



Biological Assessment of  
**Nitram Incorporated**

Hillsborough County

NPDES #FL0001643

Sampled May 1994

August 1994

**Biology Section**  
**Division of Administrative and Technical Services**

Department of Environmental Protection  
Results of Fifth Year Inspections

Discharger: Nitram Incorporated  
County: Hillsborough  
NPDES Number: FL0001643  
State Permit Expiration Date: 14 March 1995

Toxics Sampling Inspection (XSI)

Date Sampled: 2 May 1994  
Results: No organic constituents or harmful levels of metals were detected in the effluent.

Compliance Biomonitoring Inspection (CBI)

Date Sampled: 2 May 1994  
Results: The sample of effluent was acutely toxic to the invertebrate, *Mysidopsis bahia*, with 50% mortality after 24 hours and 60% mortality after 48 hours. This is a violation of 17-302.530(62) FAC, 17-302.500(1)(d) FAC, and 17-4.244(3)(a) FAC. The effluent was not acutely toxic to the fish, *Menidia beryllina*.

Impact Bioassessment Inspection (IBI)

Date Sampled: 2 May 1994  
Results: Quantitative measures of benthic macroinvertebrate community health suggested no adverse effects caused by the discharge. Taxa richness and Shannon-Weaver diversity were both higher at the test site when compared with the reference site. Many taxa considered sensitive to pollution were recovered from the test site, including *Polypedilum halterale* grp., *Procladius* sp., *Uromunna reynoldsi*, and *Dubiraphia* sp., suggesting no negative effects from the discharge. Differences between the communities found at reference and test sites were probably more related to their respective salinity regimes than to other aspects of water quality. Apparently, dilution of the acutely toxic effluent was sufficient that no toxic effects were noted in the receiving water macroinvertebrate community. Measures of phytoplankton community health, such as taxa richness, the % contribution of dominant taxon, and chlorophyll *a* indicated no near field enrichment effects from the effluent. Because no stations were established to measure far field effects from this discharge, it is unknown whether the elevated nitrate-nitrite in the effluent (and at the test site) is having detrimental effects on algal communities elsewhere in the estuary.

Water Quality Inspection (WQI)

Date Sampled: 2 May 1994  
Results: Of the nutrients measured in the Nitram effluent, only the concentration of nitrate-nitrite (4.5 mg/L) appeared to have an observed enrichment effect on Delaney Creek. Nitrate-nitrite at the test site (1.5 mg/L) was higher than 95% of the values found in other estuaries. Algal growth potential of the Nitram effluent was 0.14 mg dry wt/L, which suggests some sort of algal inhibition. AGP measured at the reference site (20.2 mg dry wt/L) and at the test site (30.2 mg dry wt/L) both exceeded the "problem threshold" of 10 mg dry wt/L for saltwaters.

## Introduction

Nitram Incorporated, a manufacturer of solid ammonium nitrate and ammonium nitrate fertilizer solutions, is located in Tampa, Florida (see maps in appendix). Wastewater from contaminated runoff areas, non-contact cooling water, boiler blowdown, condensate, and demineralizer regenerant are all combined in a mix tank, where it is aerated and pH adjusted. From the mix tank, wastewater may be routed to a lined holding pond, or may be pumped through a 1300 foot pipeline to the Class III Delaney Creek, eventually mixing into Hillsborough Bay (see maps in Appendix). A lined hyacinth pond also receives cooling tower blowdown. Although the permit limit for flow is 1.0 MGD maximum, actual mean flow of the facility has been 0.382 MGD.

Permit limits for Nitram Incorporated are as follows: TSS (20 mg/L daily maximum), total nitrogen concentration (12 mg/L daily maximum, 7 mg/L monthly average), total nitrogen load (50 lbs/day daily maximum, 25 lbs/day monthly average), unionized ammonia (0.02 mg/L daily maximum), temperature (90 °F daily maximum), dissolved oxygen (6.0 mg/L daily minimum), and pH (6.0 - 8.5 SU's).

Facility Monthly Operating Reports indicate no surface water violations in the past year, however, pH was below permit limits in June and August of 1992. A 5700 gallon ammonium nitrate spill occurred in March, 1993. The spilled material percolated into the ground, and did not enter the

surrounding surface waters. A consent order (#87-0581) was issued in response to past surface water quality violations and current ground water violations.

Past toxicity bioassays (in March, 1988 and October, 1989) indicated that the effluent was not toxic to *Ceriodaphnia dubia* or *Cyprinella leedsii*. A waste load allocation study has previously been performed on Delaney Creek by DEP.

## Methods

The focus of this investigation was to determine the discharger's effects on the receiving waters. A comparison of biological community health was made between a reference site (located in Archie Creek, approximately 2.5 miles away from the discharge) and a test site (in Delaney Creek, approximately 500

*Major characteristics of community structure of control and test sites.*

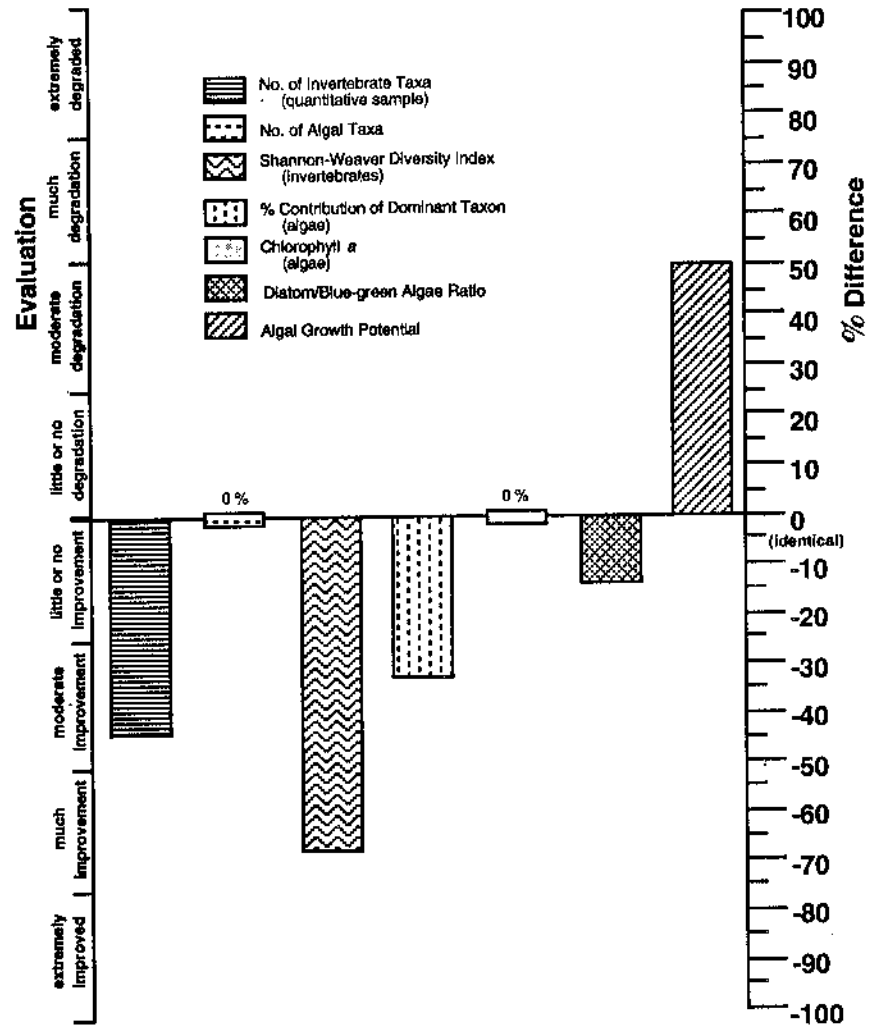
	Reference Site	Test Site
<b>Macroinvertebrate Quantitative</b>		
Number of Taxa	16	23
Shannon-Weaver Diversity	2.14	3.58
% Oligochaeta	0.3	16.9
% Diptera	3.1	40.4
% Amphipoda	51.2	1.0
% Cumacea	0.1	3.7
% Isopoda	5.6	8.6
% Gastropoda	4.4	3.1
% Pelecypoda	0.4	5.1
% Polychaeta	34.8	21.3
% Other	0.0	1.2
% Predators/Carnivores	21.0	19.4
% Above Surface Collector-Gatherer/Deposit Feeders	63.8	32.0
% Below Surface Collector-Gatherer/Deposit Feeders	0.3	18.8
% Collector-Filterer/Suspension Feeders	10.0	22.3
% Scrapers	4.5	3.6
% Shredders	0.5	3.8
% Parasites	0.0	0.1
<b>Phytoplankton Algae</b>		
Number of Taxa	11	11
% Contribution of Dominant Taxon	34.8	23.6
Chlorophyll a (µg/L)	0.4 U	0.4 U
Diatom/Blue-Green Abundance Ratio	0.86	0.98
% Blue-green	8.7	1.8
% Green	34.8	5.5
% Diatoms	54.3	91.0
% Other	2.2	1.8
<b>Algal Growth Potential (mg dry wt/l)</b>	20.2	30.2

yards downstream of the discharge). A habitat assessment was performed *in situ* to establish comparability between sites. Supplemental physical/chemical data were also collected on the effluent and study sites. Acute screening toxicity bioassays, using *Menidia beryllina* and *Mysidopsis bahia* as test organisms, were performed on an effluent sample (Weber 1993). The effluent was analyzed for metals and for organic constituents (base neutral and acid extractables, and pesticide extractables). Additionally, nutrient analyses were performed on effluent, reference, and test sites. Methods used for all chemical analyses are on file at the Tallahassee DEP Chemistry Laboratory.

