organisms. 5th edition. EPA-821-R-02-012.

USEPA. 2002. Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Marine and Estuarine Organisms. 5th edition. EPA-821-R-02-014.

USEPA. 2000. Nutrient Criteria Technical Guidance Manual – River and Streams. EPA-822-B-00-002.

**Table 1. Effluent limits, Class III Marine Criteria and field parameters.**

| Tampa Port Services, LLC-Port Sutton | Units | Class III Criteria | Effluent Permit Limits | Outfall Tox Comp 12/8/2014 | Outfall Grab 11:44 12/8/2014 |
|---|---|---|---|---|---|
| Sample Depth | m | - | - | 0.1 | 0.1 |
| Temperature | C | - | Report | 22.46 | 22.46 |
| pH | SU | 6.5 - 8.5 | 6.5 - 8.5 | 7.24 | 7.24 |
| Specific Conductance | umhos/cm | - | Report | 37308 | 37308 |
| Salinity | ppth | - | - | 25 c | 25 c |
| Dissolved Oxygen | % saturation | ≥ 42 [1] | - | 60.28 c | 60.28 c |
| Dissolved Oxygen | mg/L | ≥ 3.15 [2] | ≥ 4.0 | 4.52 | 4.52 |
| Flow (12/1/2013-11/30/2014) | MGD | - | Report | - | 2.48 a |
| Total Residual Chlorine | mg/L | ≤ 0.01 | - | <0.03 Ud | - |

A dash (-) indicates sample/measurement was not collected or criterion/limit does not exist.

1 - The daily average percent DO saturation shall not be below 42 percent saturation in more than 10 percent of values

2 - 42 percent (3.15 mg/L) of effluent DO saturation (7.5 mg/L) based on temperature and salinity

a - Annual average

c - Value is calculated

d - Measurement taken in the FDEP laboratory

e - Value exceeds the Class III Water Quality Criteria or permit limits

U - Material analyzed for but not detected; value reported is the method detection limit

**Table 2. Effluent limits, Class III Marine Criteria and analytical water chemistry data.**

| Tampa Port Services, LLC-Port Sutton | Units | Class III Criteria | Effluent Permit Limits | Outfall Tox Comp 12/8/2014 | Field Blank Grab 12/8/2014 | Outfall Grab 11:44 12/8/2014 |
|---|---|---|---|---|---|---|
| Ortho-phosphate | mg P/L | - | - | - | 0.004 U | 0.13 |
| Total Phosphorus | mg P/L | - | Report | - | 0.002 U | 0.13 |
| Total Ammonia | mg N/L | - | - | - | 0.002 U | 0.42 |
| Un-ionized Ammonia (calculated salinity) | mg NH3/L | - | Report | - | - | < 0.02 c |
| Nitrate and Nitrite | mg N/L | - | - | - | 0.004 U | 0.040 |
| Total Kjeldahl Nitrogen | mg N/L | - | - | - | 0.080 U | 0.77 |
| Organic Nitrogen | mg N/L | - | - | - | 0.039 c | 0.35 c |
| Total Nitrogen | mg N/L | - | Report | - | 0.042 c | 0.81 c |
| Total Organic Carbon | mg C/L | - | - | - | 0.50 U | 4.7 |
| Chlorophyll *a* - Corrected | ug/L | - | - | - | - | 3.2 |
| Phaeophytin | ug/L | - | - | - | - | 1.0 I |
| CBOD, 5 day, N - inhibited | mg/L | - | - | - | - | 1.2 IJ [3] |
| Total Suspended Solids | mg/L | - | Report | - | - | 4 I [3] |
| Turbidity | NTU | < 29 t | < 29 t | - | 0.10 U | 1.4 |
| Color (true) | PCU | - | - | - | 2.5 U | 8.9 |
| Alkalinity | mg CaCO3/L | - | - | - | 0.65 U | 112 |
| Chloride | mg Cl/L | - | - | - | 0.20 U | 13000 |
| Fluoride | mg F/L | ≤ 5.0 | ≤ 5.0 | - | - | 1.1 [3] |
| Sulfate | mg SO4/L | - | - | - | 0.20 U | 1900 |
| Radium 226 | pCi/L | - | - | - | 0.367 U | 0.916 J |
| Radium 226-Counting Error | pCi/L | - | - | - | 0.140 | 0.260 |
| Radium 228 | pCi/L | - | - | - | 0.5 U | 0.753 J |
| Radium 228-Counting Error | pCi/L | - | - | - | 0.160 | 0.260 |
| Radium 226 + 228 | pCi/L | ≤ 5.0 | - | - | 0 c | 1.669 cJ |
| **Toxicity (Chronic Definitive, IC25)** | | | | | | |
| Bioassay - Mysid *(Americamysis bahia)* | % | ≥ 100 | ≥ 100 | >100 | - | - |
| Bioassay - Fish *(Menidia beryllina)* | % | ≥ 100 | ≥ 100 | No Result O | - | - |
| **Toxicity (Acute Definitive, percent mortality in 100% sample, LC50)** | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| Bioassay - Fish *(Menidia beryllina)* | % | ≥ 100 | ≥ 100 | >100 | - | - |

A dash (-) indicates sample/measurement was not collected or criterion/limit does not exist.

3 - Value is the result of a grab sample collected for Suite B

e - Value exceeds the Class III Water Quality Criteria or permit limits

c - Value is calculated

t - Shall not exceed 29 NTUs above background

I - The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit

J - Estimated value

O - Sampled, but analysis lost or not performed

U - Material analyzed for but not detected; value reported is the method detection limit

**Table 3. Effluent limits, Class III Marine Criteria and analytical metals data**

| Tampa Port Services, LLC-Port Sutton | Units | Class III Criteria | Effluent Permit Limits | Outfall Grab 12/8/2014 |
|---|---|---|---|---|
| Aluminum | ug/L | ≤ 1500 | - | 55 I |
| Arsenic | ug/L | ≤ 50 | - | 2.4 I |
| Cadmium | ug/L | ≤ 8.8 | - | 0.15 U |
| Calcium | mg/L | - | - | 277 |
| Chromium, Total [4] | ug/L | ≤ 50 | - | 0.90 U |
| Copper | ug/L | ≤ 3.7 | - | 1.5 U |
| Iron | ug/L | ≤ 300 | - | 90 U |
| Lead | ug/L | ≤ 8.5 | - | 0.60 U |
| Magnesium | mg/L | - | - | 876 |
| Nickel | ug/L | ≤ 8.3 | - | 0.99 I |
| Potassium | mg/L | - | - | 260 |
| Selenium | ug/L | ≤ 71 | - | 0.60 U |
| Silver | ug/L | ≤ 2.3 | - | 0.075 U |
| Sodium | mg/L | - | - | 7220 |
| Zinc | ug/L | ≤ 86 | - | 15 U |

A dash (-) indicates sample/measurement was not collected or criterion/limit does not exist.
4 - Class III Marine Water Quality Criterion (62-302.530(19)(b), F.A.C.) is for chromium-VI
I - The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit
U - Material analyzed for but not detected; value reported is the method detection limit

**Table 4. Measured algal growth potential (AGP; mg dry weight/L) for total soluble inorganic nitrogen (TSIN), ortho-phosphate (OP), total nitrogen (TN) and total phosphorus (TP) limitation and ratios of nitrogen to phosphorus**

| Tampa Port Services, LLC-Port Sutton | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Location** | **Test Species** | **AGP (measured)** | **Predicted AGP (TSIN) ± 20%** | **Predicted AGP (OP) ± 20%** | **Predicted AGP (TN) ± 20%** | **Predicted AGP (TP) ± 20%** | **Inorganic N:P ratio** | **Total N:P ratio** |
| Outfall Grab 12/8/2014 | *Dunaliella tertiolecta* | 17.2 A | not applicable [5] | not applicable [5] | not applicable [5] | not applicable [5] | 3.5 | 6.2 |

