Florida
Department of Environmental Protection

Biological Assessment of

Ocean Spray Citrus Packers

Indian River County

NPDES #FL0031127

Sampled December, 1993

May 1994

Biology Section
Division of Technical Services

Department of Environmental Protection
Results of Fifth Year Inspections

Discharger: Ocean Spray Citrus Packers
County: Indian River
NPDES Number: FL0031127
State Permit Expiration Date: 1 June 1994

Toxics Sampling Inspection (XSI)

Date Sampled: 13 December 1993

Results: No organic priority pollutants or metals were detected in the effluent at levels exceeding Class III standards.

Compliance Biomonitoring Inspection (CBI)

Date Sampled: 13 December 1993

Results: The sample of effluent was not toxic to the bannerfin shiner, *Cyprinella leedsi*, or to the invertebrate, *Ceriodaphnia dubia*.

Impact Bioassessment Inspection (IBI)

Date Sampled: 13 December 1993

Results: Measures of macroinvertebrate health indicated that both receiving water sites were impaired. Depressed taxa richness, very low Florida Index and EPT scores (0), and Stream Invertebrate Index for Florida (SIIF) scores in the moderately impaired range, were found at both the reference and test sites. The similarity in invertebrate populations between the two sites suggests that the discharge is having no additional adverse effects upon the receiving water biota, which were already moderately impaired due to non-point sources (landfill and agriculture). A portion of the stress seen in the receiving waters was probably associated with the low dissolved oxygen and elevated conductivity measured at both sites. The extremely high chlorophyll *a* at both sites (314.3 µg/L and 290.4 µg/L for the reference and test sites, respectively) clearly indicated that a major phytoplankton bloom was occurring. These chlorophyll *a* values are approximately six times higher than the upper 95th percentile of the chlorophyll *a* found in other Florida streams. Measures of the phytoplankton communities indicated very little difference between the two sites, both of which were typical of eutrophic conditions. Therefore, although the phytoplankton communities were stressed at both stations, the facility did not appear to be responsible.

Water Quality Inspection (WQI)

Date Sampled: 13 December 1993

Results: Dissolved oxygen at both sites was below the Class III water quality standard (Rule 17-302.530(31) FAC). Elevated nutrients were detected in the receiving waters, but non-point sources, not the facility, appeared to be responsible for the enrichment. Algal growth potential was below the 5 mg algal dry wt/L "problem threshold" at both sites. However, these AGP results must be viewed with caution, because a major algal bloom was occurring at these stations. It is possible that some sort of growth inhibition decreased the AGP results.

Introduction

Ocean Spray Citrus Packers is located in Vero Beach, Indian River County, Florida (see maps in Appendix). The facility produces citrus concentrate from single strength citrus juice. The strong waste, consisting of fruit wash, waste evaporator condensate, and plant clean-up (0.10 MGD maximum) is disposed of through an underground injection well, or spray irrigation over a 75 acre sprayfield. The weak waste, consisting of non-contact refrigerant cooling water, water softener back flush, excess well water, and plant stormwater runoff, is treated through settling and thermal cooling via an on-site accumulation pond. The discharge, averaging between 0.036 MGD and 0.065 MGD, exits into a canal, which flows approximately 3 miles prior to discharge into the Class III Indian River.

During the Florida fruit harvesting season (December through April), State permit limits for the effluent are as follows: BOD (10 mg/L), pH (6 to 8.5 S.U.'s), total residual chlorine (0.01 mg/L), hexavalent chromium (0.5 mg/L), zinc (0.5 mg/L), temperature (95° F maximum), and flow (0.09 MGD). At the time of this survey, the flow was 0.036 MGD.

There have been no problems reported for this facility. One bioassay was conducted by DER in April of 1981, and the results concluded that the effluent was not toxic. Water Quality Based Effluent Limitations were developed for this facility in 1989 (WQTS 2:117, 1989).

Major characteristics of community structure of control and test sites.

	Reference Site	Test Site
Macroinvertebrate Qualitative		
Number of Taxa	18	17
Florida Index	0	0
EPT Index	0	0
Stream Invertebrate Index for Florida	21	23
% Contribution of Dominant Taxon	20.7	21.1
% Odonata	28.8	26.3
% Diptera	23.4	15.8
% Gastropoda	18.9	42.1
% Pelecypoda	12.1	4.3
% Amphipoda	18.0	0
% Coleoptera	3.6	5.3
% Other	7.2	10.4
% Predators/ Carnivores	32.4	30.6
% Plant piercers	0.3	0.9
% Deposit feeders (above surface)/ Collector-Gatherers	19.7	9.5
% Suspension feeders/ Collector-Filterers	8.6	10.8
% Scrapers	18.9	43.2
% Shredders	11.9	2.3
% Borers	2.3	1.4
Macroinvertebrate Hester-Dendy		
Number of Taxa	0	1
Florida Index	0	0
Shannon-Weaver Diversity	0	0
% Diptera	0	100
%Deposit feeders (above surface)/ Collector-Gatherers	0	100
Periphyton Algae		
Number of Taxa	29	26
% Contribution of Dominant Taxon	25.8	32.7
Chlorophyll a (mg/sq.m)	13.4	3.3
Diatom/Diatom + B-G Abundance Ratio	.58	.95
% Blue-green	37.5	4.6
% Green	4.5	3.1
% Diatoms	52.8	91.3
% Other	5.2	1.1
Phytoplankton Algae		
Number of Taxa	22	23
% Contribution of Dominant Taxon	38.3	39.5
Chlorophyll a (µg/L)	314.3	290.4
Diatom/Diatom + B-G Abundance Ratio	.85	.81
% Blue-green	13.3	18.3
% Green	9.7	3.3
% Diatoms	75.5	78.4
% Euglenophyta	1.5	0
Algal Growth Potential (mg dry wt/L)	4.6	3.9