Benthic macroinvertebrate communities were evaluated at reference and test sites. Invertebrates were collected via three Ponar grabs per site (Ross 1990). Phytoplankton was sampled at reference and test sites by subsurface grabs. Chlorophyll *a* was also determined for phytoplankton communities (Ross 1990). Algal Growth Potential tests, using *Selenastrum capricornutum* or *Dunaliella tertiolecta* as the test organism (depending on salinity), followed Miller *et al.* (1978) and EPA (1974).

### Explanation of Measurements of Community Health

Several different measurements of macroinvertebrate and algal community health have been employed in this report. Many of these, such as the number of taxa, Shannon-Weaver Diversity Index, and chlorophyll *a* are well known.



**Effect of discharge on receiving stream**  
(measured as difference between control and test sites).

Others are briefly explained here. Excessive numerical dominance of a single type of organism (a high % contribution of dominant taxon) is usually associated with disturbance. A decreased diatom to blue-green algae ratio (calculated by dividing the number of individuals in the Bacillariophyta by the number of individuals in the Bacillariophyta + Cyanophyta) is often indicative of nutrient enriched conditions. The determination of the Quantitative Stability Index (for taxonomic % composition) is a two step process. First, the relative proportions of major taxonomic groups are calculated for each site. Then, the less-

er of the two percentages for each discrete taxonomic group is selected, and their cumulative total is the QSI. A QSI (for % composition) of 100% means that the two sites being compared are identical. This same type of procedure is used for calculating the QSI (for functional feeding groups).

For graphical purposes, the percent differences between the reference and test sites involving the number of taxa, the diversity index, and the diatom to blue-green algae ratio are measured as the reference site minus test site divided by the reference site. The percent differ-

ences between sites involving the percent contribution of dominant taxon, chlorophyll  $\alpha$ , and algal growth potential are measured as the test site minus reference site divided by the reference site.

The following personnel were involved in this investigation: Pat Fricano, Stefan Schulze, and Lisa Carter (DEP Southwest District); and Marshall Faircloth, Russel Frydenborg, Kathleen Lurding, Tina Mikulski, Ed Miller, Liz Miller, Jack Taylor, David Whiting, and David Young (Tallahassee Biology Laboratory). The report was reviewed by the Point Source Studies Review Committee, consisting of Wayne Magley, Jan Mandrup-Poulsen, and Michael Tanski, as well as District representatives.

## Results and Discussion

The study area can best be characterized as a tidal creek estuarine system adjacent to salt marshes and highly developed uplands. Habitat quality was similar at both sites, with 55 points at the Archie Creek reference site and 56 points at the Delaney Creek test site. Land use in the area was predominantly residential and industrial. The two study sites were comparable regarding most physical/chemical parameters, such as: secchi depth (between 0.3 m and 0.5 m), temperature (27.3 °C at the reference site and 24.8 °C at the test site), dissolved oxygen (2.5 mg/L at the reference site and 2.8 at the test site), and pH (6.9 SU's at the reference site and 6.8 SU's at the test site). While the predominant sub-

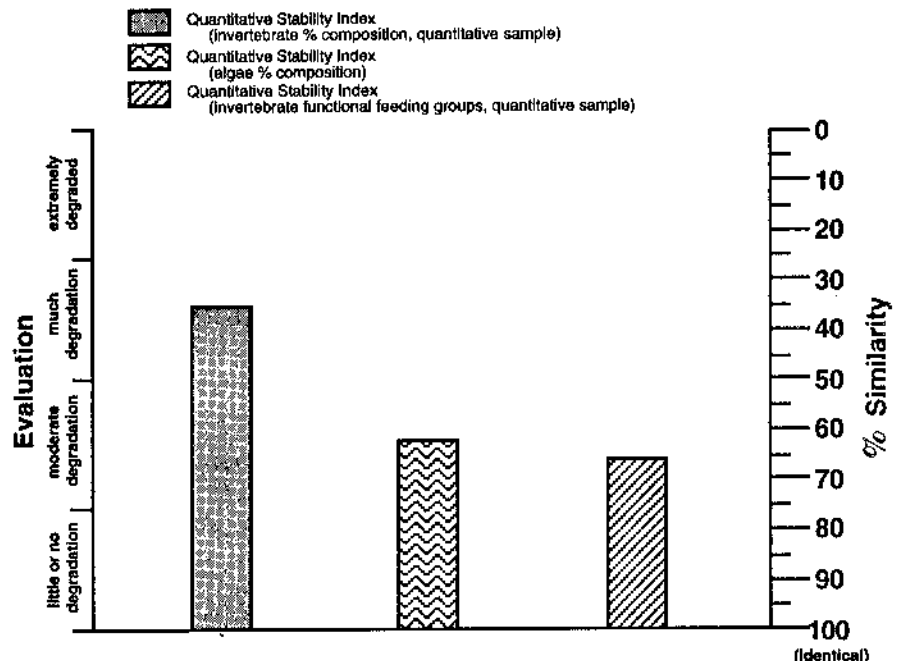
strate type was mud/sand/silt (at least 80%) at both sites, aquatic vegetation was common at the test site (20% of the substrates present), but absent at the reference site. The study sites were fairly dissimilar with respect to salinity. The salinity of the reference site was 5.3 ppt, while it was less than 1 ppt at the test site (1146  $\mu$ mhos/cm). It should also be noted that dissolved oxygen was below Class III standards at both stations.

No organic constituents, including pesticides, herbicides, polychlorinated biphenyls, etc., were detected in the effluent (but the blank was contaminated with 1.9  $\mu$ g/L of trichlorofluoromethane). The metals calcium (196  $\mu$ g/L), iron (65  $\mu$ g/L), magnesium (46.2  $\mu$ g/L), and zinc (20  $\mu$ g/L) were found in the effluent. None of these concentrations represent a violation of Class III standards for marine waters.

The sample of effluent was acutely toxic to the invertebrate

*Mysidopsis bahia*, with 50% mortality after 24 hours and 60% mortality after 48 hours. This is a violation of 17-302.530(62) FAC, 17-302.500(1)(d) FAC, and 17-4.244(3)(a) FAC. The cause of the toxicity was not determined. No mortality to the fish, *Menidia beryllina*, occurred during the 48 hour test.

Of the nutrients measured in the Nitram effluent, only the concentration of nitrate-nitrite (4.5 mg/L) appeared to have an observed enrichment effect on Delaney Creek, but no permit violations of total nitrogen were noted. Nitrate-nitrite at the test site (1.5 mg/L) was higher than 95% of the values found in other estuaries (see list of typical water quality values in Appendix). Effluent ortho-phosphate (0.24 mg/L) and total phosphorus (0.38 mg/L) levels were much lower than those found in both receiving water sites, suggesting inputs from other sources. To illus-



Effect of discharge on receiving stream  
(measured as similarity between control and test sites).

trate, total phosphorus and orthophosphate measured at the reference and test sites were higher than approximately 95% of other Florida estuaries. Unionized ammonia in the effluent was calculated to be 0.0007 mg/L, well below the 0.02 mg/L permit limit. Ammonia was higher at the test site (0.84 mg/L) than at the reference site (0.14 mg/L) or in the effluent (0.31 mg/L). In summary, nitrate-nitrite enrichment at the test site appeared to be related to the discharge, however, the elevation of other nutrients was probably related to non-point sources.

Algal growth potential (AGP) results require some interpretation. Effluent AGP was 0.14 mg dry wt/L, which, when considering the nutrient values, suggests some sort of algal inhibition. Algal Growth Potential measured at the reference site (20.2 mg dry wt/L) and at the test site (30.2 mg dry wt/L) both exceeded the "problem threshold" of 10 mg dry wt/L for saltwaters (Ron Raschke, USEPA, personal communication). While the AGP measured at the reference site probably reflects non-point source runoff, the higher test site AGP may be related to the nitrate-nitrite enrichment from the effluent.

Total coliforms (6 organisms/100 mL) and fecal coliforms (2 organisms/100 mL) measured in the effluent were well within water quality standards. Similarly, fecal coliforms at the reference site (228 organisms/100 mL) and test site (464 organisms/100 mL) were within standards. Total coliforms at both receiving water stations were "too numerous to count" (personal communication, Kent Ed-

wards, DEP Southwest District), suggesting, but not substantiating, the possibility of violations.

Total Suspended Solids of the Nitram effluent was measured at less than 1 mg/L, which is within the permit limit.

Quantitative measures of benthic macroinvertebrate community health suggested no adverse effects caused by the discharge. However, the data interpretation was complicated by salinity differences between the reference and test sites. The Archie Creek reference site (5.3 ppt) had higher salinity than the test site (less than 1 ppt). The biota may have responded more to these salinity differences than to other aspects of the discharge. The figure on page 2 indicates the degree of difference between the reference and test sites. Larger differences (that is higher percentages) correspond with greater degrees of degradation. Negative values mean that the test site is better than the reference. The figure on page 3 summarizes similarities between the sites. Smaller similarities (lower percentages) generally correspond with greater degradation.