5 - Predictions not applicable to marine matrix

A - Value reported is the mean of two or more determinations

**Appendix A**

**Facility Summary**

# State of Florida
# Department of Environmental Protection
# Facility Introduction & Summary

| PART I: Information gathered prior to sampling event | |
|---|---|
| **Prepared By:**<br>**Victoria Sowell** | **Contact Number:**<br>**(813) 470-5749** |
| **Facility Name (as it appears on permit):**<br>**Tampa Port Services, LLC- Port Sutton** | **Former Names:**<br>**IMC Fertilizer, Kinder Morgan** |
| **NPDES Permit Number:**<br>**FL0000264** | **Permit Expiration Date:**<br>**July 6, 2015** |
| **Physical Address:**<br>**4873 Port Sutton Road, Tampa, Florida 33619** | |
| **District: Southwest**<br>**(Phosphate Management Program)** | **County:**<br>**Hillsborough** |
| **Function of Facility:**<br>**Bulk anhydrous ammonia storage facility** | |
| **Facility Type:**<br>**Industrial** | **Permitted Capacity (MGD):** |
| **Mean Flow for previous 12 months for all EXTERNAL outfalls listed in permit (list date range including months):**<br>**2.76 MGD MEAN FLOW for the months of January, February, March, April, June, July, and August 2014** | |
| **If applicable, Mean Flow for previous 12 months for REUSE outfall(s) (list date range including months):**<br>**N/A** | |
| **Description of type of Discharge:**<br>**☒ Continuous ☐ Intermittent ☐ Seasonal ☐ Rainfall Dependent ☐ Other, please specify** | |

| |
|---|
| **Description of Sampling Location(s) - actual permit designation of permitted sampling point(s):**<br>**D-006 (EFF-006) 27°54'16.8224" N, 82°24'33.5172" W** |
| **Description of Permitted Outfall(s):**<br>**Discharges once-through, non-contact heating water, cooling tower blowdown water, and stormwater to Port Sutton Channel (WBID #1637; Class III Marine waters).** |
| **Description of Treatment Process (if multiple discharge points, include a detailed map or diagram of facility):**<br>**Applicant utilizes a surface water intake system, located downstream of the Tampa Electric Company (TECO) Gannon Station's effluent discharge to Port Sutton Channel, which provides a heat source for the ammonia. The intake water is piped to a non-contact heat exchanger where the heating of ammonia takes place. The intake water system consists of a concrete structure, pump with a submerged screened suction pipe, and a discharge pipeline that carries the heated water to the ammonia heat exchangers. In addition, the facility has three compressors that operate to maintain the pressure, temperature, and liquid phase of the stored ammonia. Two of the compressors each have one cooling tower. Cooling tower make up water is a potable source from the City of Tampa, which is injected with a corrosion inhibitor and a biocide to control algae growth. The cooling tower is system is programmed to periodically blowdown a portion of the treated water to a 750-gallon storage tank. The non-contact heating water and the treated cooling tower blowdown water stored in the 750-gallon storage tank are discharged through Outfall D-006 back into Port Sutton Channel.** |

## PART I: Continued

**List <u>current</u> Effluent Limits of Outfall(s) to be Sampled: This should include any AO or CO limits the facility may be under**
**(Leave cell blank if not applicable)**

| | | | Effluent Limitations | | | | Monitoring Requirements | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Parameter | Units | Max/Min | Annual Average | Monthly Average | Weekly Average | Single Sample | Monitoring Frequency | Sample Type | Monitoring Location Site Number | Notes |
| Flow | MGD | Report | Report | Report | | | 1 continuous | Recording Flow Meter with Totalizer | FLW-006 | |
| pH | s.u. | 8.5/6.5 | Report | Report | | | 1 weekly | Instantaneous sample | EFF-006 | |
| Fluoride | mg/L | 5.0 (max) | Report | Report | | | 1 weekly | 24 hour composite | EFF-006 | |
| Ammonia Nitrogen | mg/L | Report | Report | Report | | | 1 weekly | Grab | EFF-006 | |
| Unionized Ammonia (as $NH_3$) | mg/L | Report | Report | Report | | | 1 weekly | Calculation | EFF-006 | |
| Total Nitrogen | mg/L | Report | Report | Report | | | 1 weekly | 24 hour composite | INT-006 & EFF-006 | |
| Total Nitrogen | lbs/day | Report | | Report | | | 1 weekly | Calculation | INT-006 & EFF-006 | |
| Total Phosphorous | mg/L | Report | Report | Report | | | 1 weekly | 24 hour composite | EFF-006 | |
| Total Phosphorous | lbs/day | Report | Report | Report | | | 1 weekly | Calculation | EFF-006 | |
| Dissolved Oxygen | mg/L | 4.0 (min) | Report | 5.0 (min) | | | 1 weekly | Instantaneous | EFF-006 | |
| Specific Conductance | µmhos/cm | Report | Report | Report | | | 1 weekly | Instantaneous | EFF-006 | |
| Water Temperature | Deg. C | Report | Report | Report | | | 1 weekly | Instantaneous | EFF-006 | |
| Total Suspended Solids | mg/L | Report | Report | Report | | | 1 weekly | 24 hour composite | INT-006 EFF-006 | |
| Total Non-volatile, non-filterable residue | mg/L | Report | Report | Report | | | 1 weekly | 24 hour composite | INT-006 EFF-006 | |

## PART I: Continued

**List <u>current</u> Effluent Limits of Outfall(s) to be Sampled: This should include any AO or CO limits the facility may be under**
**(Leave cell blank if not applicable)**

| | | | Effluent Limitations | | | | Monitoring Requirements | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Parameter | Units | Max/Min | Annual Average | Monthly Average | Weekly Average | Single Sample | Monitoring Frequency | Sample Type | Monitoring Location Site Number | Notes |
| Turbidity | NTU | Background + 29 (max) | Report | Report | | | 1 weekly | Grab | EFF-006 | |
| Total Nitrogen | tons/month | Report | Report | Report | | | 1 month | Calculation | EFF-006 | |
| Total Nitrogen, as 12-month loading | tons/year | | 9 | Report | | | 1 month | Calculation | D-006 | 6 tons/year 5-year rolling avg. |
| Whole Effluent Toxicity- Chronic | | 100% (min) | | | | | | 24 hour composite | D-006 | |

## PART I: Continued

| **Receiving Waters:** | **Classification (indicate whether fresh or marine):** |
|---|---|
| **Port Sutton Channel, WBID #1637** | **III Marine** |

**Toxicity Test Requirements (routine and/or additional test language, test species, salinity adjustment, etc.):**

**Chronic Whole Effluent Toxicity; routine testing (conducted semi-annually) with no less than IC25 of 100% in any test. Whole effluent acute toxicity shall not exceed a 96-hour LC50 of less than 100% effluent in any test. All routine tests shall be conducted with a control (0% effluent) and a minimum of five test dilutions: 6.25%, 12.5%, 25%, 50%, and 100%. All test species, procedures and quality assurance criteria used shall be based of the "Short-term methods for estimating the Chronic toxicity of effluents and receiving waters to saltwater organisms", 4th ed. EPA-821-R-02-014, Section 14.12 (*Americamysis bahia*) and Section 13.12 (*Menidia beryllina*).**
**The control water and dilution water used shall be artificial sea salts as described in EPA-821-R-02-014. For the *Americamysis bahia* bioassays, the effluent shall be adjusted to a salinity of 20 ppt. For the *Menidia beryllina* bioassays, the effluent shall be adjusted to 5 ppt.**

**Administrative or Consent Orders (date executed, specific requirements, interim limit dates-if applicable, etc.):**
**Consent Order #90-1832, IMC-Agrico Co. issued January 13, 1994. Case closed May 25, 2012.**

**Facility Mixing Zone Details (if applicable):**
**N/A**

**List Permit Violations (DMR data) and plant upsets that occurred at the plant within the last year: N/A**

| Date | Parameter and Units | Limit | Result |
|---|---|---|---|
| | | | |

**Describe previous FYI and WQBEL study:**

**Describe previous or current Enforcement Actions (including WLs):**

**Describe any violations or problems noted in previous inspection:**

**Discuss whether DMR trends within previous five years are improving or declining:**

| |
|---|
| **Additional Comments (this should include a trend of the Effluent, i.e. if the facility is now Reuse):** |

## PART II: Sampling Event Information

| | |
|---|---|
| **Date(s) sample collected:** | **Sampler(s):** |
| **Temperature (Deg C):** | **pH (SU):** |
| **Dissolved Oxygen (mg/L):** | **Conductivity (umhos/cm):** |
| **Total Residual Chlorine (mg/L):** | **Total Residual Chlorine - after Disinfection (mg/L):** |
| **Method of Chlorination:** | **Method of De-chlorination:** |
| **Flow During Sample Collection for each outfall(MGD):** | |
| **Mean Flow for each outfall for previous 12 months based on sampling date (If samples are taken on more than one day, indicate Mean Flow for each day):** | |
| **Describe Discharge during Sampling Event:** ☐ **Continuous** ☐ **Intermittent** ☐ **Seasonal** ☐ **Rainfall Dependent** ☐ **Other, please specify** | |
| **Describe any conditions, difficulties or abnormal events that occurred during the sample collection and any other additional comments here:** | |

## Appendix B

## Explanation of Measurements

**(1) Quality Assurance and Quality Control**

FDEP's quality assurance requirements for analytical laboratories and field activities are codified in Chapter 62-160, F.A.C., Quality Assurance (QA Rule) and in internal Standard Operating Procedures (FDEP SOPs). Methods for all analyses are on file at the FDEP Central Laboratory in Tallahassee and may be viewed on the web at http://www.dep.state.fl.us/labs/library/lab_sops.htm and/or http://www.dep.state.fl.us/water/sas/sop/sops.htm.