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 a drainage ditch upstream of the facility, and a test site (the unnamed ditch downstream of the discharge, draining to the Indian River. 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 *Ceriodaphnia dubia* and *Cyprinella leedsi* as test organisms, were performed on an effluent sample (Weber 1991). 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 from multiple substrates (*e.g.*, snags, leaf packs, vegetation) using discrete dip net sweeps. Additionally, Hester-Dendy multiplate samplers were incubated for 28 days (Ross 1990). Periphyton was sampled at both reference and test sites by incubating glass microscope slides in a standard periphytometer for 28 days (Ross 1990). Phytoplankton populations were analyzed from samples taken via subsurface grabs. Chlorophyll *a* was also determined for algal communities (Ross 1990). Algal Growth Potential tests, using *Selenastrum capricornutum* as the test organism, followed Miller *et al.* (1978).

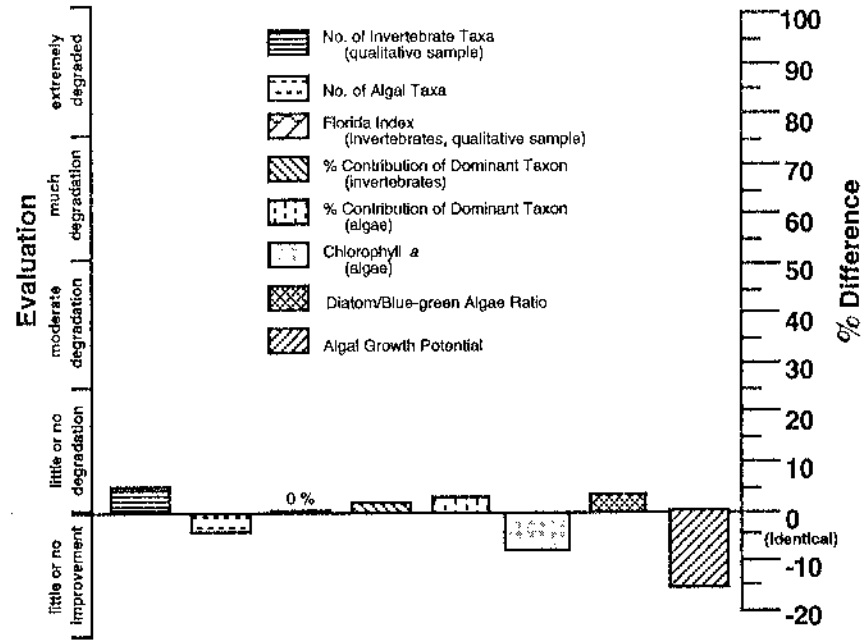
Explanation of Measurements of Community Health

Several different measurements of macroinvertebrate and algal community health have been employed in this report. Many of these, such as the number of taxa and chlorophyll *a* are well known. Others are briefly explained here. The Florida Index assigns points to stream-dwelling macroinvertebrates based on their sensitivity to pollution (see Ross 1990). A site with a high Florida Index score is considered healthy (*i.e.*, many clean-water organisms are present). The Ephemeroptera/Plecoptera/Trichoptera (EPT) Index is calculated by summing the number of distinct taxa of EPT's represented in a sample. A higher EPT Index is associated with good water quality. 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 lesser of the two percentages for each discrete taxonomic group is totaled. 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). The Stream Invertebrate Index for Florida (SIIF) is a composite metric which is based upon the macroinvertebrate communities found at Florida eco-regional reference sites sampled with dip net sweeps (EA Engineering 1994). The SIIF assigns 5, 3, or 1 point(s) to a variety of invertebrate parameters, depending on how closely that parameter approaches the expected eco-regional reference condition (5 points indicating a close match). The following parameters are used in calculating the SIIF for the Panhandle: taxa richness, EPT Index, % contribution of the dominant taxa, % Diptera, Florida Index, % suspension feeders/filterers, and % shredders (EA Engineering 1994). In the panhandle, 23-29 SIIF points indicates no impairment, 15-22 points indicates moderate impairment, and 7-14 points is clear evidence of severe degradation. In the Florida peninsula, these same parameters, along with the number of crustacean and mollusk taxa and the % of crustacean and mollusk taxa, are used to calculate the SIIF. In the Peninsula, 27-33 SIIF points indicates no impairment, 17-26 points indicates moderate impairment, and 9-16 points is evidence of severe degradation.