Taxa richness was higher at the Delaney Creek test site (23 taxa) than at the Archie Creek reference site (with 16 taxa). Many of the additional taxa at the test site were freshwater chironomids (e.g., *Polypedilum* spp. and *Tanytarsus* sp. G Epler). Shannon-Weaver diversity was also increased at the test site (3.6) when compared with the reference site (2.1).

The biota at the two sites were fairly dissimilar with respect to

community structure. At the reference site, amphipods (51%) were most numerous, followed by polychaetes (34.8%), isopods (5.6%), and gastropods (4.4%), as well as other groups. At the test site, dipterans were the most abundant group present (40.4% of the total), followed by polychaetes (21.3%), oligochaetes (16.9%), isopods (8.6%), and pelecypods (5.6%). The dominant amphipods at the reference site were *Corophium louisianum* and *Grandideriella bonnieroides*, both of which are common in low salinity waters throughout the state. *Corophium louisianum* is considered moderately sensitive to organic enrichment (Farrell 1991). *Laonereis culveri*, a low salinity adapted form, was the most abundant polychaete at both sites. Many taxa considered sensitive to pollution were recovered from the test site, including *Polypedilum halterale* grp., *Procladius* sp., *Uromunna reynoldsi*, and *Dubiraphia* sp., suggesting no negative effects from the discharge. Differences between the communities found at reference and test sites were probably more related to their respective salinity regimes than to other aspects of water quality. Apparently, dilution of the acutely toxic effluent was sufficient that no toxic effects were noted in the receiving water macroinvertebrate community.

The phytoplankton assemblage found at the reference and test sites were identical in taxa richness (11 taxa at both the reference and test sites). The % contribution of dominant taxon (*Navicula* sp.) was somewhat higher at the reference site (34.8%) than the

test site, which was dominated by *Nitzschia* sp. (23.6%). Diatoms were most numerous at both sites, with chlorophytes and cyanophytes also represented. Chlorophyll  $\alpha$  was identical at both sites (0.4  $\mu\text{g/L}$ ). These values are much lower than those typically found in Florida estuaries, suggesting no near field enrichment effects. Because no stations were established to measure far field effects from this discharge, it is unknown whether the elevated nitrate-nitrite in the effluent (and seen at the test site) is having detrimental effects on algal communities elsewhere in the estuary.

## Conclusions

No organic constituents or harmful levels of metals were detected in the effluent.

The sample of effluent was acutely toxic to the invertebrate, *Mysidopsis bahia*, with 50% mortality after 24 hours and 60% mortality after 48 hours. This is a violation of 17-302.530(62) FAC, 17-302.500(1)(d) FAC, and 17-4.244(3)(a) FAC. The cause of the toxicity was not determined. No mortality to the fish, *Menidia beryllina*, occurred during the 48 hour test.

Of the nutrients measured in the Nitram effluent, only the concentration of nitrate-nitrite (4.5 mg/L) appeared to have an observed enrichment effect on

Delaney Creek, but no permit violations of total nitrogen were noted. Nitrate-nitrite at the test site (1.5 mg/L) was higher than 95% of the values found in other estuaries. While total phosphorus and ortho-phosphate measured at the reference and test sites were higher than approximately 95% of other Florida estuaries, these levels were also higher than those found in the discharge, suggesting inputs from other sources. Unionized ammonia in the effluent was calculated to be 0.0007 mg/L, well below the 0.02 mg/L permit limit. In summary, nitrate-nitrite enrichment at the test site appeared to be related to the discharge, however, the elevation of other nutrients was probably related to non-point sources.

Algal growth potential of the Nitram effluent was 0.14 mg dry wt/L, which, when considering the nutrient values, suggests some sort of algal inhibition. Values measured at the reference site (20.2 mg dry wt/L) and at the test site (30.2 mg dry wt/L) both exceeded the "problem threshold" of 10 mg dry wt/L for saltwaters. While the AGP measured at the reference site probably reflects non-point source runoff, the higher test site AGP may be related to the nitrate-nitrite enrichment from the effluent.

Total and fecal coliforms measured in the effluent were well within water quality standards. While fecal coliform levels were within standards at receiving water stations, total coliforms were "too numerous to count", suggesting, but not

substantiating, the possibility of violations.

Total Suspended Solids of the Nitram effluent was measured at less than 1 mg/L, which is within the permit limit.

Quantitative measures of benthic macroinvertebrate community health suggested no adverse effects caused by the discharge. Taxa richness and Shannon-Weaver diversity were both higher at the test site when compared with the reference site. Many taxa considered sensitive to pollution were recovered from the test site, including *Polypedilum halterale* grp., *Procladius* sp., *Uromunna reynoldsi*, and *Dubiraphia* sp., suggesting no negative effects from the discharge. Differences between the communities found at reference and test sites were probably more related to their respective salinity regimes than to other aspects of water quality. Apparently, dilution of the acutely toxic effluent was sufficient that no toxic effects were noted in the receiving water macroinvertebrate community.

Measures of phytoplankton community health, such as taxa richness, the % contribution of dominant taxon, and chlorophyll  $\alpha$  indicated no near field enrichment effects from the effluent. Because no stations were established to measure far field effects from this discharge, it is unknown whether the elevated nitrate-nitrite in the effluent (and seen at the test site) is having detrimental effects on algal communities elsewhere in the estuary.

## Literature Cited

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- Weber, C. I. 1991. Methods for measuring the acute toxicity of effluents to freshwater and marine organisms. 4th edition. EPA/600/4-90/027. U. S. EPA, Cincinnati, Ohio. 216 pp.



**Chemistry summary table for**

<b>Nitram Incorporated</b>	<b>Effluent</b>	<b>Reference Site</b>	<b>Test Site</b>
<b>Organic Constituents (ug/L)</b>			
Blank contamination-Trichlorofluoromethane	1.9		
<b>Metals (ug/L)</b>			
Aluminum	100 U		
Antimony	8 U		
Arsenic	20 U		
Cadmium	0.16 U		
Calcium	196		
Copper	10 U		
Chromium	10 U		
Iron	65		
Lead	15 U		
Magnesium	46.2		
Mercury	0.10 U		
Nickel	5 U		
Selenium	30 U		
Silver	0.05 U		
Zinc	20 J		
<b>Nutrients (mg/L)</b>			
Ortho-phosphate	0.24	0.78 A	1.2
Total phosphorus	0.38	1.1	1.4
Ammonia	0.31	0.14	0.84
Nitrate+Nitrite	4.5	0.063	1.5 A
TKN	1.1	1.1	2.2
<b>Other Parameters</b>			
Habitat Assessment		55	56
D.O. (mg/L)	7.1	2.5	2.8
pH (SU's)	6.5	6.9	6.8
Salinity (ppt)	1.5	5.3	< 1
Specific Conductance (µmhos/cm)	3630	10,140	1146
Temperature (°C)	24.6	27.3	24.8
Hardness (mg CaCO <sub>3</sub> )	679.7		260.0
Total Coliforms (#/100ml)	6 J	B	B
Fecal Coliforms (#/100ml)	2 K	228 J	464 J
TSS (mg/L)	1 K		
Bioassay Fish-Dechlorinated	Not toxic		
Bioassay Invertebrate-Dechlorinated	LC50 < 100%		
Algal Growth Potential (mg dry wt/L)	0.14	20.2	30.2

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

B - Results based on colony counts outside the acceptable range

J - Estimated value

K - Actual value is known to be less than value given

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

**Typical Values for Selected Parameters in Florida Waters**  
 Adapted from Joe Hand, FDER, personal communication, 1991  
 (data was collected between 1980 and 1989)

**Percentile Distribution**

Parameter	5%	10%	20%	30%	40%	50%	60%	70%	80%	90%	95%
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**STREAMS**  
(1617 stations)

Phytoplankton Chlorophyll <i>a</i>	0.22	0.52	0.94	1.60	3.02	4.63	6.72	9.87	14.68	27.35	48.70
Periphyton Chlorophyll <i>a</i>	0.31	0.43	0.77	1.04	2.16	2.94	6.45	10.51	17.00	39.51	60.85
H-D Diversity	0.84	2.12	2.48	2.74	2.88	3.09	3.25	3.40	3.52	3.76	3.90
Qualitative Taxa Richness	9.00	12.00	17.00	20.00	22.00	24.50	26.00	28.00	31.00	37.00	53.00
H-D Taxa Richness	6.00	6.50	9.00	11.50	13.00	15.00	17.00	21.50	26.00	29.00	32.00
TKN	0.30	0.39	0.56	0.73	0.87	1.00	1.11	1.26	1.49	1.93	2.80
Ammonia	0.02	0.02	0.04	0.05	0.06	0.08	0.11	0.14	0.20	0.34	0.60
NO <sub>2</sub> -NO <sub>3</sub>	0.01	0.01	0.03	0.05	0.07	0.10	0.14	0.20	0.32	0.64	1.05
Total Phosphorus	0.02	0.03	0.05	0.06	0.10	0.13	0.18	0.25	0.39	0.74	1.51
Ortho Phosphate	0.01	0.01	0.03	0.04	0.05	0.08	0.11	0.17	0.27	0.59	1.37
Turbidity	0.60	0.90	1.20	1.45	2.10	2.80	3.60	4.50	6.65	10.45	16.30