**(2) Chemical Analyses of the Effluent**

The effluent was analyzed for nutrients, metals, organic constituents (base, neutral, and acid extractables) and pesticides following FDEP SOPs. The results from these analyses were compared with Water Quality Criteria (62-302, F.A.C.) and facility permit limits.

**(3) Toxicity Bioassays**

Greater than 50% mortality in an acute toxicity test may constitute an exceedance of 62-302.500(1)a and/or facility permit limits. A 25% inhibition concentration (IC25) is the effluent concentration causing a 25% reduction in a biological response such as biomass or reproduction when compared to a control population. An IC25 of less than 100% in a chronic test may constitute exceedances of 62-302.530(20), 62-302.530(61) and/or facility permit limits. A no observed effect concentration (NOEC) less than 100% effluent in a chronic test may constitute an exceedance of 62-302.530(61) and/or facility permit limits. Standard reference toxicant (SRT) tests are conducted monthly to ensure quality in toxicity testing.

**(4) Chlorophyll *a* Content**

Chlorophyll *a* content is an estimate algal biomass. High algal biomass implies nutrient stress (Stevenson and Bahls 1999) and may constitute exceedances of 62-302.530(46), F.A.C., 62-302.530(47)(a), F.A.C., and/or 62-302.530(47)(b), F.A.C..

**(5) Algal Growth Potential (AGP)**

The algal growth potential (AGP) value is the peak growth of the alga within that 14-day period, recorded as mg dry weight/L. Ron Raschke and Don Shultz (1987) found that an AGP above 10.0 mg dry weight/L represents a "problem" threshold for marine receiving waters, implying nutrient enrichment. High AGP values may constitute exceedances of 62-302.530(46), F.A.C., 62-302.530(47)(a), F.A.C. and/or 62-302.530(47)(b), F.A.C..

The concentration of nutrients in a water sample may be used to calculate the expected yield of AGP in a low salinity sample under the assumption that other required nutrients (e.g. silicon, micronutrients) are present in excess (Miller *et al*. 1978). The expected amount of production is calculated as 38 times the total soluble inorganic nitrogen (nitrate and nitrite plus ammonia) under nitrogen limitation or 430 times the ortho-phosphate (OP) concentration under phosphorus limitation with an error of $\pm$ 20%. When the ratio of nitrogen to phosphorus (N:P) is less than 10:1, nitrogen limitation of algal production is likely. When the N:P ratio is 20:1 or greater, phosphorus limitation is likely (EPA-822-B-00-002). For ratios in-between, co-limitation may occur. Production of lower biomass than expected may be evidence of growth inhibition related to toxic compounds present in the water sample tested and may constitute an exceedance of 62-302.530(61) F.A.C. Expected AGP is not calculated for marine samples incubated with *Dunaliella*.

**(6) Definition of Qualifiers**

A - Value reported is the mean of two or more determinations
B - Results based on colony counts outside the acceptable range.
I - The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.
J - Estimated value
K - Actual value is known to be less than value given
L - Actual value is known to be greater than value given
N - Presumptive evidence of presence of material.

O - Sampled, but analysis lost or not performed.
Q - Sample held beyond normal holding time.
T - Value reported is less than the criterion of detection.
U - Material was analyzed for but not detected. The reported value is the method detection limit for the sample analyzed.
V - Analyte was detected in both sample and method blank.
X - Too few individuals to calculate SCI value.
Y - The laboratory analysis was from an unpreserved or improperly preserved sample. The data may not be accurate
Z - Colonies were too numerous to count (TNTC)

## Appendix C

## Chemical analysis of effluent

| Date Sampled | Field ID | Analysis Group | Component | Result | Units | MDL | PQL |
|---|---|---|---|---|---|---|---|
| 12/8/2014 10:46 | Out Fall D-006 | Chlorophyll/Grain Size/BOD | Biochemical Oxygen Demand-5 Day,N-Inhib | 1.2 IJ | mg/L | 0.2 | 2 |
| 12/8/2014 10:46 | Out Fall D-006 | Nutrients | Kjeldahl Nitrogen | 0.49 | mg N/L | 0.16 | 0.4 |
| 12/8/2014 10:46 | Out Fall D-006 | Nutrients | Total-P | 0.14 | mg P/L | 0.01 | 0.1 |
| 12/8/2014 10:46 | Out Fall D-006 | Nutrients | TSS | 4 I | mg/L | 3 | 10 |
| 12/8/2014 10:46 | Out Fall D-006 | Nutrients | NO2NO3-N | 0.035 | mg N/L | 0.004 | 0.01 |
| 12/8/2014 10:46 | Out Fall D-006 | Nutrients | Ammonia-N | 0.079 | mg N/L | 0.0020 | .005 |
| 12/8/2014 10:46 | Out Fall D-006 | Nutrients | Fluoride | 1.1 | mg F/L | 0.18 | 0.5 |
| 12/8/2014 10:46 | Out Fall D-006 | Nutrients | O-Phosphate-P | 0.13 | mg P/L | 0.04 | 0.1 |
| 12/8/2014 10:46 | Out Fall D-006 | Nutrients | Temperature | 22.46 | C | | |
| 12/8/2014 10:46 | Out Fall D-006 | Nutrients | Dissolved Oxygen | 4.52 | mg/L | | |
| 12/8/2014 10:46 | Out Fall D-006 | Nutrients | Specific Conductance | 37308 | umhos/cm | | |
| 12/8/2014 10:46 | Out Fall D-006 | Nutrients | pH | 7.24 | | | |
| 12/8/2014 10:46 | Out Fall D-006 | Nutrients | Sample Depth | 0.1 | m | | |
| 12/8/2014 10:46 | Out Fall D-006-Toxicity | Toxicology | Bioassay-Chron-Def-SW-Mysid, NOEC | 100 | NOEC | | |
| 12/8/2014 10:46 | Out Fall D-006-Toxicity | Toxicology | Bioassay-Chron-Def-SW-Fish, IC25 | No Result O | IC25 | | |
| 12/8/2014 10:46 | Out Fall D-006-Toxicity | Toxicology | Bioassay-Chron-Def-SW-Fish, NOEC | No Result O | NOEC | | |
| 12/8/2014 10:46 | Out Fall D-006-Toxicity | Toxicology | Bioassay-Chron-Def-SW-Mysid, IC25 | 100 L | IC25 | | |
| 12/8/2014 11:44 | Outfall D-006 | AGP/LN | Algal Growth Potential | 17.2 A | mg DryWt/L | 3 | 3 |
| 12/8/2014 11:44 | Outfall D-006 | Chlorophyll/Grain Size/BOD | Chlorophyll-a, Corrected | 3.2 | ug/L | 0.55 | 1.7 |
| 12/8/2014 11:44 | Outfall D-006 | Chlorophyll/Grain Size/BOD | Phaeophytin-a | 1.0 I | ug/L | 0.4 | 1.2 |
| 12/8/2014 11:44 | Outfall D-006 | Metals | Cadmium | 0.15 U | ug/L | 0.15 | 0.6 |
| 12/8/2014 11:44 | Outfall D-006 | Metals | Nickel | 0.99 I | ug/L | 0.75 | 3 |
| 12/8/2014 11:44 | Outfall D-006 | Metals | Silver | 0.075 U | ug/L | 0.075 | 0.3 |
| 12/8/2014 11:44 | Outfall D-006 | Metals | Selenium | 0.60 U | ug/L | 0.6 | 2.4 |
| 12/8/2014 11:44 | Outfall D-006 | Metals | Chromium | 0.90 U | ug/L | 0.9 | 3.6 |
| 12/8/2014 11:44 | Outfall D-006 | Metals | Sodium | 7.22E+03 | mg/L | 25 | 100 |
| 12/8/2014 11:44 | Outfall D-006 | Metals | Zinc | 15 U | ug/L | 15 | 60 |
| 12/8/2014 11:44 | Outfall D-006 | Metals | Copper | 1.5 U | ug/L | 1.5 | 3 |
| 12/8/2014 11:44 | Outfall D-006 | Metals | Calcium | 277 | mg/L | 0.22 | 0.9 |
| 12/8/2014 11:44 | Outfall D-006 | Metals | Arsenic | 2.4 I | ug/L | 0.75 | 3 |
| 12/8/2014 11:44 | Outfall D-006 | Metals | Lead | 0.60 U | ug/L | 0.6 | 2.4 |
| 12/8/2014 11:44 | Outfall D-006 | Metals | Iron | 90 U | ug/L | 90 | 360 |
| 12/8/2014 11:44 | Outfall D-006 | Metals | Potassium | 260 | mg/L | 15 | 60 |
| 12/8/2014 11:44 | Outfall D-006 | Metals | Magnesium | 876 | mg/L | 2 | 8 |