For graphical purposes, the percent differences between the reference and test sites involving the number of taxa, Florida 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 differences between sites involving the percent contribution of dominant taxon, chlorophyll *a*, 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: Phil Kane and Clayton Smith, (DEP Central District) and Chris Barge, Lyn Burton, Marshall Faircloth, Russel Frydenborg, Christy LeDuc, Kathleen Lurding, Elizabeth Miller, Urania Quintana, Landon Ross, Greg Wynn, and David Young (Tallahassee Biology Laboratory). The report was reviewed by the Point Source Bioassessment Review Committee, consisting of Jan Mandrup-Poulsen, Wayne Magley, and Mike Tanski, as well as District representatives.



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

Results

Habitat at the sampling sites was extremely similar, with the reference and test sites both scoring 48 points. Each site had an ample coverage of substrates (*i.e.*, snags, roots, leaf packs, and emergent vegetation) for benthic community success. Land near the study area was used for waste disposal (a county landfill made up 50% of the surrounding area), as well as for agricultural (25%) and industrial (25%) purposes. Both sites were situated in a heavily vegetated drainage ditch with negligible water velocity (less than 0.025 m/sec). The ditch drains water from Indian River Farms (an orange grove) to the Indian River.

Temperature increased slightly from reference site to test site, 12.3° C to 13.5° C, respectively. The pH at each site was circum-neutral (7.2 at the reference site and 7.4 at the test site). Conductivity was very elevated at both sites, increasing from 2370 µmhos/cm at the reference site to 2590 µmhos/cm at the test site. At this conductivity, stress to freshwater benthic communities (difficulties with osmoregulation) is very probable. Dissolved oxygen was very low at the reference site (2.4 mg/L), while it was somewhat higher (3.7 mg/L) at the test site. Dissolved oxygen at both sites was below Class III water quality standards (Rule 17-302.510(3)(g) FAC). Conversely, BOD decreased from 4.3 mg/L (reference site) to 2.4 mg/L (test site). TSS at the reference site was 13.2 mg/L, decreasing to 4.9 mg/L at the test site.

The effluent sample was not toxic to the water flea, *Ceriodaphnia dubia*, or to the fish, *Cyprinella leedsi*, exposed to the full strength sample.

No organic pollutants or metals were detected in the discharge at levels above quantitation limits.

Although nutrient enrichment was apparent in the receiving waters, the facility did not appear to be responsible. Ammonia levels increased from 0.09 mg/L (the reference site) to 0.27 mg/L (the test site). However, ammonia contamination was confirmed in the trip blank, suggesting that the elevated ammonia level was due to factors other than the effluent. TKN was undetected at the upstream site, increasing to 2.6 mg/L at the downstream site, which is higher than that found in 93% of other Florida streams (see Table of Typical Water Quality Values in Appendix). Nitrate-nitrite levels were 2.4 mg/L at the reference site (much higher than the 95th percentile), decreasing to 0.07 mg/L (40th percentile) at the test site. Elevated nitrate-nitrite at the background site suggests non-point source runoff from the orange groves or a land-

fill located upstream. Ortho-phosphate was undetected at both sites. Total phosphorus (0.03 mg/L at the reference site) increased to 0.22 mg/L at the test site (at the 62nd percentile compared with other Florida streams). In contrast, total phosphorus was undetected in the effluent.

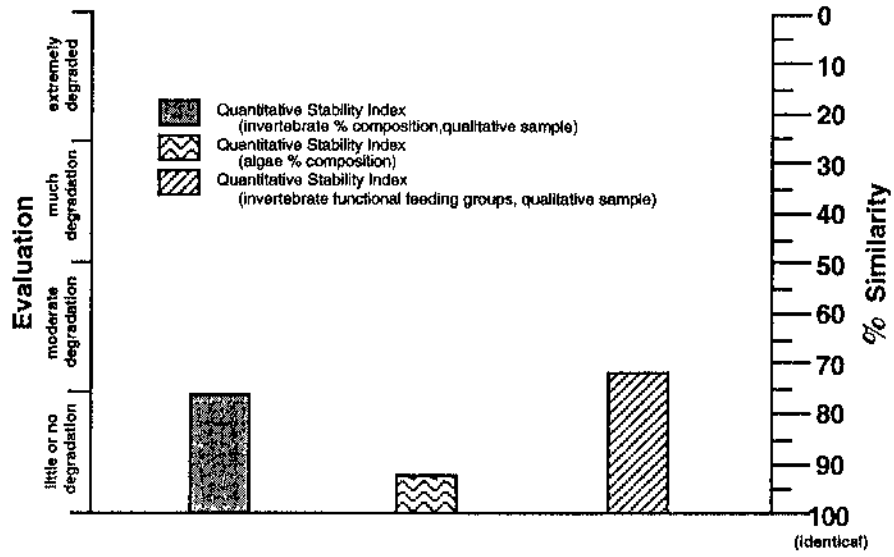
Algal growth potential decreased from 4.6 mg dry wt/L at the reference site to 3.9 mg dry wt/L at the test site. AGP of the effluent was 2.2 mg dry wt/L. All the samples were below the 5 mg algal dry wt/L "problem threshold" (Raschke and Schultz 1987). These AGP results must be viewed with caution, because a major algal bloom (discussed below) was occurring at these stations. It is possible that some sort of growth inhibition decreased the AGP results.