**LAKES**

(477 stations)

Phytoplankton Chlorophyll <i>a</i>	0.80	1.71	2.88	4.28	10.06	13.40	20.00	30.10	47.20	65.44	113.90
Dredge Diversity	0.71	0.97	1.43	1.74	1.98	2.12	2.21	2.59	2.85	3.15	3.17
Dredge Taxa Richness	3.00	5.00	6.50	7.00	9.00	10.00	11.00	13.00	15.00	17.00	21.00
TKN	0.36	0.49	0.67	0.83	1.08	1.26	1.40	1.51	1.68	2.11	3.46
NH <sub>3</sub> +NH <sub>4</sub>	0.01	0.02	0.02	0.03	0.04	0.06	0.08	0.12	0.15	0.21	0.28
NO <sub>2</sub> -NO <sub>3</sub>	0.00	0.00	0.01	0.01	0.01	0.02	0.04	0.05	0.10	0.14	0.23
Total Phosphorus	0.01	0.02	0.02	0.03	0.05	0.07	0.09	0.11	0.14	0.23	0.42
Ortho-Phosphate	0.00	0.01	0.01	0.02	0.03	0.04	0.05	0.06	0.08	0.21	0.32
Turbidity	1.00	1.25	1.55	2.05	2.75	4.50	6.45	9.60	14.10	26.00	40.00

**ESTUARIES**

(690 stations)

Phytoplankton Chlorophyll <i>a</i>	2.14	3.28	4.49	5.13	6.00	6.93	7.94	9.60	12.40	17.60	22.20
Dredge Diversity	1.34	1.53	1.91	2.28	2.56	2.90	3.15	3.59	4.01	4.53	4.98
Dredge Taxa Richness	4.00	6.00	9.00	11.00	15.00	18.50	25.00	35.00	41.00	62.00	90.00
TKN	0.26	0.34	0.42	0.50	0.59	0.69	0.76	0.82	0.95	1.30	1.49
NH <sub>3</sub> +NH <sub>4</sub>	0.01	0.02	0.03	0.04	0.05	0.06	0.08	0.09	0.13	0.22	0.28
NO <sub>2</sub> -NO <sub>3</sub>	0.00	0.00	0.01	0.01	0.01	0.02	0.03	0.05	0.08	0.17	0.23
Total Phosphorus	0.01	0.02	0.06	0.07	0.10	0.11	0.14	0.17	0.23	0.43	0.59
Ortho-Phosphate	0.01	0.02	0.03	0.04	0.04	0.05	0.07	0.09	0.12	0.21	0.44
Turbidity	3.50	4.00	4.50	5.05	5.40	5.60	6.30	6.80	8.00	11.40	11.75

**Units:**

Phytoplankton Chlorophyll *a* (ug/L), Periphyton Chlorophyll *a* (mg/m<sup>2</sup>), Nutrients (mg/L), Turbidity (NTU), Taxa richness and diversity values are for macroinvertebrates

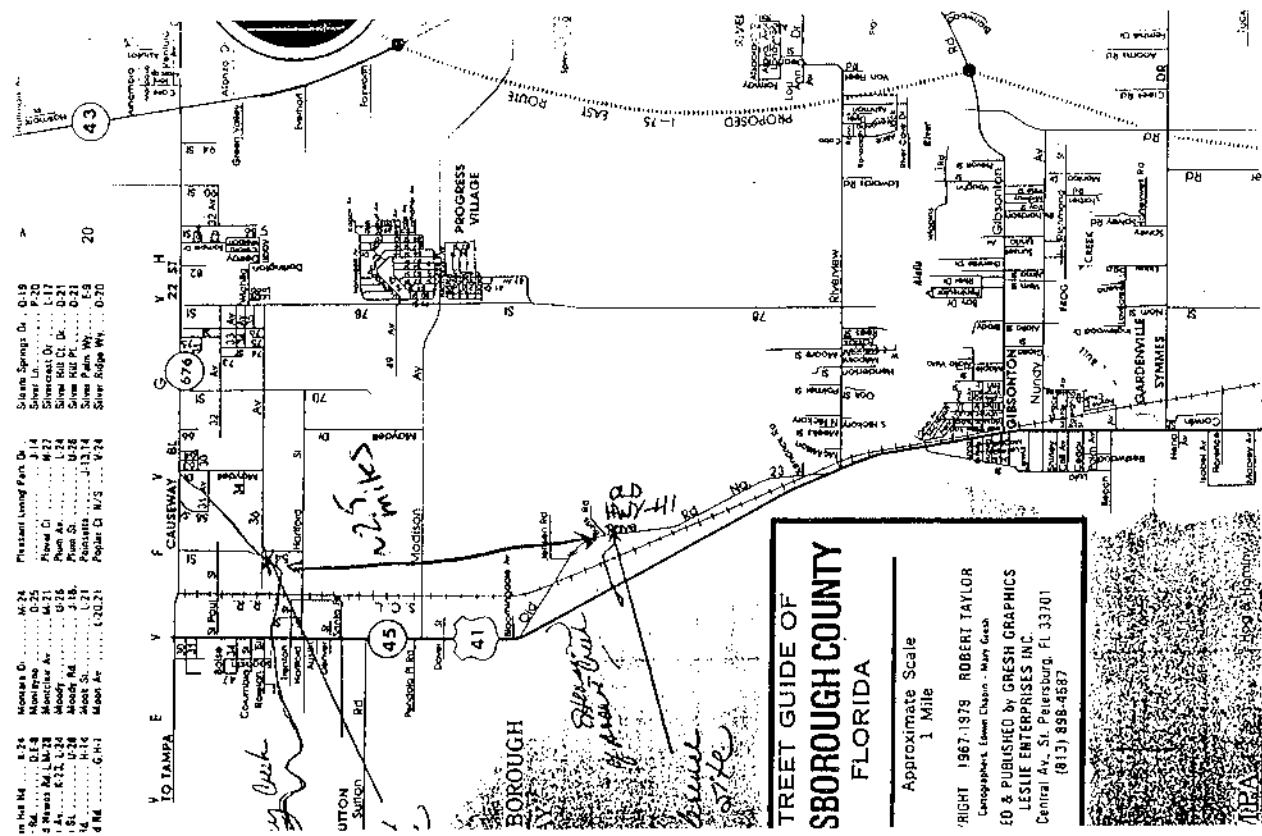
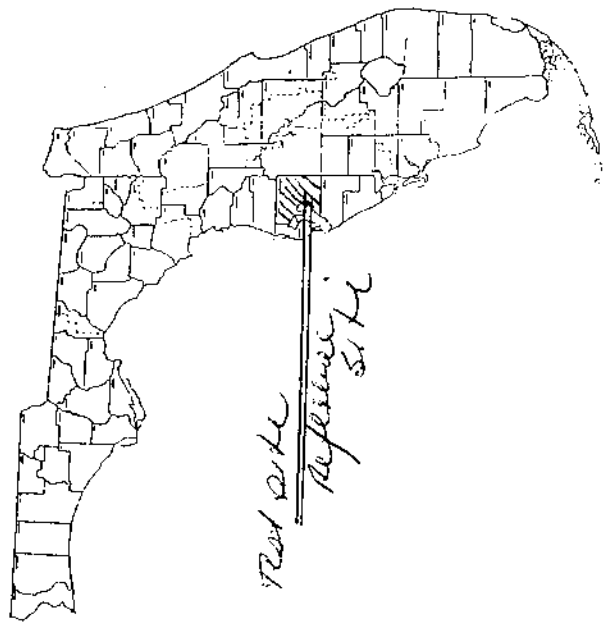
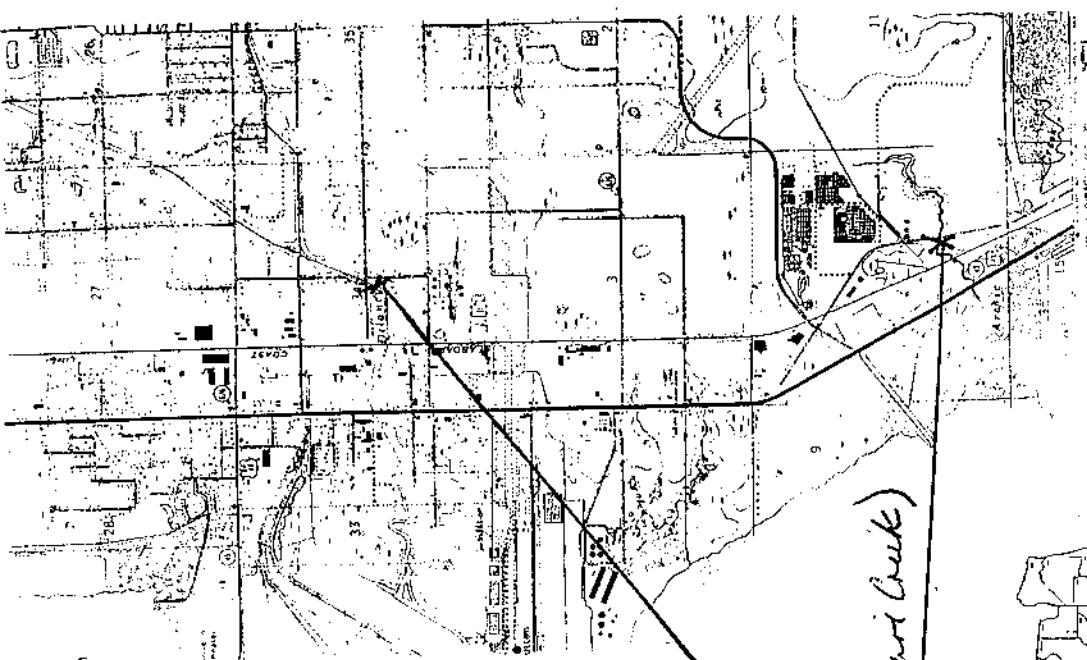
*NITRAM INC.  
 5 year projection  
 flow and location  
 site locations*