| Date Sampled | Field ID | Analysis Group | Component | Result | Units | MDL | PQL |
|---|---|---|---|---|---|---|---|
| 12/8/2014 11:44 | Outfall D-006 | Metals | Aluminum | 55 I | ug/L | 15 | 60 |
| 12/8/2014 11:44 | Outfall D-006 | Nutrients | O-Phosphate-P | 0.13 | mg P/L | 0.04 | 0.1 |
| 12/8/2014 11:44 | Outfall D-006 | Nutrients | Ammonia-N | 0.42 | mg N/L | 0.010 | .025 |
| 12/8/2014 11:44 | Outfall D-006 | Nutrients | Chloride | 1.3E+04 | mg Cl/L | 40 | 100 |
| 12/8/2014 11:44 | Outfall D-006 | Nutrients | Color (true) | 8.9 | PCU | 2.5 | 6 |
| 12/8/2014 11:44 | Outfall D-006 | Nutrients | Alkalinity | 112 | mg CaCO3/L | 0.65 | 2.5 |
| 12/8/2014 11:44 | Outfall D-006 | Nutrients | Organic Carbon | 4.7 | mg C/L | 1 | 2 |
| 12/8/2014 11:44 | Outfall D-006 | Nutrients | Total-P | 0.13 | mg P/L | 0.01 | 0.1 |
| 12/8/2014 11:44 | Outfall D-006 | Nutrients | Sulfate | 1.9E+03 | mg SO4/L | 40 | 100 |
| 12/8/2014 11:44 | Outfall D-006 | Nutrients | Kjeldahl Nitrogen | 0.77 | mg N/L | 0.16 | 0.4 |
| 12/8/2014 11:44 | Outfall D-006 | Nutrients | NO2NO3-N | 0.040 | mg N/L | 0.004 | 0.01 |
| 12/8/2014 11:44 | Outfall D-006 | Nutrients | Turbidity | 1.4 | NTU | 0.1 | 0.1 |
| 12/8/2014 11:44 | Outfall D-006 | Overflow | Radium 228 | 0.753 J | pCi/L | 0.4540 | .454 |
| 12/8/2014 11:44 | Outfall D-006 | Overflow | Radium 226 | 0.916 J | pCi/L | 0.3380 | .338 |
| 12/8/2014 11:44 | Outfall D-006 | Overflow | Radium 228-Counting Error | 0.260 | pCi/L | | |
| 12/8/2014 11:44 | Outfall D-006 | Overflow | Radium 226-Counting Error | 0.260 | pCi/L | | |
| 12/8/2014 11:44 | Outfall D-006 | Pesticides | Ethion | 0.010 U | ug/L | 0.01 | 0.04 |
| 12/8/2014 11:44 | Outfall D-006 | Pesticides | Metribuzin | 0.020 U | ug/L | 0.02 | 0.08 |
| 12/8/2014 11:44 | Outfall D-006 | Pesticides | Norflurazon | 0.030 UJ | ug/L | 0.03 | 0.12 |
| 12/8/2014 11:44 | Outfall D-006 | Pesticides | Phorate | 0.0050 U | ug/L | 0.005 | 0.02 |
| 12/8/2014 11:44 | Outfall D-006 | Pesticides | Alachlor | 0.060 U | ug/L | 0.06 | 0.24 |
| 12/8/2014 11:44 | Outfall D-006 | Pesticides | Atrazine Desethyl | 0.010 U | ug/L | 0.01 | 0.04 |
| 12/8/2014 11:44 | Outfall D-006 | Pesticides | Bromacil | 0.040 U | ug/L | 0.04 | 0.16 |
| 12/8/2014 11:44 | Outfall D-006 | Pesticides | Atrazine | 0.027 I | ug/L | 0.01 | 0.04 |
| 12/8/2014 11:44 | Outfall D-006 | Pesticides | Fonofos | 0.010 U | ug/L | 0.01 | 0.04 |
| 12/8/2014 11:44 | Outfall D-006 | Pesticides | Mevinphos | 0.010 U | ug/L | 0.01 | 0.04 |
| 12/8/2014 11:44 | Outfall D-006 | Pesticides | Parathion Methyl | 0.010 U | ug/L | 0.01 | 0.04 |
| 12/8/2014 11:44 | Outfall D-006 | Pesticides | Prometryn | 0.020 U | ug/L | 0.02 | 0.08 |
| 12/8/2014 11:44 | Outfall D-006 | Pesticides | Simazine | 0.010 U | ug/L | 0.01 | 0.04 |
| 12/8/2014 11:44 | Outfall D-006 | Pesticides | Sucralose | 0.52 | ug/L | 0.01 | 0.05 |
| 12/8/2014 11:44 | Outfall D-006 | Pesticides | Diazinon | 0.010 U | ug/L | 0.01 | 0.04 |
| 12/8/2014 11:44 | Outfall D-006 | Pesticides | Metalaxyl | 0.040 UJ | ug/L | 0.04 | 0.16 |
| 12/8/2014 11:44 | Outfall D-006 | Pesticides | Naled | 0.040 UJ | ug/L | 0.04 | 0.16 |
| 12/8/2014 11:44 | Outfall D-006 | Pesticides | Ethoprop | 0.0050 U | ug/L | 0.005 | 0.02 |
| 12/8/2014 11:44 | Outfall D-006 | Pesticides | Malathion | 0.010 U | ug/L | 0.01 | 0.04 |
| 12/8/2014 11:44 | Outfall D-006 | Pesticides | Parathion Ethyl | 0.020 U | ug/L | 0.02 | 0.08 |
| 12/8/2014 11:44 | Outfall D-006 | Pesticides | Ametryn | 0.010 U | ug/L | 0.01 | 0.04 |
| 12/8/2014 11:44 | Outfall D-006 | Pesticides | Atrazine Desisopropyl | 0.010 U | ug/L | 0.01 | 0.04 |
| 12/8/2014 11:44 | Outfall D-006 | Pesticides | Metolachlor | 0.060 U | ug/L | 0.06 | 0.24 |