Measures of macroinvertebrate health indicated that both sites studied were moderately impaired, but that the facility was not responsible for any increased adverse effects. Although data from the Hester-Dendy samplers is generally emphasized in stream bioassessments, the unusually poor colonization of the samplers (only one organism found) suggested that they were disturbed during the incubation period. Dip net data will therefore be used for this assessment. The figure on p. 3 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 site. The relative abundance of each individual taxon appears in the Appendix. The figure on this page summarizes similarities between the sites. Smaller similarities (lower percentages) generally correspond with greater degradation.

Dip net sampling indicated that taxa richness was moderately low (less than 80% of all other Florida streams) at both stations, with 18 taxa at the reference site and 17 taxa at the test site. Both sites had Florida Index and EPT scores of 0, suggesting very stressed conditions. Dominant taxa at the reference site included the odonate, *Erythemis simplicicollis*, the amphipod, *Hyalella azteca*, the gastropod, *Pseudosuccinea columella*, and an undetermined culicid. The most abundant taxa found at the test site included the odonate, *Nehalennia integricallis*, the gastropods, *Micromenetus dilatatus* and *Pseudosuccinea columella*, and the dipterans, *Goeldichironomus holoprasinus*, *Polypedilum convictum* grp., and *Tanytarsus* sp. F Epler. Neither assemblage of organisms was indicative of very healthy conditions.

The Stream Invertebrate Index for Florida (SIIF) results were consistent with the above findings. The reference site received a SIIF score of 21 (moderate impairment) while the test site received 23 SIIF points (also indicative of moderate degradation). The similarity in SIIF scores between the two sites suggests that the discharge is having no additional adverse effects upon the receiving water biota, which were already moderately impaired due to non-point sources (landfill and agriculture). The stress seen in the receiving waters was probably associated with the low dissolved oxygen and elevated conductivity measured at both sites.

Phytoplankton is generally not the target population for determining pollution effects in flowing waters. In this study, however, low water velocity and high nutrients allowed for the establishment of extremely high phytoplankton biomass (chloro-



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

phyll *a*) at both receiving water stations. This phytoplankton probably inhibited the periphyton community via shading. Therefore, the phytoplankton data will be emphasized in this report. The extremely high chlorophyll *a* at both sites (314.3 µg/L and 290.4 µg/L for the reference and test sites, respectively) clearly indicated a major phytoplankton bloom was occurring. These chlorophyll *a* values are approximately six times higher than the upper 95th percentile of the chlorophyll *a* found in other Florida streams.

Most measures of the phytoplankton communities indicated very little difference between the two sites. Twenty-two taxa were collected from the reference site, while 23 were found at the test site. The percent contribution of the dominant taxon was 38.3% at the reference site (consisting of *Melosira* sp.) and 39.5% at the test site (with *Nitzschia* sp. being most numerous). These taxa are often associated with eutrophic conditions. Both sites were represented by chlorophytes, chrysophytes, euglenophytes, blue-green algae, and diatoms, with the diatom fraction most abundant. The diatom to blue-green algae ratio decreased only very slightly (4.7%) from the reference site to the test site. The QSI for algal percent composition, at 92.1%, indicates a high degree of similarity between the two sites. Therefore, although the phytoplankton communities were stressed at both stations, the facility did not appear to be responsible.

As suggested earlier, periphyton community densities were very low at both sites. Periphyton taxa richness decreased from 29 taxa at the reference site to 26 taxa at the test site. The percent contribution of the dominant taxon increased from 25.8% at the reference site to 32.7% at the test site. The periphyton diatom/blue-green ratio was very similar at both sites (slightly above 0.80).

Conclusions

Dissolved oxygen was very low at the reference site (2.4 mg/L), while it was somewhat higher (3.7 mg/L) at the test site. Dissolved oxygen at both sites was below Class III water quality standards (Rule 17-302.510(3)(g) FAC).

The effluent sample was not toxic to the water flea, *Ceriodaphnia dubia*, or to the fish, *Cyprinella leedsi*, exposed to the full strength sample.

No organic pollutants or metals were detected in the discharge at levels above quantitation limits.