*West side  
 (Selaney Creek)*

*Referser site  
 (Banks off Aroni Creek)*

*Rest site  
 Referser site*

*Hillsborough County*



**TREET GUIDE OF  
 SBOROUGH COUNTY  
 FLORIDA**

Approximate Scale  
 1 Mile

RIGHT 1967-1979 ROBERT TAYLOR  
 Cartographers, Lower Chasin - Mary Gresh  
 ED & PUBLISHED BY GRESH GRAPHICS  
 LESLIE ENTERPRISES INC.  
 Central Av., St. Petersburg, FL 33701  
 (813) 898-4687

- Monard D. 0-24
- Montrose 0-28
- Montrose 0-30
- Montrose 0-32
- Montrose 0-34
- Montrose 0-36
- Montrose 0-38
- Montrose 0-40
- Montrose 0-42
- Montrose 0-44
- Montrose 0-46
- Montrose 0-48
- Montrose 0-50
- Montrose 0-52
- Montrose 0-54
- Montrose 0-56
- Montrose 0-58
- Montrose 0-60
- Montrose 0-62
- Montrose 0-64
- Montrose 0-66
- Montrose 0-68
- Montrose 0-70

- Present Living Part. D.
- Phon. C.
- Phon. A.
- Phon. B.
- Phon. C.
- Phon. D.
- Phon. E.
- Phon. F.
- Phon. G.
- Phon. H.
- Phon. I.
- Phon. J.
- Phon. K.
- Phon. L.
- Phon. M.
- Phon. N.
- Phon. O.
- Phon. P.
- Phon. Q.
- Phon. R.
- Phon. S.
- Phon. T.
- Phon. U.
- Phon. V.
- Phon. W.
- Phon. X.
- Phon. Y.
- Phon. Z.

STATE OF FLORIDA  
DEPARTMENT OF ENVIRONMENTAL REGULATION  
FACILITY SUMMARY

Facility Name: <u>Nitram, Inc.</u>		Prepared by: <u>Paula Noblitt</u>		
Location (attach detailed map): <u>5721 Huntford St.</u>		County: <u>Hillsborough</u>	District: <u>SWD</u>	
Federal Permit # <u>FL0001643</u> and expiration date: <del>4/30/90</del> <u>6/96</u>	State GMS # and <u>4029P20054</u> State expiration date: <u>1029-171707A exp. 5/14/95</u>	Facility Type: <u>Industrial</u> Municipal Federal Agricultural Other (list):		
Function of facility: <u>Manufacture of solid ammonium nitrate and ammonium nitrate fertilizer solutions.</u>				
Description of treatment process: <u>Plant wastewater from contained runoff areas, non-contact cooling water, boiler blowdown, condensate, demineralizer regenerant are all combined in a mix tank for aeration and pH adjustment prior to discharge to the lined pond or Delaney Creek. A hyacinth pond receives cooling tower blowdown and/or wastewater from the lined pond prior to pumping to the mix tank (this pond is also lined). Mix tank wastewater goes to effluent pump tank</u>				
Receiving waters: <u>Delaney Creek</u>		Classification: <u>III</u>		
Design Flow: <u>1.0 MGD max</u>		Actual Mean Flow: <u>0.382 MGD</u>		
Discharge is: <u>Continuous</u> Intermittent Seasonal Rainfall dependent Other (describe) therefore, the best time to sample is:				
If facility has a mixing zone, give details (size, parameters affected, etc.):  <u>N/A</u>				
List effluent limits:			Describe special permit conditions and permit modifications:	
Parameter	daily max	monthly avg Limit (units)		daily min.
Tot. N. concentration (mg/l)	12	7	—	*150, 50
Tot. N. Load (lb/day)	50	25	—	
TSS (mg/l)	20	—	—	
Tot. Ammonia Nitrogen (mg/l)	—	—	—	
Tot. Phosphorus (mg/l)	—	—	—	
Unionized Ammonia (mg/l)	0.02	—	—	
Temp. (°F)	90°	—	—	
pH (std. un)	8.5	—	6.0	
DO (mg/l)	—	—	6.0	
S.C. (umh/cm)	—	—	—	

Nitram, Inc,  
(Facility)

STATE OF FLORIDA  
DEPARTMENT OF ENVIRONMENTAL REGULATION  
FACILITY SUMMARY

Description of permitted outfall(s): From influent pump tank, wastewater is discharged via a 1300' pipeline to Delaney Creek at 36th Ave + 54th St. The pipeline is buried. Outfall 001 is located after final treatment but prior to discharge. See attached Diagram

List permit violations (from MOR data or other source) and plant upsets that occurred within past year: No MOR surface water violations in last yr. (pH too low in 6/92, 8/92)

Spill of ammonium nitrate, <sup>~5700 gallons</sup> into the ground in March 1993. Spill did not enter surface water

Describe previous impact bioassessments, WQBEL's, and previous or current enforcement actions:

Current enforcement actions consist of OGC # 87-0581. This Consent Order was for past surface water quality violations and current groundwater violations. Ground water violations include Nitrate, Nitrite, Gross Alpha.

Discuss comparability of MOR results to past DER results and whether there are trends (improving, declining) in the data set:

Additional information:

PERMITTEE:  
NITRAM, INCORPORATED

GMS ID No. 40291  
Permit No.: 1029

SPECIFIC CONDITIONS (cont'd):

14.b. TABLE I: Effluent Monitoring Requirements for Station 001

EFFLUENT CHARACTERISTIC	DISCHARGE LIMITATIONS			MONITORING REQUIREMENT SAMPLING FREQUENCY
	DAILY MAX	MONTHLY AVG	DAILY MIN	
FLOW (MGD)	1.0	0.432	N/A	Recorder Continuous
Total Nitrogen Concentration (mg/l)	12	7	N/A	24hr/composite 1/day
Total Nitrogen Load (lbs/day)	50	25	N/A	24hr/composite 1/day
Total Suspended Solids (mg/l)	20	Report	N/A	24hr/composite 1/day
Total Ammonia Nitrogen (mg/l)	Report	Report	N/A	24hr/composite 1/day
Total Phosphorus (mg/l)	Report	Report	N/A	24hr/composite 1/day
Unionized Ammonia (mg/l)	~ 0.02	Report	N/A	Calculation 1/day
Temperature, °F	90.0	Report	N/A	In-situ 1/day
pH (std un)	8.5	Report	6.0	Recorder Continuous
Dissolved Oxygen (mg/l)	~ N/A	Report	6.0	Grab 1/day
Specific Conductivity (umh/cm)	Report	Report	N/A	Grab 1/day
*Lined Pond Water Level (Feet)	Report	Report	Report	Gauge 1/day
*Lined Pond Available Capacity (inches of rainfall)	Report	Report	Report	Calculation Daily
*Lined Pond Available Capacity (gallons)	Report	Report	Report	Calculation Daily
Prilling Towers (Hrs. Operated)	Report	Report	N/A	Logs Daily

\* Refers to the emergency overflow pond.