| Date Sampled | Field ID | Analysis Group | Component | Result | Units | MDL | PQL |
|---|---|---|---|---|---|---|---|
| 12/8/2014 11:44 | Outfall D-006 | Pesticides | Prometon | 0.020 U | ug/L | 0.02 | 0.08 |
| 12/8/2014 11:44 | Outfall D-006 | Pesticides | Butylate | 0.020 U | ug/L | 0.02 | 0.08 |
| 12/8/2014 11:44 | Outfall D-006 | Pesticides | Chlorpyrifos Methyl | 0.010 U | ug/L | 0.01 | 0.04 |
| 12/8/2014 11:44 | Outfall D-006 | Pesticides | Demeton | 0.024 UJ | ug/L | 0.0240 | .096 |
| 12/8/2014 11:44 | Outfall D-006 | Pesticides | Disulfoton | 0.0050 U | ug/L | 0.005 | 0.02 |
| 12/8/2014 11:44 | Outfall D-006 | Pesticides | Fenamiphos | 0.030 U | ug/L | 0.03 | 0.12 |
| 12/8/2014 11:44 | Outfall D-006 | Pesticides | Hexazinone | 0.030 UJ | ug/L | 0.03 | 0.12 |
| 12/8/2014 11:44 | Outfall D-006 | Pesticides | Azinphos Methyl | 0.020 U | ug/L | 0.02 | 0.08 |
| 12/8/2014 11:44 | Outfall D-006 | Pesticides | Chlorpyrifos Ethyl | 0.010 U | ug/L | 0.01 | 0.04 |
| 12/8/2014 11:44 | Outfall D-006 | Priority Organic Pollutants | 2,4-Dinitrotoluene | 1.0 U | ug/L | 1 | 4 |
| 12/8/2014 11:44 | Outfall D-006 | Priority Organic Pollutants | Pyrene | 0.20 U | ug/L | 0.2 | 0.8 |
| 12/8/2014 11:44 | Outfall D-006 | Priority Organic Pollutants | 3,3'-Dichlorobenzidine | 40 U | ug/L | 40 | 160 |
| 12/8/2014 11:44 | Outfall D-006 | Priority Organic Pollutants | 4-Chloro-3-methylphenol | 1.0 U | ug/L | 1 | 4 |
| 12/8/2014 11:44 | Outfall D-006 | Priority Organic Pollutants | 4-Nitrophenol | 15 U | ug/L | 15 | 60 |
| 12/8/2014 11:44 | Outfall D-006 | Priority Organic Pollutants | Acenaphthene | 0.20 U | ug/L | 0.2 | 0.8 |
| 12/8/2014 11:44 | Outfall D-006 | Priority Organic Pollutants | Anthracene | 0.20 U | ug/L | 0.2 | 0.8 |
| 12/8/2014 11:44 | Outfall D-006 | Priority Organic Pollutants | Bis(2-chloroethoxy)methane | 1.0 U | ug/L | 1 | 4 |
| 12/8/2014 11:44 | Outfall D-006 | Priority Organic Pollutants | Bis(2-ethylhexyl)phthalate | 2.0 U | ug/L | 2 | 8 |
| 12/8/2014 11:44 | Outfall D-006 | Priority Organic Pollutants | Isophorone | 1.0 U | ug/L | 1 | 4 |
| 12/8/2014 11:44 | Outfall D-006 | Priority Organic Pollutants | N-Nitrosodimethylamine | 2.0 U | ug/L | 2 | 8 |
| 12/8/2014 11:44 | Outfall D-006 | Priority Organic Pollutants | 2-Methyl-4,6-dinitrophenol | 3.0 U | ug/L | 3 | 12 |
| 12/8/2014 11:44 | Outfall D-006 | Priority Organic Pollutants | Pentachlorophenol | 1.0 U | ug/L | 1 | 4 |
| 12/8/2014 11:44 | Outfall D-006 | Priority Organic Pollutants | Nitrobenzene | 2.0 U | ug/L | 2 | 8 |
| 12/8/2014 11:44 | Outfall D-006 | Priority Organic Pollutants | Benzo(a)pyrene | 0.20 U | ug/L | 0.2 | 0.8 |
| 12/8/2014 11:44 | Outfall D-006 | Priority Organic Pollutants | Hexachlorocyclopentadiene | 3.0 U | ug/L | 3 | 12 |
| 12/8/2014 11:44 | Outfall D-006 | Priority Organic Pollutants | Hexachlorobenzene | 1.0 U | ug/L | 1 | 4 |
| 12/8/2014 11:44 | Outfall D-006 | Priority Organic Pollutants | Dimethyl phthalate | 1.0 U | ug/L | 1 | 4 |
| 12/8/2014 11:44 | Outfall D-006 | Priority Organic Pollutants | 1,2,4-Trichlorobenzene | 1.0 U | ug/L | 1 | 4 |
| 12/8/2014 11:44 | Outfall D-006 | Priority Organic Pollutants | 2,4,6-Trichlorophenol | 1.0 U | ug/L | 1 | 4 |
| 12/8/2014 11:44 | Outfall D-006 | Priority Organic Pollutants | 2,4-Dichlorophenol | 1.0 U | ug/L | 1 | 4 |
| 12/8/2014 11:44 | Outfall D-006 | Priority Organic Pollutants | 2-Nitrophenol | 1.0 U | ug/L | 1 | 4 |
| 12/8/2014 11:44 | Outfall D-006 | Priority Organic Pollutants | Benzo(b)fluoranthene | 0.20 U | ug/L | 0.2 | 0.8 |
| 12/8/2014 11:44 | Outfall D-006 | Priority Organic Pollutants | Hexachlorobutadiene | 3.0 U | ug/L | 3 | 12 |
| 12/8/2014 11:44 | Outfall D-006 | Priority Organic Pollutants | N-Nitrosodiphenylamine/ Diphenylamine | 3.0 U | ug/L | 3 | 12 |
| 12/8/2014 11:44 | Outfall D-006 | Priority Organic Pollutants | Naphthalene | 0.20 U | ug/L | 0.2 | 0.8 |
| 12/8/2014 11:44 | Outfall D-006 | Priority Organic Pollutants | Phenanthrene | 0.20 U | ug/L | 0.2 | 0.8 |
| 12/8/2014 11:44 | Outfall D-006 | Priority Organic Pollutants | 2-Chloronaphthalene | 1.0 U | ug/L | 1 | 4 |
| 12/8/2014 11:44 | Outfall D-006 | Priority Organic Pollutants | Benzo(a)anthracene | 0.20 U | ug/L | 0.2 | 0.8 |
| 12/8/2014 11:44 | Outfall D-006 | Priority Organic Pollutants | Diethyl phthalate | 1.0 U | ug/L | 1 | 4 |