Elevated nutrients were detected in the receiving waters, but non-point sources, not the facility, appeared to be responsible for the enrichment.

Algal growth potential was below the 5 mg algal dry wt/L "problem threshold" at both sites. However, these AGP results must be viewed with caution, because a major algal bloom was occurring at these stations. It is possible that some sort of growth inhibition decreased the AGP results.

Measures of macroinvertebrate health indicated that both receiving water sites were impaired. Depressed taxa richness, very low Florida Index scores (0), and Stream Invertebrate Index for Florida (SIIF) scores in the moderately impaired range were found at both the reference and test sites. The similarity in invertebrate populations between the two sites suggests that the discharge is having no additional adverse effects upon the receiving water biota, which were already moderately impaired due to non-point sources (landfill and agriculture). The stress seen in the receiving waters was probably associated with the low dissolved oxygen and elevated conductivity measured at both sites.

The extremely high chlorophyll *a* at both sites (314.3 µg/L and 290.4 µg/L for the reference and test sites, respectively) clearly indicated that a major phytoplankton bloom was occurring. These chlorophyll *a* values are approximately six times higher than the upper 95th percentile of the chlorophyll *a* found in other Florida streams. Measures of the phytoplankton communities indicated very little difference between the two sites, both of which were typical of eutrophic conditions. Therefore, although the phytoplankton communities were stressed at both stations, the facility did not appear to be responsible.

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Chemistry summary table for Ocean Spray

	Effluent	Control Site	Test Site
Organic Constituents (µg/L)			
Chloroform	0.58 I		
Metals (µg/L)			
Aluminum	100 U		
Arsenic	20 U		
Cadmium	0.08 U		
Copper	5 U		
Chromium	10 U		
Iron	31 U		
Lead	15 U		
Mercury	0.20 U		
Selenium	30 U		
Nickel	5 U		
Silver	0.05 U		
Zinc	5 U		
Nutrients (mg/L)			
Ortho-phosphate	0.02 U	0.04 I	0.02 I
Total phosphorus	0.03 I	.03	0.22
Ammonia	0.10	0.09	0.27
Nitrate+Nitrite	0.03 I	2.4	0.07
TKN	0.62	0.02 U	2.6
Other Parameters			
Habitat Assessment		48	48
D.O. (mg/L)	5.2	2.4	3.7
pH (SU's)	7.4	7.2	7.4
Conductivity (µmhos/cm)	2600	2370	2590
Hardness (mg/L as CaCo3)	428.84		
Temperature (°C)	13.4	12.3	13.5
AGP (mg dry wt/L)	2.2	4.6	3.9
Bioassay Fish	not toxic		
Bioassay Invertebrate	not toxic		
TSS (mgL)	0.7	13.2	4.9
B O D (mg/L)	0.2	4.3	2.4

I - Value reported is less than the minimum quantitation limit and greater than or equal to the minimum detection limit

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%
STREAMS (1617 stations)											
Phytoplankton Chlorophyll *a*	0.22	0.52	0.94	1.60	3.02	4.63	6.72	9.87	14.68	27.35	48.70
Periphyton Chlorophyll *a*	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
NO2-NO3	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 Phosphorus	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 *a*	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
NH3+NH4	0.01	0.02	0.02	0.03	0.04	0.06	0.08	0.12	0.15	0.21	0.28
NO2-NO3	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-Phosphorus	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 *a*	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
NH3+NH4	0.01	0.02	0.03	0.04	0.05	0.06	0.08	0.09	0.13	0.22	0.28
NO2-NO3	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-Phosphorus	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^2), Nutrients (mg/L), Turbidity (NTU), Taxa richness and diversity values are for macroinvertebrates