TO  
DELANEY CREEK

⑤  
001

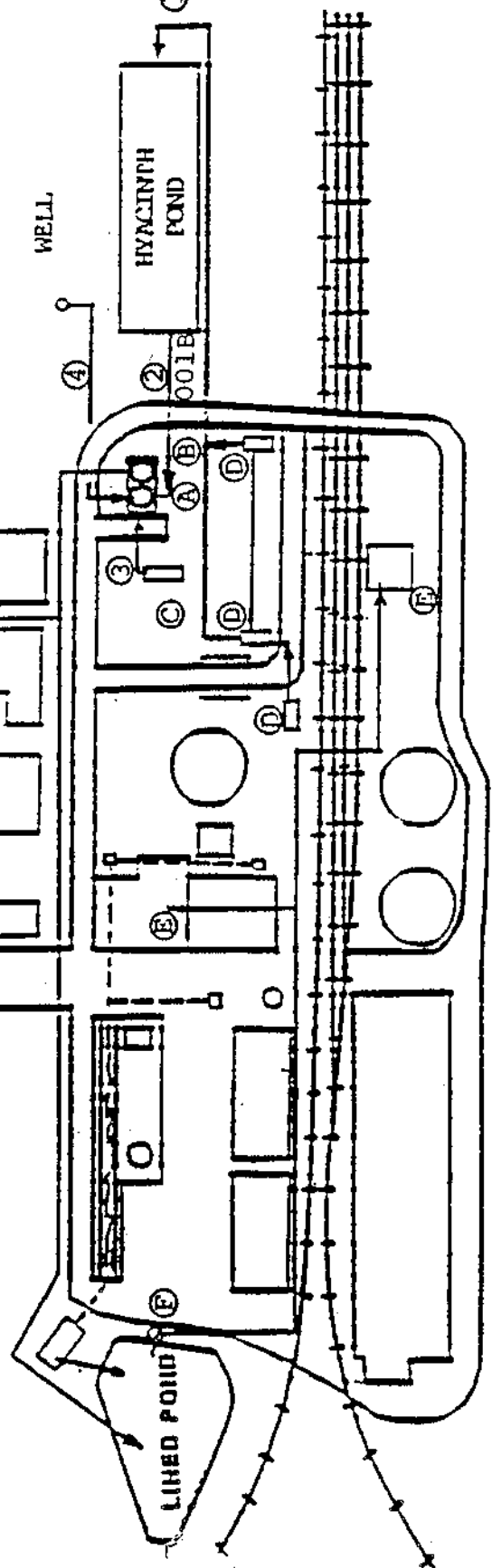
HARTFORD STREET

WELL

HYACINTH  
POND

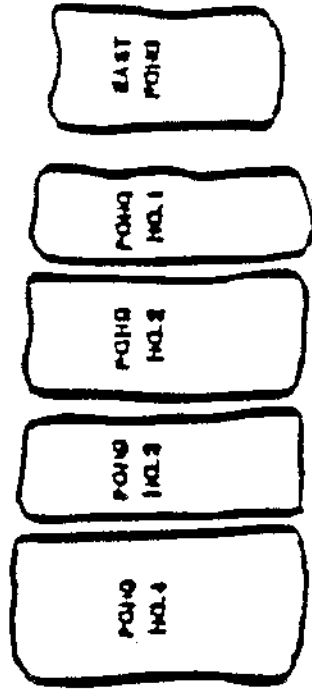
①  
001A

④  
001B



- A - EFFLUENT MIX TANK
- B - EFFLUENT PUMP TANK
- C - DEMINERALIZERS
- D - COOLING TOWERS
- E - RETURNS TO PROCESS
- F - LINED POND RECLAIM PUMP

- 1. COOLING TOWER BLOWDOWN
- 2. HYACINTH POND DISCHARGE
- 3. DEMINERALIZER REGENERANT
- 4. WATERS & AREA DRAINAGE
- 5. WELL WATER
- 6. PLANT EFFLUENT



*David Wilson*  
PLOT 29525  
11/10/85

NITRAM, INC.  
EFFLUENT SYSTEM  
LOCATION DIAGRAM

**STATE OF FLORIDA**  
**DEPARTMENT OF ENVIRONMENTAL REGULATION**  
**MARINE BENTHIC HABITAT ASSESSMENT FIELD DATA SHEET**

SUBMITTING AGENCY CODE: _____	STORET STATION NUMBER: _____	DATE (M/D/Y): <u>5/2/94</u>	RECEIVING BODY OF WATER: <u>Hillsborough Bay</u>
SUBMITTING AGENCY NAME: _____			

REMARKS: <u>killifish + Fiddler Crabs</u>	LOCATION: <u>Archie Creek</u>	FIELD ID/NAME: <u>Reference Site</u>
---	-------------------------------	--------------------------------------

Habitat Parameter <b>score</b>	Excellent	Good	Fair	Poor
<b>Littoral Alterations</b> <u>9</u>	None—Unaltered shoreline. 9-10 points	Mostly natural shoreline, but with occasional riprap. 6-8 points	Shoreline consisting mostly of riprap and vertical seawalls. 3-5 points	Shoreline consisting almost entirely of vertical seawalls. 0-2 points
<b>Community Types Observed</b> <u>20</u>	At least four communities observed from the following list: mangrove swamp, marsh, oyster bar, grass bed, reef, saltern, natural beach, or tidal creek. 38-50 points	Two or three communities observed from those listed. 26-37 points	One community observed from those listed. 13-25 points	No communities observed from those listed. 0-12 points
<b>Tidal Fluctuation</b> <u>2</u>	>0.75 m. 4-5 points	0.5 - 0.75 m. 3 points	0.25 - 0.5 m. 2 points	<0.25 m. 0-1 point
<b>Freshwater Discharges/Alterations</b> <u>6</u>	Only natural runoff. 9-10 points	Mostly natural runoff, but with a few, small stormwater sources. 6-8 points	Considerable stormwater discharge from local roads, parking lots, etc. 3-5 points	Extensive manmade discharges, especially from canals draining large tracts of land. 0-2 points
<b>Flow and Wave Action</b> <u>10</u>	Light to moderate wave action present except under the harshest weather conditions. Flow unrestricted by manmade structures. 9-10 points	—————	—————	Heavy wave action sometimes present even during average weather conditions, or flow restricted by manmade structures so that velocities are very high. 0-2 points
<b>Sediment Type</b> <u>8</u>	Combination of sand, gravel, and shell. 12-15 points	Primarily sand, with small areas of mud. 8-11 points	Mixture of sand and mud, or well-aerated mud only. 4-7 points	Anaerobic mud. 0-3 points

TOTAL SCORE <u>55</u>
-----------------------

COMMENTS: <u>Oligohaline - Tidal Creek w/ Canopy of Live Oak, Brazilian Pepper + Palm Trees. Sampled at slack high tide.</u>
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ANALYSIS DATE: <u>5/2/94</u>	ANALYST: <u>Fricano</u>	SIGNATURE: <u>Pat Givanni</u>
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STATE OF FLORIDA  
DEPARTMENT OF ENVIRONMENTAL REGULATION

PHYSICAL/CHEMICAL CHARACTERIZATION FIELD DATA SHEET (Version 4)

SUBMITTING AGENCY CODE: _____	STORET STATION NUMBER: _____	DATE (M/D/Y): <u>5/2/94</u>	TIME: <u>1:15 pm</u>	RECEIVING BODY OF WATER: <u>Hillsborough Bay</u>
SUBMITTING AGENCY NAME: _____				

REMARKS: <u>Tidal Creek, near East Bay Raceway + Junk Yard Old Hwy 41 and Burts Rd</u>	LOCATION: <u>Archie Creek</u>	FIELD ID/NAME: <u>Reference Site</u>
--	-------------------------------	--------------------------------------

**RIPARIAN ZONE/INSTREAM FEATURES**

Predominant Surrounding Land-Use (specify relative percent in each category): Vacant Land w/trees  
Brazilian Pecan + garbanos

Forest	Field/Pasture	Agricultural	Residential	Commercial	Industrial	Other (Specify)
[ ]	[ ]	[ ]	[ ]	[ ]	<u>50</u>	<u>50</u>

Local Watershed Erosion (check box): None  Moderate  Heavy

Local Watershed NPS Pollution (check box): No evidence  Some potential sources  Obvious sources

Point-Source Pollution (list location and describe):

Estimated System Width (range, m): <u>10</u>	Estimated System Depth (range, m): <u>.5</u>	Impounded <input type="checkbox"/>
High Water Mark (m above bed): <u>1.5</u>	Velocity (range, m/s): <u>0</u>	Channelized <input type="checkbox"/>
Canopy Cover % : Open : <input type="checkbox"/> Lightly Shaded (11-45%): <input type="checkbox"/> Moderately Shaded (46-80%): <input checked="" type="checkbox"/> Heavily Shaded: <input type="checkbox"/>		

**SEDIMENT/SUBSTRATE**

Sediment Odors: Normal:  Sewage:  Petroleum:  Chemical:  Anaerobic:  Other:

Sediment Oils: Absent:  Slight:  Moderate:  Profuse:

Sediment Deposits: Sludge:  Paper Fiber:  Mud:  Sand:  Shell:  Other:

Substrate Types	% coverage	# times sampled	method	Substrate Types	% coverage	# times sampled	method
Woody Debris (Snags)	[ ]	[ ]	[ ]	Riffles	[ ]	[ ]	[ ]
Leaf Packs	[ ]	[ ]	[ ]	Sand	[ ]	[ ]	[ ]
Aquatic Vegetation	[ ]	[ ]	[ ]	Mud/Muck/Silt/Sand	<u>100</u>	<u>20</u>	[ ]
Rock or Shell Rubble	[ ]	[ ]	[ ]	Benthic leaf mats	[ ]	[ ]	[ ]
Undercut Banks/Roots	[ ]	[ ]	[ ]	Other:	[ ]	[ ]	[ ]

**WATER QUALITY**

	Depth (m):	Temp. (°C):	pH (SU):	D.O. (mg/l):	Cond. (µmho/cm):	Secchi (m):
Top	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Mid-depth	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Bottom	[ ]	[ ]	[ ]	[ ]	[ ]	<u>Bottom</u> <u>5.01</u>

System Type : Stream:  Sand Bottomed Swamp & Bog Alluvial Lake:  Wetland:  Estuary:  Other:   
 Sand Bot w/ Spring Calcareous Misc.)