| Date Sampled | Field ID | Analysis Group | Component | Result | Units | MDL | PQL |
|---|---|---|---|---|---|---|---|
| 12/8/2014 11:44 | Outfall D-006 | Priority Organic Pollutants | 2,4-Dimethylphenol | 10 U | ug/L | 10 | 40 |
| 12/8/2014 11:44 | Outfall D-006 | Priority Organic Pollutants | Butyl benzyl phthalate | 1.0 U | ug/L | 1 | 4 |
| 12/8/2014 11:44 | Outfall D-006 | Priority Organic Pollutants | Di-n-butyl phthalate | 1.0 U | ug/L | 1 | 4 |
| 12/8/2014 11:44 | Outfall D-006 | Priority Organic Pollutants | Di-n-octyl phthalate | 1.0 U | ug/L | 1 | 4 |
| 12/8/2014 11:44 | Outfall D-006 | Priority Organic Pollutants | Fluoranthene | 0.20 U | ug/L | 0.2 | 0.8 |
| 12/8/2014 11:44 | Outfall D-006 | Priority Organic Pollutants | N-Nitrosodi-n-propylamine | 2.0 U | ug/L | 2 | 8 |
| 12/8/2014 11:44 | Outfall D-006 | Priority Organic Pollutants | Benzidine | 100 U | ug/L | 100 | 400 |
| 12/8/2014 11:44 | Outfall D-006 | Priority Organic Pollutants | Benzo(k)fluoranthene | 0.20 U | ug/L | 0.2 | 0.8 |
| 12/8/2014 11:44 | Outfall D-006 | Priority Organic Pollutants | Bis(2-chloroethyl)ether | 1.0 U | ug/L | 1 | 4 |
| 12/8/2014 11:44 | Outfall D-006 | Priority Organic Pollutants | Bis(2-chloroisopropyl)ether | 3.0 U | ug/L | 3 | 12 |
| 12/8/2014 11:44 | Outfall D-006 | Priority Organic Pollutants | Chrysene | 0.20 U | ug/L | 0.2 | 0.8 |
| 12/8/2014 11:44 | Outfall D-006 | Priority Organic Pollutants | Fluorene | 0.20 U | ug/L | 0.2 | 0.8 |
| 12/8/2014 11:44 | Outfall D-006 | Priority Organic Pollutants | Hexachloroethane | 3.0 U | ug/L | 3 | 12 |
| 12/8/2014 11:44 | Outfall D-006 | Priority Organic Pollutants | Indeno(1,2,3-cd)pyrene | 0.20 U | ug/L | 0.2 | 0.8 |
| 12/8/2014 11:44 | Outfall D-006 | Priority Organic Pollutants | 2,6-Dinitrotoluene | 1.0 U | ug/L | 1 | 4 |
| 12/8/2014 11:44 | Outfall D-006 | Priority Organic Pollutants | Acenaphthylene | 0.20 U | ug/L | 0.2 | 0.8 |
| 12/8/2014 11:44 | Outfall D-006 | Priority Organic Pollutants | Benzo(g,h,i)perylene | 0.20 U | ug/L | 0.2 | 0.8 |
| 12/8/2014 11:44 | Outfall D-006 | Priority Organic Pollutants | Dibenzo(a,h)anthracene | 0.20 U | ug/L | 0.2 | 0.8 |
| 12/8/2014 11:44 | Outfall D-006 | Priority Organic Pollutants | Phenol | 1.0 U | ug/L | 1 | 4 |
| 12/8/2014 11:44 | Outfall D-006 | Priority Organic Pollutants | 2,4-Dinitrophenol | 15 UJ | ug/L | 15 | 60 |
| 12/8/2014 11:44 | Outfall D-006 | Priority Organic Pollutants | 2-Chlorophenol | 1.0 U | ug/L | 1 | 4 |
| 12/8/2014 11:44 | Outfall D-006 | Priority Organic Pollutants | 4-Bromophenyl phenyl ether | 1.0 U | ug/L | 1 | 4 |
| 12/8/2014 11:44 | Outfall D-006 | Priority Organic Pollutants | 4-Chlorophenyl phenyl ether | 2.0 U | ug/L | 2 | 8 |
| 12/8/2014 11:44 | Outfall D-006 | Nutrients | Specific Conductance | 37308 | umhos/cm | | |
| 12/8/2014 11:44 | Outfall D-006 | Nutrients | pH | 7.24 | | | |
| 12/8/2014 11:44 | Outfall D-006 | Nutrients | Sample Depth | 0.1 | m | | |
| 12/8/2014 11:44 | Outfall D-006 | Nutrients | Dissolved Oxygen | 4.52 | mg/L | | |
| 12/8/2014 11:44 | Outfall D-006 | Nutrients | Temperature | 22.46 | C | | |
| 12/10/2014 11:34 | D-006 OUTFALL | Toxicology | Bioassay-Acute-Def-SW-Fish, LC50 | 100 L | LC50 | | |
| 12/10/2014 11:34 | D-006 OUTFALL | Nutrients | Specific Conductance | 37738 | umhos/cm | | |
| 12/10/2014 11:34 | D-006 OUTFALL | Nutrients | Sample Depth | 0.3 | m | | |
| 12/10/2014 11:34 | D-006 OUTFALL | Nutrients | pH | 7.48 | | | |
| 12/10/2014 11:34 | D-006 OUTFALL | Nutrients | Dissolved Oxygen | 4.34 | mg/L | | |
| 12/10/2014 11:34 | D-006 OUTFALL | Nutrients | Temperature | 20.76 | C | | |
| 12/8/2014 10:38 | BLANKS (FIELD) | Metals | Iron | 30 U | ug/L | 30 | 120 |
| 12/8/2014 10:38 | BLANKS (FIELD) | Metals | Calcium | 0.075 U | mg/L | 0.075 | 0.3 |
| 12/8/2014 10:38 | BLANKS (FIELD) | Metals | Arsenic | 0.25 U | ug/L | 0.25 | 1 |
| 12/8/2014 10:38 | BLANKS (FIELD) | Metals | Magnesium | 0.040 U | mg/L | 0.04 | 0.16 |
| 12/8/2014 10:38 | BLANKS (FIELD) | Metals | Nickel | 0.25 U | ug/L | 0.25 | 1 |

| Date Sampled | Field ID | Analysis Group | Component | Result | Units | MDL | PQL |
|---|---|---|---|---|---|---|---|
| 12/8/2014 10:38 | BLANKS (FIELD) | Metals | Cadmium | 0.050 U | ug/L | 0.05 | 0.2 |
| 12/8/2014 10:38 | BLANKS (FIELD) | Metals | Lead | 0.20 U | ug/L | 0.2 | 0.8 |
| 12/8/2014 10:38 | BLANKS (FIELD) | Metals | Potassium | 0.30 U | mg/L | 0.3 | 1.2 |
| 12/8/2014 10:38 | BLANKS (FIELD) | Metals | Aluminum | 5.0 U | ug/L | 5 | 20 |
| 12/8/2014 10:38 | BLANKS (FIELD) | Metals | Zinc | 5.0 U | ug/L | 5 | 20 |
| 12/8/2014 10:38 | BLANKS (FIELD) | Metals | Selenium | 0.20 U | ug/L | 0.2 | 0.8 |
| 12/8/2014 10:38 | BLANKS (FIELD) | Metals | Copper | 0.50 U | ug/L | 0.5 | 1 |
| 12/8/2014 10:38 | BLANKS (FIELD) | Metals | Chromium | 0.30 U | ug/L | 0.3 | 1.2 |
| 12/8/2014 10:38 | BLANKS (FIELD) | Metals | Sodium | 0.50 U | mg/L | 0.5 | 2 |
| 12/8/2014 10:38 | BLANKS (FIELD) | Metals | Silver | 0.025 U | ug/L | 0.025 | 0.1 |
| 12/8/2014 10:38 | BLANKS (FIELD) | Nutrients | Organic Carbon | 0.50 U | mg C/L | 0.5 | 1 |
| 12/8/2014 10:38 | BLANKS (FIELD) | Nutrients | O-Phosphate-P | 0.004 U | mg P/L | 0.004 | 0.01 |
| 12/8/2014 10:38 | BLANKS (FIELD) | Nutrients | Color (true) | 2.5 U | PCU | 2.5 | 6 |
| 12/8/2014 10:38 | BLANKS (FIELD) | Nutrients | Turbidity | 0.10 U | NTU | 0.1 | 0.1 |
| 12/8/2014 10:38 | BLANKS (FIELD) | Nutrients | Total-P | 0.002 U | mg P/L | 0.0020 | .005 |
| 12/8/2014 10:38 | BLANKS (FIELD) | Nutrients | Sulfate | 0.20 U | mg SO4/L | 0.2 | 0.5 |
| 12/8/2014 10:38 | BLANKS (FIELD) | Nutrients | Ammonia-N | 0.002 U | mg N/L | 0.0020 | .005 |
| 12/8/2014 10:38 | BLANKS (FIELD) | Nutrients | Kjeldahl Nitrogen | 0.080 U | mg N/L | 0.08 | 0.2 |
| 12/8/2014 10:38 | BLANKS (FIELD) | Nutrients | NO2NO3-N | 0.004 U | mg N/L | 0.004 | 0.01 |
| 12/8/2014 10:38 | BLANKS (FIELD) | Nutrients | Chloride | 0.20 U | mg Cl/L | 0.2 | 0.5 |
| 12/8/2014 10:38 | BLANKS (FIELD) | Nutrients | Alkalinity | 0.65 U | mg CaCO3/L | 0.65 | 2.5 |
| 12/8/2014 10:38 | BLANKS (FIELD) | Overflow | Radium 228 | 0.5 U | pCi/L | 0.5 | 0.5 |
| 12/8/2014 10:38 | BLANKS (FIELD) | Overflow | Radium 228-Counting Error | 0.160 | pCi/L | | |
| 12/8/2014 10:38 | BLANKS (FIELD) | Overflow | Radium 226-Counting Error | 0.140 | pCi/L | | |
| 12/8/2014 10:38 | BLANKS (FIELD) | Overflow | Radium 226 | 0.367 U | pCi/L | 0.3670 | .367 |
| 12/8/2014 10:38 | BLANKS (FIELD) | Pesticides | Alachlor | 0.058 U | ug/L | 0.058 | 0.23 |
| 12/8/2014 10:38 | BLANKS (FIELD) | Pesticides | Atrazine Desethyl | 0.0097 U | ug/L | 0.00970 | .039 |
| 12/8/2014 10:38 | BLANKS (FIELD) | Pesticides | Butylate | 0.019 U | ug/L | 0.0190 | .078 |
| 12/8/2014 10:38 | BLANKS (FIELD) | Pesticides | Chlorpyrifos Ethyl | 0.0097 U | ug/L | 0.00970 | .039 |
| 12/8/2014 10:38 | BLANKS (FIELD) | Pesticides | Ethion | 0.0097 U | ug/L | 0.00970 | .039 |
| 12/8/2014 10:38 | BLANKS (FIELD) | Pesticides | Ethoprop | 0.0048 U | ug/L | 0.00480 | .019 |
| 12/8/2014 10:38 | BLANKS (FIELD) | Pesticides | Naled | 0.039 UJ | ug/L | 0.039 | 0.16 |
| 12/8/2014 10:38 | BLANKS (FIELD) | Pesticides | Prometon | 0.019 U | ug/L | 0.0190 | .078 |
| 12/8/2014 10:38 | BLANKS (FIELD) | Pesticides | Prometryn | 0.019 U | ug/L | 0.0190 | .078 |
| 12/8/2014 10:38 | BLANKS (FIELD) | Pesticides | Simazine | 0.0097 U | ug/L | 0.00970 | .039 |
| 12/8/2014 10:38 | BLANKS (FIELD) | Pesticides | Fonofos | 0.0097 U | ug/L | 0.00970 | .039 |
| 12/8/2014 10:38 | BLANKS (FIELD) | Pesticides | Phorate | 0.0048 U | ug/L | 0.00480 | .019 |
| 12/8/2014 10:38 | BLANKS (FIELD) | Pesticides | Disulfoton | 0.0048 U | ug/L | 0.00480 | .019 |
| 12/8/2014 10:38 | BLANKS (FIELD) | Pesticides | Malathion | 0.0097 U | ug/L | 0.00970 | .039 |