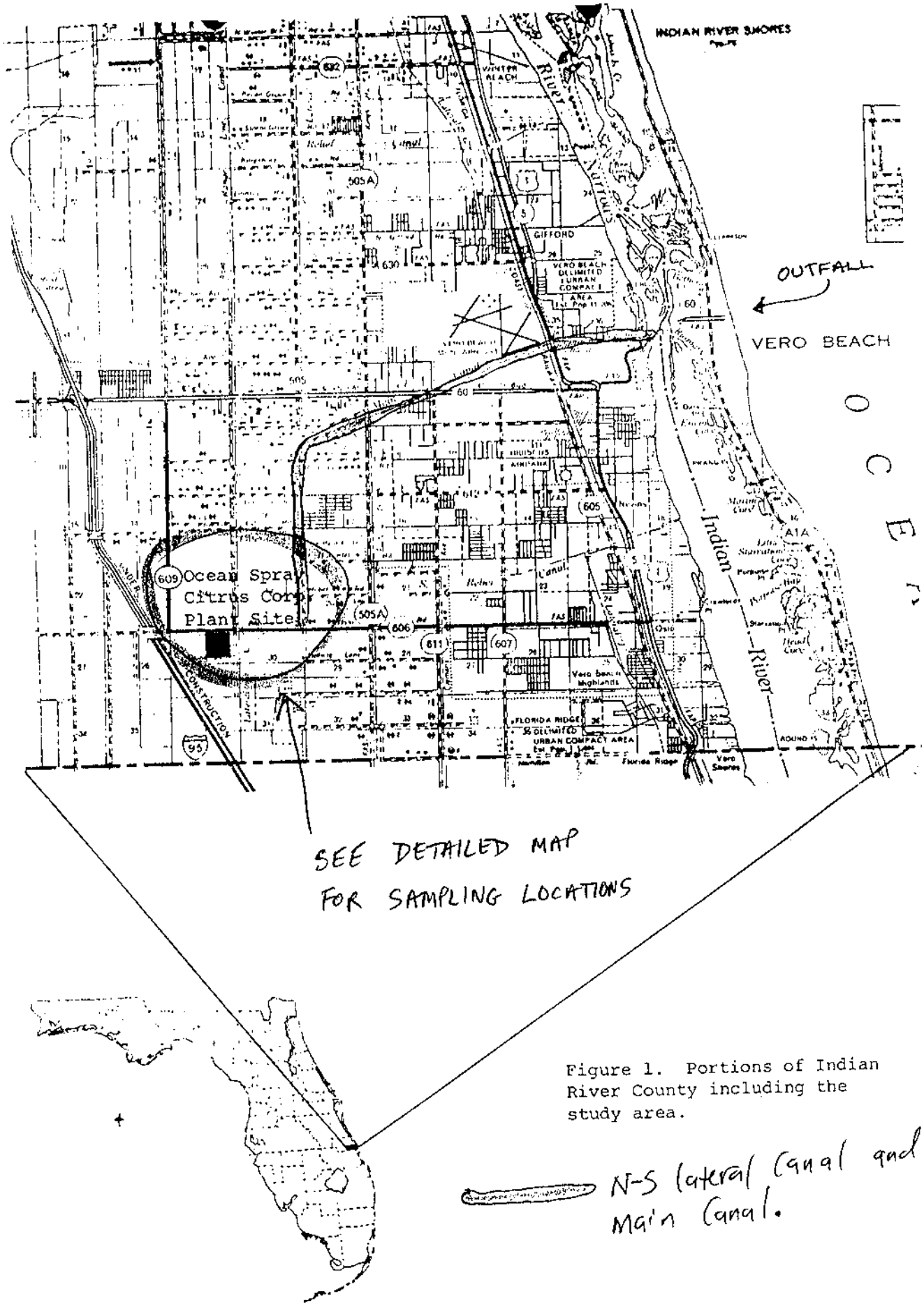
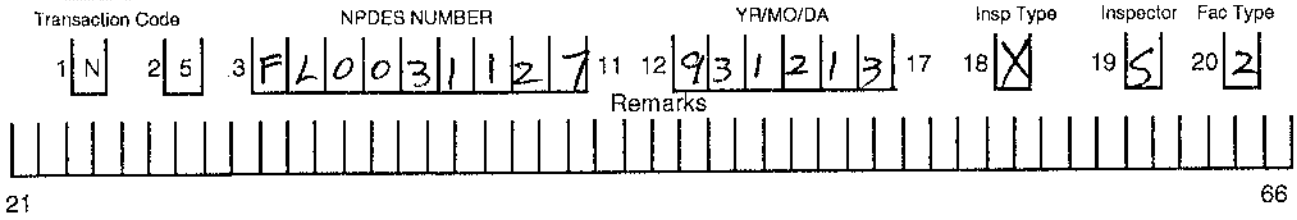
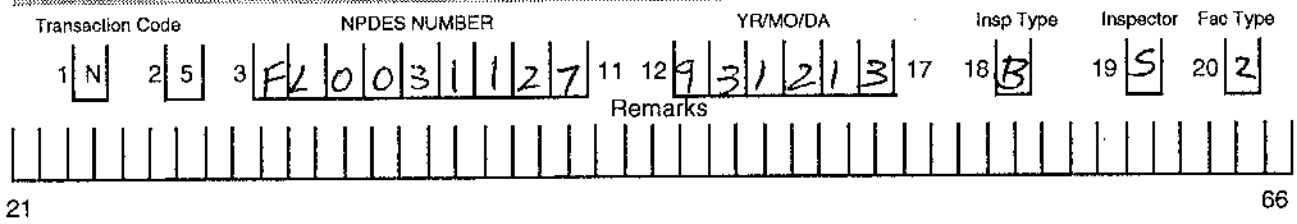


Figure 1. Portions of Indian River County including the study area.

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



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



Benthic macroinvertebrate taxa list for Ocean Spray, collected via Hester-Dendy artificial substrates in an Indian River Farms drainage canal, on 13 December, 1993. Densities, in number/m^2 represent the mean of three replicates.