Water Odors (check box): Normal:  Sewage:  Petroleum:  Chemical:  Other:

Water Surface Oils (check box): None:  Sheen:  Globbs:  Slick:  High Tide

Clarity (check box): Clear:  Slightly turbid:  Turbid:  Opaque:

Color (check box): Tannic:  Green (algae):  Clear:  Other:

Weather Conditions: <u>Partly Cloudy</u> <u>Hot 85+</u>	Abundance:				
	Periphyton	Absent <input checked="" type="checkbox"/>	Rare <input type="checkbox"/>	Common <input type="checkbox"/>	Abundant <input type="checkbox"/>
	Fish	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Abundant <input checked="" type="checkbox"/>
	Aquatic Macrophytes	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Iron/sulfur Bacteria	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

SAMPLING TEAM: <u>Fortmann, Schulze, Conker</u>	SIGNATURE: <u>Tom Luciano</u>	DATE: _____
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**STATE OF FLORIDA  
DEPARTMENT OF ENVIRONMENTAL REGULATION  
MARINE BENTHIC HABITAT ASSESSMENT FIELD DATA SHEET**

SUBMITTING AGENCY CODE: _____	STORET STATION NUMBER: _____	DATE (M/D/Y): <u>5/2/94</u>	RECEIVING BODY OF WATER: <u>Hillsborough Bay</u>
SUBMITTING AGENCY NAME: _____			

REMARKS: <u>Dead Armadillo, Live Blue Crab</u>	LOCATION: <u>Delaney Creek</u>	FIELD ID/NAME: <u>1001</u>
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Habitat Parameter score	Excellent	Good	Fair	Poor
<b>Littoral Alterations</b> [ ]	None—Unaltered shoreline. 9-10 points	Mostly natural shoreline, but with occasional riprap. 6-8 points	Shoreline consisting mostly of riprap and vertical seawalls. 3-5 points	Shoreline consisting almost entirely of vertical seawalls. 0-2 points
<b>Community Types Observed</b> [ 2 ]	At least four communities observed from the following list: mangrove swamp, marsh, oyster bar, grass bed, reef, saltern, natural beach, or tidal creek. 38-50 points	Two or three communities observed from those listed. 26-37 points	One community observed from those listed. 13-25 points	No communities observed from those listed. 0-12 points
<b>Tidal Fluctuation</b> [ 1 ]	>0.75 m. 4-5 points	0.5 - 0.75 m. 3 points	0.25 - 0.5 m. 2 points	<0.25 m. 0-1 point
<b>Freshwater Discharges/Alterations</b> [ 5 ]	Only natural runoff. 9-10 points	Mostly natural runoff, but with a few, small stormwater sources. 6-8 points	Considerable stormwater discharge from local roads, parking lots, etc. 3-5 points	Extensive manmade discharges, especially from canals draining large tracts of land. 0-2 points
<b>Flow and Wave Action</b> [ 9 ]	Light to moderate wave action present except under the harshest weather conditions. Flow unrestricted by manmade structures. 9-10 points	—	—	Heavy wave action sometimes present even during average weather conditions, or flow restricted by manmade structures so that velocities are very high. 0-2 points
<b>Sediment Type</b> [ 6 ]	Combination of sand, gravel, and shell. 12-15 points	Primarily sand, with small areas of mud. 8-11 points	Mixture of sand and mud, or well-aerated mud only. 4-7 points	Anaerobic mud. 0-3 points

<b>TOTAL SCORE</b> [ 51 ]
---------------------------

COMMENTS: <u>Dead Armadillo, Blue Crab - 0/13/94 Hillsborough Bay Creek - mangrove vegetation still present - live blue crabs observed</u>
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ANALYSIS DATE: <u>5/2/94</u>	ANALYST: <u>Fricano</u>	SIGNATURE: <u>FAT Fricano</u>
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STATE OF FLORIDA  
DEPARTMENT OF ENVIRONMENTAL REGULATION

PHYSICAL/CHEMICAL CHARACTERIZATION FIELD DATA SHEET (Version 4)

SUBMITTING AGENCY CODE: _____	STORET STATION NUMBER: _____	DATE (M/D/Y): <u>5-18-94</u>	TIME: <u>10:40 AM</u>	RECEIVING BODY OF WATER: <u>Hillsborough Bay</u>
SUBMITTING AGENCY NAME: _____				

REMARKS: <u>Chylo helix field creek</u> <u>immediately above culvert &amp; culvert</u> <u>bed is concrete</u>	LOCATION: <u>Delaney Creek</u>	FIELD ID/NAME: <u>10-7-35</u>
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RIPARIAN ZONE/INSTREAM FEATURES

Predominant Surrounding Land-Use (specify relative percent in each category):

Forest <input type="checkbox"/>	Field/Pasture <input type="checkbox"/>	Agricultural <input type="checkbox"/>	Residential <input checked="" type="checkbox"/>	Commercial <input type="checkbox"/>	Industrial <input type="checkbox"/>	Other (Specify) <input type="checkbox"/>
---------------------------------	--	---------------------------------------	---	-------------------------------------	-------------------------------------	--

Local Watershed Erosion (check box): None  Moderate  Heavy

Local Watershed NPS Pollution (check box): No evidence  Some potential sources  Obvious sources

Point-Source Pollution (list location and describe):  
N/A

Estimated System Width (range, m): <input type="checkbox"/>	Estimated System Depth (range, m): <input type="checkbox"/>	yes <input type="checkbox"/>
High Water Mark (m above bed): <input type="checkbox"/>	Velocity (range, m/s): <input type="checkbox"/>	Impounded <input type="checkbox"/>
		Channelized <input type="checkbox"/>

Canopy Cover % : Open :  Lightly Shaded (11-45%):  Moderately Shaded (46-80%):  Heavily Shaded:

SEDIMENT/SUBSTRATE

Sediment Odors: Normal:  Sewage:  Petroleum:  Chemical:  Anaerobic:  Other:

Sediment Oils: Absent:  Slight:  Moderate:  Profuse:

Sediment Deposits: Sludge:  Paper Fiber:  Mud:  Sand:  Shell:  Other:

Substrate Types	% coverage	# times sampled	method	Substrate Types	% coverage	# times sampled	method
Woody Debris (Snags)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Riffles	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Leaf Packs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sand / Mud / silt	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Aquatic Vegetation	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Mud/Muck/Silt	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Rock or Shell Rubble	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Benthic leaf mats	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Undercut Banks/Roots	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Other:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

WATER QUALITY

	Depth (m):	Temp. (°C):	pH (SU):	D.O. (mg/l):	Cond. (µmho/cm):		Secchi (m):
Top	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>Bottom</u> <u>3.1m</u>
Mid-depth	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Bottom	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

System Type : Stream:  Sand Bottomed Swamp & Bog Alluvial  
 Sand Bot w/ Spring Calcareous Misc.) Lake:  Wetland:  Estuary:  Other:

Water Odors (check box): Normal:  Sewage:  Petroleum:  Chemical:  Other:

Water Surface Oils (check box): None:  Sheen:  Globbs:  Slick:

Clarity (check box): Clear:  Slightly turbid:  Turbid:  Opaque:

Color (check box): Tannic:  Green (algae):  Clear:  Other:

Weather Conditions:	Abundance:	Absent	Rare	Common	Abundant
<u>Sunny + Hot 83+</u>	Periphyton	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Fish	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	Aquatic Macrophytes	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	Iron/sulfur Bacteria	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

SAMPLING TEAM: <u>Prichard, Schulze, Carter</u>	SIGNATURE: <u>Tat Fricano</u>	DATE: <u>5/2/94</u>
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# FDEP Biology Section — Acute Bioassay Bench Sheet

Sample Source: Nitram Inc.  
 Location: \_\_\_\_\_  
 County: Hillsborough  
 Contact/District: Pat Fricano/SW  
 NPDES Permit #: FL00011643 Outfall #: \_\_\_\_\_

Sample Collection: Date 5/2/94 Time 10:15  
 Test Beginning: Date 5/3/94 Time 1400  
 Test Ending: Date 5/5/94 Time 1345  
 Organism Batch #: 110 Diluent Batch #: \_\_\_\_\_  
 Organism Age: 13 days old  
 Test Organism: Menidia beryllina

Test Type: (Screening) Definitive  
(Static) Static Renewal | Flow-through Instrument

Calibrations: pH meter # 7851 Temperature °C 90H018262 D.O. mg/L 90H018262 Conductivity μmhos/cm G9005749

Test Number: 2 of 2 Initial parameters: pH: 6.7 Temp: 22.1 0 hr 7.0@7.0 23.9@24.0 8.5@23.5 980@1,000  
 Remarks: Control water made with well water and 40F salts (TO 1.88/100) D.O.: 8.5 9.0@9.0 9770@10,000@24.0°C  
Effluent salinity was not adjusted. Conductivity: 3.36 7.0@7.0 23.8@23.9 8.3@24.7 975@1,000  
 millimhos/cm @ 24 hr 9.0@9.0 9780@10,000@23.8°C  
 48 hr 7.0@7.0 23.5@23.6 8.4@24.0 980@1,000  
9.0@9.0 9750@10,000@24.1°C