| Date Sampled | Field ID | Analysis Group | Component | Result | Units | MDL | PQL |
|---|---|---|---|---|---|---|---|
| 12/8/2014 10:38 | BLANKS (FIELD) | Pesticides | Metolachlor | 0.058 U | ug/L | 0.058 | 0.23 |
| 12/8/2014 10:38 | BLANKS (FIELD) | Pesticides | Demeton | 0.023 UJ | ug/L | 0.0230 | .093 |
| 12/8/2014 10:38 | BLANKS (FIELD) | Pesticides | Fenamiphos | 0.029 U | ug/L | 0.029 | 0.12 |
| 12/8/2014 10:38 | BLANKS (FIELD) | Pesticides | Metalaxyl | 0.039 UJ | ug/L | 0.039 | 0.16 |
| 12/8/2014 10:38 | BLANKS (FIELD) | Pesticides | Mevinphos | 0.0097 U | ug/L | 0.00970 | .039 |
| 12/8/2014 10:38 | BLANKS (FIELD) | Pesticides | Parathion Ethyl | 0.019 U | ug/L | 0.0190 | .078 |
| 12/8/2014 10:38 | BLANKS (FIELD) | Pesticides | Parathion Methyl | 0.0097 U | ug/L | 0.00970 | .039 |
| 12/8/2014 10:38 | BLANKS (FIELD) | Pesticides | Bromacil | 0.039 U | ug/L | 0.039 | 0.16 |
| 12/8/2014 10:38 | BLANKS (FIELD) | Pesticides | Chlorpyrifos Methyl | 0.0097 U | ug/L | 0.00970 | .039 |
| 12/8/2014 10:38 | BLANKS (FIELD) | Pesticides | Hexazinone | 0.029 UJ | ug/L | 0.029 | 0.12 |
| 12/8/2014 10:38 | BLANKS (FIELD) | Pesticides | Sucralose | 0.010 U | ug/L | 0.01 | 0.05 |
| 12/8/2014 10:38 | BLANKS (FIELD) | Pesticides | Diazinon | 0.0097 U | ug/L | 0.00970 | .039 |
| 12/8/2014 10:38 | BLANKS (FIELD) | Pesticides | Metribuzin | 0.019 U | ug/L | 0.0190 | .078 |
| 12/8/2014 10:38 | BLANKS (FIELD) | Pesticides | Atrazine | 0.0097 U | ug/L | 0.00970 | .039 |
| 12/8/2014 10:38 | BLANKS (FIELD) | Pesticides | Azinphos Methyl | 0.019 U | ug/L | 0.0190 | .078 |
| 12/8/2014 10:38 | BLANKS (FIELD) | Pesticides | Ametryn | 0.0097 U | ug/L | 0.00970 | .039 |
| 12/8/2014 10:38 | BLANKS (FIELD) | Pesticides | Atrazine Desisopropyl | 0.0097 U | ug/L | 0.00970 | .039 |
| 12/8/2014 10:38 | BLANKS (FIELD) | Pesticides | Norflurazon | 0.029 UJ | ug/L | 0.029 | 0.12 |
| 12/8/2014 10:38 | BLANKS (FIELD) | Priority Organic Pollutants | 2-Chlorophenol | 0.96 U | ug/L | 0.96 | 3.8 |
| 12/8/2014 10:38 | BLANKS (FIELD) | Priority Organic Pollutants | 2-Methyl-4,6-dinitrophenol | 2.9 U | ug/L | 2.9 | 12 |
| 12/8/2014 10:38 | BLANKS (FIELD) | Priority Organic Pollutants | N-Nitrosodimethylamine | 1.9 U | ug/L | 1.9 | 7.7 |
| 12/8/2014 10:38 | BLANKS (FIELD) | Priority Organic Pollutants | N-Nitrosodi-n-propylamine | 1.9 U | ug/L | 1.9 | 7.7 |
| 12/8/2014 10:38 | BLANKS (FIELD) | Priority Organic Pollutants | Hexachloroethane | 2.9 U | ug/L | 2.9 | 12 |
| 12/8/2014 10:38 | BLANKS (FIELD) | Priority Organic Pollutants | Di-n-butyl phthalate | 0.96 U | ug/L | 0.96 | 3.8 |
| 12/8/2014 10:38 | BLANKS (FIELD) | Priority Organic Pollutants | Chrysene | 0.19 U | ug/L | 0.19 | 0.77 |
| 12/8/2014 10:38 | BLANKS (FIELD) | Priority Organic Pollutants | Bis(2-ethylhexyl)phthalate | 1.9 U | ug/L | 1.9 | 7.7 |
| 12/8/2014 10:38 | BLANKS (FIELD) | Priority Organic Pollutants | Pyrene | 0.19 U | ug/L | 0.19 | 0.77 |
| 12/8/2014 10:38 | BLANKS (FIELD) | Priority Organic Pollutants | 2,6-Dinitrotoluene | 0.96 U | ug/L | 0.96 | 3.8 |
| 12/8/2014 10:38 | BLANKS (FIELD) | Priority Organic Pollutants | 2-Chloronaphthalene | 0.96 U | ug/L | 0.96 | 3.8 |
| 12/8/2014 10:38 | BLANKS (FIELD) | Priority Organic Pollutants | Anthracene | 0.19 U | ug/L | 0.19 | 0.77 |
| 12/8/2014 10:38 | BLANKS (FIELD) | Priority Organic Pollutants | Bis(2-chloroethoxy)methane | 0.96 U | ug/L | 0.96 | 3.8 |
| 12/8/2014 10:38 | BLANKS (FIELD) | Priority Organic Pollutants | Bis(2-chloroisopropyl)ether | 2.9 U | ug/L | 2.9 | 12 |
| 12/8/2014 10:38 | BLANKS (FIELD) | Priority Organic Pollutants | Butyl benzyl phthalate | 0.96 U | ug/L | 0.96 | 3.8 |
| 12/8/2014 10:38 | BLANKS (FIELD) | Priority Organic Pollutants | Di-n-octyl phthalate | 0.96 U | ug/L | 0.96 | 3.8 |
| 12/8/2014 10:38 | BLANKS (FIELD) | Priority Organic Pollutants | Fluorene | 0.19 U | ug/L | 0.19 | 0.77 |
| 12/8/2014 10:38 | BLANKS (FIELD) | Priority Organic Pollutants | Nitrobenzene | 1.9 U | ug/L | 1.9 | 7.7 |
| 12/8/2014 10:38 | BLANKS (FIELD) | Priority Organic Pollutants | Phenol | 0.96 U | ug/L | 0.96 | 3.8 |
| 12/8/2014 10:38 | BLANKS (FIELD) | Priority Organic Pollutants | Acenaphthene | 0.19 U | ug/L | 0.19 | 0.77 |
| 12/8/2014 10:38 | BLANKS (FIELD) | Priority Organic Pollutants | Hexachlorobenzene | 0.96 U | ug/L | 0.96 | 3.8 |