	Reference Site	Test Site
Diptera		
Goeldichironomus holoprasinus	–	5

Ischnura posita	14	14
Ischnura sp.	28	–
Nehalennia integricallis	56	112
Pelecypoda		
Sphaerium or *Musculium* sp.	–	14

Benthic macroinvertebrate taxa list for Ocean Spray , collected via 20 discrete dip net sweeps in Indian River Farms drainage canal, on 13 December, 1993.

	Reference Site	Test Site
Amphipoda		
Hyalella azteca	280	–
Coleoptera		
Cybister sp.	28	–
Peltodytes sexmaculata	14	–
Peltodytes sp.	14	–
Suphisellus sp.	–	14
Undetermined Curculionidae	–	14
Decapoda		
Procambarus sp.	–	14
Diptera		
Goeldichironomus holoprasinus	14	28
Polypedilum convictum grp.	84	28
Polypedilum trigonus	14	–
Stratiomys sp.	14	–
Tanytarsus sp. F Epler	–	28
Undetermined Culicidae.	238	–
Gastropoda		
Ferrissia sp.	–	14
Littoridinops sp.	28	–
Micromenetus dilatatus	–	112
Planorbella sp.	–	28
Pseudosuccinea columella	266	42
Spilochlamys conica	–	28
Hemiptera		
Pelocoris sp.	28	–
Undetermined Hemiptera	–	14
Lepidoptera		
Munroessa sp.	14	–
Undetermined Pyralidae	70	14
Odonata		
Enallagma cardenium	14	–
Erythrodiplax connata minuscula	14	14
Erythemis simplicicollis	322	–

Oscillatoria sp.	5	157
Euglenophyta		
Phacus sp.	3	–
Trachelomonas sp.	3	–

Phytoplankton taxa list and densities (#/mL) for Ocean Spray , collected via subsurface grabs in an Indian River Farms drainage ditch, on 13 December, 1993.

	Reference Site	Test Site
Bacillariophyta		
Achnanthes sp.	–	11
Amphora sp.	–	6
Bacillaria sp.	–	6
Cymbella sp.	–	6
Gomphonema sp.	3	–
Gyrosigma sp.	6	–
Melosira sp.	–	606
Navicula spp	53	84
Nitzschia gracilis	6	17
Nitzschia longissima	73	107
Nitzschia spp.	211	247
Pinnularia sp.	6	–
Rhizosolenia sp.	–	6
Synedra sp.	2	107
Unidentified centric diatom	17	–
Chlorophyta		
Ankistrodesmus sp.	–	17
Botryococcus sp.	–	6
Crucigenia sp.	–	6
Dunaliella sp.	3	11
Gloeocystis sp.	3	–
Oocystis sp.	6	–
Stigeocolonium sp.	3	–
Unknown chlorophyte flagellate	4	11
Unknown chlorophyte sp.	5	–
Chrysophyta		
Mallomonas sp.	3	–
Cyanophyta		
Anabaena sp.	3	–
Aphanocapsa sp.	–	6
Aphanothece sp.	–	45
Chroococcus sp.	–	11
Dactylococcopsis sp.	6	–
Gloeocapsa sp.	–	22
Gloeothece sp.	4	34
Lyngbya sp.	–	6
Merismopedia sp.	6	–

Aphanothece sp.	–	1
Chroococcus sp.	4	3
Gloeocapsa sp.	1	–
Lyngbya sp.	2	1
Microcystis sp.	1	1
Oscillatoria sp.	1	–
Euglenophyta		
Phacus sp.	1	1

Periphyton taxa list and densities (#/mm$^{2)}$ for Ocean Spray , collected via glass microscope slides in an Indian River Farms drainage canal, on 13 December, 1993.

	Reference Site	Test Site
Bacillariophyta		
Achnanthes exigua	1	–
Achnanthes hungarica	1	–
Achnanthes lanceolata	1	1
Bacillaria paxillifer	2	18
Cocconeis placentula	1	–
Cyclotella meneghiniana	1	1
Epithemia sp.	1	–
Eunotia sp.	5	–
Gomphonema gracile	1	1
Gomphonema parvulum	–	1
Hantzschia amphioxys	–	1
Navicula cryptocephala	1	–
Navicula exigua	1	13
Navicula hungarica	–	1
Navicula rhynchocephala	–	1
Nitzschia amphibia	1	1
Nitzschia linearis	–	63
Nitzschia longissima	–	28
Nitzschia palea	1	42
Pinnularia cuneicephala	1	1
Pleurosigma sp.	–	1
Rhopalodia gibba	1	–
Stauroneis obtusa	1	–
Synedra ulna	–	5
Chlorophyta		
Chaetomorpha sp.	1	–
Elakatothrix sp.	1	–
Oedogonium sp.	–	1
Scenedesmus sp.	1	–
Schroederia sp.	–	3
Stichococcus sp.	1	–
Stigeocolonium sp.	1	2
Unknown chlorophyte flagellate	1	–
Chrysophyta		
Dinobryon sp.	1	2
Cyanophyta		
Anabaena sp.	1	4
Aphanocapsa sp.	–	1