Conc.	Chamber #	Number Live			pH			Temperature (°C)			D.O. (mg/L)			UNCORRECTED Cond. (mmhos/cm) Cond. (μmhos/cm)		
		0 hr	24 h	48 h	0 hr	24 h	48 h	0 hr	24 h	48 h	0 hr	24 h	48 h	0 hr	24 h	48 h
Control A	15	5	5	5	7.8	8.2	8.3	23.1	23.7	23.7	8.9	8.0	7.7	3.40	3.55	3.61
Control B	348	5	5	5	7.8	8.2	8.3			23.6	8.9	8.0	7.7	3.40	3.48	3.51
100% A	630	5	5	5	6.9	7.8	8.1	22.8	23.6	23.9	9.1	8.1	7.8	3.41	3.55	3.61
100% B	147	5	5	5	6.9	7.8	8.1			23.6	9.0	8.1	7.7	3.40	3.55	3.58

Measured/Loaded by: MF TM TM MF TM MF MF TM MF MF TM MF TM MF TM MF TM MF TM MF TM  
 Recorded by: TM TM TM TM MF TM TM MF TM TM MF TM TM MF TM TM MF TM TM MF TM

## Investigators' Signatures

Tina Mikhelelis  
Marshall Fardeth  
 \_\_\_\_\_  
 Reviewer

## Salt Water/

## Water Quality Parameters

	Well Water	20% Min Water	Sample	Method	Measured by
Field Total Residual Cl <sub>2</sub> :			0	—	SS/LC
Lab Total Residual Cl <sub>2</sub> :	<0.03	<0.03	<0.03	DR-100	TM
Alkalinity:	110	—	100	titr	TM
Hardness:	—	—	—	titr	TM
Total Ammonia:	<0.017	—	0.184	orion	MF

Ammonia Ammonia Ammonia Control  
 Meter #98136 Meter Slope: -57.8 Blank: <0.017 Salinity: 1.86 ppt Sample Salinity: 1.86 ppt

FDER BIOLOGY SECTION — ACUTE BIOASSAY DATA SHEET

Sample Source: Nitram Inc.  
 Location: \_\_\_\_\_  
 County: Hillsborough  
 Contact/District: Pat Ericano / SW  
 NPDES Permit #: FL0001643 Outfall #: \_\_\_\_\_

Sample Collection: Date 5/2/94 Time 10:15  
 Test Beginning: Date 5/3/94 Time 1400  
 Test Ending: Date 5/5/94 Time 1345  
 Organism Batch #: 17 Diluent Batch #: \_\_\_\_\_  
 Organism Age: 4 days old

Test Type: Screening Definitive  
Static Static Renewal | Flow-through Instrument  
 Callibrations: pH Temperature °C D.O. mg/L Conductivity µmhos/cm  
 meter # 7851 90P018262 90H018262 G9005749

Test Number: 1 of 2 Initial parameters:  
 pH: 6.7  
 Temp: 22.1  
 D.O.: 8.5  
 cond: 3.36 millimhos  
 millimhos  
 Remarks: Control water made with well water and 40F salts. (TO 5%)  
Effluent salinity adjusted to 5‰ with same 40F salts.

0 hr 7.0 @ 7.0 23.9 @ 24.0 8.5 @ 23.5 980 @ 1,000  
9.0 @ 9.0 9770 @ 10,000 @ 24.0 °C  
 24 hr 7.0 @ 7.0 23.8 @ 23.9 8.3 @ 24.7 975 @ 1,000  
9.0 @ 9.0 9720 @ 10,000 @ 23.8 °C  
 48 hr 7.0 @ 7.0 23.5 @ 23.6 8.4 @ 24.0 980 @ 1,000  
9.0 @ 9.0 9750 @ 10,000 @ 24.1 °C

Conc.	Chamber #	Number Live			pH			Temperature (°C)			D.O. (mg/L)			UNCORRECTED Cond. (mmhos/cm) Cond. (µmhos/cm)		
		0 hr	24 h	48 h	0 hr	24 h	48 h	0 hr	24 h	48 h	0 hr	24 h	48 h	0 hr	24 h	48 h
Control A	74	5	5	5	8.0	8.2	8.3	22.8	23.7	23.8	8.4	7.3	7.8	8.51	8.80	8.89
Control B	22	5	5	5	8.0	8.2	8.3			23.7	8.4	7.4	7.7	8.51	8.82	8.88
100%A	219	5	3	2	7.0	7.8	8.1	22.8	23.7	23.6	8.6	7.4	7.7	8.58	8.89	8.94
100%B	4	5	2	2	7.0	7.8	8.1			23.5	8.5	7.4	7.7	8.53	8.84	8.89

Measured/Loaded by: MF TM JM MF TM MF MF TM MF MF MF TM MF MF TM MF TM MF  
 Recorded by: TM TM JM TM MF TM TM MF TM TM MF TM TM MF TM TM MF TM

Investigators' Signatures  
Tina Mikhailoli  
Marshall Faircloth  
 \_\_\_\_\_  
 Reviewer

Well Water	20% Min Water	Sample	Method	Measured by	Salt Water/	
					Ammonia	Ammonia
Field Total Residual Cl <sub>2</sub> :		0	—	SS/LC	Ammonia	Control
Lab Total Residual Cl <sub>2</sub> :	<0.03	<0.03	<0.03	DR-100	Ammonia	Sample
Alkalinity:	130	—	100	Hach	Meter #98136	Meter Slope: -57.8
Hardness:	—	—	—	Hach	Blank: <0.017	Salinity: 5.0 ppt
Total Ammonia:	<0.017	—	0.184	ona	Salinity: 5.0 ppt	

Benthic macroinvertebrate taxa list for Nitram Inc., collected via 3 Ponar grab samples per site in Delaney Ck. (test site) and Archie Ck. (reference site), on 2 May, 1994. Densities, in number/m<sup>2</sup>, represent the mean of the three replicates.

	Reference Site	Test Site
<b>Amphipoda</b>		
<i>Corophium louisianum</i>	786	—
<i>Grandidierella bonnieroides</i>	3543	62
<b>Coleoptera</b>		
<i>Dubiraphia</i> sp.	—	25
<i>Stenelmis</i> sp.	—	25
<b>Cumacea</b>		
<i>Almyracuma</i> sp.	12	237
<b>Diptera</b>		
<i>Chironomus</i> sp.	—	37
<i>Coelotanytus tricolor</i>	12	—
<i>Dicrotendipes lobus</i>	125	—
<i>Dicrotendipes modestus</i>	—	312
<i>Dicrotendipes neomodestus</i>	—	162
<i>Polypedilum halterale</i> grp.	—	337
<i>Polypedilum scalaenum</i> grp.	125	175
<i>Polypedilum</i> sp. A Epler	—	12
<i>Polypedilum</i> sp.	—	25
<i>Procladius</i> sp.	—	137
Undetermined dipteran pupae	—	200
<i>Tanytarsus</i> sp. G Epler	—	1185
<b>Gastropoda</b>		
<i>Littoridinops palustris</i>	374	200
<b>Hirudinea</b>		
<i>Myzobdella lugubris</i>	—	12
<b>Isopoda</b>		
<i>Cyathura polita</i>	424	424
<i>Idotea metallica</i> ?	37	—
<i>Idotea</i> sp.	12	—
<i>Uromunna reynoldsi</i>	—	125
<b>Odonata</b>		
<i>Epitheca princeps</i>	—	12
<b>Oligochaeta</b>		
<i>Limnodrilus hoffmeisteri</i>	25	1085
<b>Pelecypoda</b>		
<i>Corbicula manilensis</i>	—	324
<i>Polymesoda caroliniana</i>	12	—
Undetermined Pelecypoda	25	—
<b>Polychaeta</b>		
<i>Laeonereis culveri</i>	2919	1198
<i>Polydora socialis</i>	—	87
<i>Streblospio benedicti</i>	12	—
Undetermined Spionidae	12	—
<b>Total</b>	<b>8455</b>	<b>6398</b>

Phytoplankton taxa list and densities (#/mL) for Nitram Inc., collected via subsurface grabs in Hillsborough Bay on 2 May, 1994.

	Reference Site	Test Site
<b>Diatoms</b>		
<i>Amphora</i> sp.	68	684
<i>Bacillaria</i> sp.	–	68
<i>Cyclotella</i> sp.	136	–
<i>Cymbella</i> sp.	–	205
<i>Entomoneis</i> sp.	–	68
<i>Gyrosigma</i> sp.	–	137
<i>Navicula</i> sp.	1086	479
<i>Nitzschia longissima</i>	–	547
<i>Nitzschia</i> sp.	407	889
Unidentified pennate diatom	–	342
<b>Chlorophyta</b>		
<i>Chlamydomonas</i> sp.	814	205
<i>Scenedesmus</i> sp.	68	–
<i>Tetraedron</i> sp.	136	–
Unknown chlorophyte flagellate	68	–
<b>Chrysophyta</b>		
<i>Mallomonas</i> sp.	–	68
<b>Cyanophyta</b>		
<i>Chroococcus</i> sp.	136	–
<i>Dactylococcopsis</i> sp.	68	–
<i>Microcystis</i> sp.	68	68
<b>Pyrrophyta</b>		
Dinoflagellate cyst	68	–
<b>Total</b>	<b>3123</b>	<b>3760</b>