| Date Sampled | Field ID | Analysis Group | Component | Result | Units | MDL | PQL |
|---|---|---|---|---|---|---|---|
| 12/8/2014 10:38 | BLANKS (FIELD) | Priority Organic Pollutants | Pentachlorophenol | 0.96 U | ug/L | 0.96 | 3.8 |
| 12/8/2014 10:38 | BLANKS (FIELD) | Priority Organic Pollutants | 2,4-Dinitrophenol | 14 UJ | ug/L | 14 | 58 |
| 12/8/2014 10:38 | BLANKS (FIELD) | Priority Organic Pollutants | 3,3'-Dichlorobenzidine | 38 U | ug/L | 38 | 150 |
| 12/8/2014 10:38 | BLANKS (FIELD) | Priority Organic Pollutants | 4-Bromophenyl phenyl ether | 0.96 U | ug/L | 0.96 | 3.8 |
| 12/8/2014 10:38 | BLANKS (FIELD) | Priority Organic Pollutants | Fluoranthene | 0.19 U | ug/L | 0.19 | 0.77 |
| 12/8/2014 10:38 | BLANKS (FIELD) | Priority Organic Pollutants | 2,4,6-Trichlorophenol | 0.96 U | ug/L | 0.96 | 3.8 |
| 12/8/2014 10:38 | BLANKS (FIELD) | Priority Organic Pollutants | 4-Chloro-3-methylphenol | 0.96 U | ug/L | 0.96 | 3.8 |
| 12/8/2014 10:38 | BLANKS (FIELD) | Priority Organic Pollutants | 4-Chlorophenyl phenyl ether | 1.9 U | ug/L | 1.9 | 7.7 |
| 12/8/2014 10:38 | BLANKS (FIELD) | Priority Organic Pollutants | Benzo(b)fluoranthene | 0.19 U | ug/L | 0.19 | 0.77 |
| 12/8/2014 10:38 | BLANKS (FIELD) | Priority Organic Pollutants | Benzo(k)fluoranthene | 0.19 U | ug/L | 0.19 | 0.77 |
| 12/8/2014 10:38 | BLANKS (FIELD) | Priority Organic Pollutants | Bis(2-chloroethyl)ether | 0.96 U | ug/L | 0.96 | 3.8 |
| 12/8/2014 10:38 | BLANKS (FIELD) | Priority Organic Pollutants | Hexachlorobutadiene | 2.9 U | ug/L | 2.9 | 12 |
| 12/8/2014 10:38 | BLANKS (FIELD) | Priority Organic Pollutants | Naphthalene | 0.19 U | ug/L | 0.19 | 0.77 |
| 12/8/2014 10:38 | BLANKS (FIELD) | Priority Organic Pollutants | Phenanthrene | 0.19 U | ug/L | 0.19 | 0.77 |
| 12/8/2014 10:38 | BLANKS (FIELD) | Priority Organic Pollutants | 2,4-Dimethylphenol | 9.6 U | ug/L | 9.6 | 38 |
| 12/8/2014 10:38 | BLANKS (FIELD) | Priority Organic Pollutants | 2,4-Dinitrotoluene | 0.96 U | ug/L | 0.96 | 3.8 |
| 12/8/2014 10:38 | BLANKS (FIELD) | Priority Organic Pollutants | Benzo(a)anthracene | 0.19 U | ug/L | 0.19 | 0.77 |
| 12/8/2014 10:38 | BLANKS (FIELD) | Priority Organic Pollutants | Diethyl phthalate | 0.96 U | ug/L | 0.96 | 3.8 |
| 12/8/2014 10:38 | BLANKS (FIELD) | Priority Organic Pollutants | Dimethyl phthalate | 0.96 U | ug/L | 0.96 | 3.8 |
| 12/8/2014 10:38 | BLANKS (FIELD) | Priority Organic Pollutants | Hexachlorocyclopentadiene | 2.9 U | ug/L | 2.9 | 12 |
| 12/8/2014 10:38 | BLANKS (FIELD) | Priority Organic Pollutants | Indeno(1,2,3-cd)pyrene | 0.19 U | ug/L | 0.19 | 0.77 |
| 12/8/2014 10:38 | BLANKS (FIELD) | Priority Organic Pollutants | Isophorone | 0.96 U | ug/L | 0.96 | 3.8 |
| 12/8/2014 10:38 | BLANKS (FIELD) | Priority Organic Pollutants | 2,4-Dichlorophenol | 0.96 U | ug/L | 0.96 | 3.8 |
| 12/8/2014 10:38 | BLANKS (FIELD) | Priority Organic Pollutants | Acenaphthylene | 0.19 U | ug/L | 0.19 | 0.77 |
| 12/8/2014 10:38 | BLANKS (FIELD) | Priority Organic Pollutants | Benzidine | 96 U | ug/L | 96 | 380 |
| 12/8/2014 10:38 | BLANKS (FIELD) | Priority Organic Pollutants | Benzo(a)pyrene | 0.19 U | ug/L | 0.19 | 0.77 |
| 12/8/2014 10:38 | BLANKS (FIELD) | Priority Organic Pollutants | Benzo(g,h,i)perylene | 0.19 U | ug/L | 0.19 | 0.77 |
| 12/8/2014 10:38 | BLANKS (FIELD) | Priority Organic Pollutants | Dibenzo(a,h)anthracene | 0.19 U | ug/L | 0.19 | 0.77 |
| 12/8/2014 10:38 | BLANKS (FIELD) | Priority Organic Pollutants | N-Nitrosodiphenylamine/ Diphenylamine | 2.9 U | ug/L | 2.9 | 12 |
| 12/8/2014 10:38 | BLANKS (FIELD) | Priority Organic Pollutants | 1,2,4-Trichlorobenzene | 0.96 U | ug/L | 0.96 | 3.8 |
| 12/8/2014 10:38 | BLANKS (FIELD) | Priority Organic Pollutants | 2-Nitrophenol | 0.96 U | ug/L | 0.96 | 3.8 |
| 12/8/2014 10:38 | BLANKS (FIELD) | Priority Organic Pollutants | 4-Nitrophenol | 14 U | ug/L | 14 | 58 |
| 12/8/2014 11:16 | BLANKS (EQUIPMENT) | Nutrients | Kjeldahl Nitrogen | 0.080 U | mg N/L | 0.08 | 0.2 |
| 12/8/2014 11:16 | BLANKS (EQUIPMENT) | Nutrients | Ammonia-N | 0.002 U | mg N/L | 0.0020 | .005 |
| 12/8/2014 11:16 | BLANKS (EQUIPMENT) | Nutrients | NO2NO3-N | 0.004 U | mg N/L | 0.004 | 0.01 |
| 12/8/2014 11:16 | BLANKS (EQUIPMENT) | Nutrients | Fluoride | 0.035 U | mg F/L | 0.035 | 0.1 |
| 12/8/2014 11:16 | BLANKS (EQUIPMENT) | Nutrients | Total-P | 0.002 U | mg P/L | 0.0020 | .005 |
| 12/8/2014 11:16 | BLANKS (EQUIPMENT) | Nutrients | O-Phosphate-P | 0.004 U | mg P/L | 0.004 | 0.01 |

**EPA End Sheet**

## The Bioassay of Tampa Port Services, LLC - Port Sutton effluent sampled on December 8, 10 and 12, 2014. NPDES #FL0000264.

Fill Out This Section For All Surface Water Discharger Inspections(CEI, CSI, CBI, PAI, XSI-RI Optional)

| Transaction Code | NPDES NUMBER | YR/MO/DA | Insp Type | Inspector | Fac Type |
|---|---|---|---|---|---|
| 1 N 2 5 | 3 F L 0 0 0 0 2 6 4 | 11 12 14 12 08 | 18 **B** | 19 **S** | 20 2 |

Remarks

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## The Priority Pollutants Analysis of Tampa Port Services, LLC - Port Sutton effluent sampled on December 8, 2014. NPDES #FL0000264.

Fill Out This Section For All Surface Water Discharger Inspections(CEI, CSI, CBI, PAI, XSI-RI Optional)

| Transaction Code | NPDES NUMBER | YR/MO/DA | Insp Type | Inspector | Fac Type |
|---|---|---|---|---|---|
| 1 N 2 5 | 3 F L 0 0 0 0 2 6 4 | 11 12 14 12 08 | 18 **X** | 19 **S** | 20 2 |

Remarks

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## Biological Analyses of Tampa Port Services, LLC - Port Sutton effluent sampled on December 8, 2014. NPDES #FL0000264.

Fill Out This Section For All Surface Water Discharger Inspections(CEI, CSI, CBI, PAI, XSI-RI Optional)

| Transaction Code | NPDES NUMBER | YR/MO/DA | Insp Type | Inspector | Fac Type |
|---|---|---|---|---|---|
| 1 N 2 5 | 3 F L 0 0 0 0 2 6 4 | 11 12 14 12 08 | 18 **S** | 19 **S** | 20 2 |

Remarks

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