FDEP Biology Section — Acute Bioassay Bench Sheet

Sample Source: OCEAN SPRAY CITRUS
Location: PROCESSING / COOLING
County: INDIAN RIVER CO / VERO BEACH
Contact/District: PHIL KANE / C.
NPDES Permit #: FL00 31127 Outfall #:

Sample Collection: Date 12-13-93 Time 10:18
Test Beginning: Date 12-14-93 Time 15:00
Test Ending: Date 12-16-93 Time 15:00
Organism Batch #: 52 Diluent Batch #: well water
Organism Age: 11 days
Test Organism: Cyprinella leedsi

67253 93-DEC-14-13

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

Test Number: 2 of 2

Remarks:

Instrument Calibrations:

	pH	Temperature °C	D.O. mg/L	Conductivity µmhos/cm
meter #	7851	90H018262	90H018262	G9005749
0 hr	7.0 @ 7.0 9.0 @ 9.0	21.7 @ 21.7	8.6 @ 22.8	933 @ 1,000 9100 @ 10,000 @ 23.1 °C
24 hr	7.0 @ 7.0 9.0 @ 9.0	21.0 @ 21.1	8.6 @ 22.3	940 @ 1,000 9100 @ 10,000 @ 23.1 °C
48 hr	7.0 @ 7.0 9.0 @ 9.0	21.8 @ 21.7	8.6 @ 22.8	963 @ 1,000 9230 @ 10,000 @ ___ °C

Conc.	Chamber #	Number Live 0 hr	Number Live 24 h	Number Live 48 h	pH 0 hr	pH 24 h	pH 48 h	Temperature (°C) 0 hr	Temperature (°C) 24 h	Temperature (°C) 48 h	D.O. (mg/L) 0 hr	D.O. (mg/L) 24 h	D.O. (mg/L) 48 h	UNCORRECTED Cond. (mmhos/cm) Cond. (µmhos/cm) 0 hr	24 h	48 h
control	65	5	5	5	7.8	7.9	8.3	22.3	22.3	22.1	8.3	8.3	9.1	~~170~~	250	235
control	86	5	5	5	7.8	7.9	8.3			22.1	8.3	8.4	9.3	240	250	235
100%	20	5	5	5	7.4	7.8	8.2	23.6	22.4	22.1	6.4	7.3	9.4	~~2310~~	2400	2380
100%	163	5	5	5	7.4	7.8	8.2			22.0	6.3	7.4	9.5	2520	2380	2360
											Jars		65	240		
													86	240		
													20	2500		
													163	2510		
														had recorded the C. dubia #5 above first KP 12/14/93		
Measured/Loaded by:		MF	TR	MF	MF	KP	MF	MF	KP	MF	MF	KP	MF	MF	KP	MF
Recorded by:		MF	TR	MF	KP	TR	TR	KP	TR	TR	KP	TR	TR	KP	TR	TR

Investigators' Signatures

Kim Pearce
Mark Whitehead
Robin C. Rader

Reviewer

	Salt Water/ Well Water	Water Quality Parameters: 20% Min Water	Sample	Method	Measured by
Field Total Residual Cl2:			not measured		
Lab Total Residual Cl2:	<0.03	<0.03	<0.03	DR100	TR
Alkalinity:	125	75	150	Hach	TR
Hardness:	120	80	125	Hach	TR
Total Ammonia:	<0.017	<0.017	<0.017	Orion	MF

Ammonia Meter #98136 Ammonia Meter Slope: -58.8 Ammonia Blank: <0.017 Control Salinity: 0 ppt Sample Salinity: 0 ppt

form updated 7/8/93

FDEP Biology Section — Acute Bioassay Bench Sheet

Sample Source: OCEAN SPRAY CITRUS PRO
Location: PROCESSING/COOLING
County: INDIAN RIVER CO / VERO BEACH
Contact/District: PHIL KANE / C
NPDES Permit #: FL00 31127 Outfall #:

Sample Collection: Date 12-13-93 Time 10:18
Test Beginning: Date 12-14-93 Time 15:00
Test Ending: Date 12-16-93 Time 15:00
Organism Batch #: 122 Diluent Batch #: 33
Organism Age: <24hrs
Test Organism: Ceriodaphnia dubia

67253 93-DEC-14-13

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

Test Number: 1 of 2

Remarks:

Instrument Calibrations:

	pH	Temperature °C	D.O. mg/L	Conductivity µmhos/cm
meter #	7851	90H018262	90H018262	G9005749
0 hr	7.0@7.0 9.0@9.0	21.7@21.7	8.6@22.8	933@1,000 9100@10,000@23.1 °C
24 hr	7.0@7.0 9.0@9.0	21.0@21.1	8.6@22.3	940@1,000 9100@10,000@23.1 °C
48 hr	7.0@7.0 9.0@9.0	21.8@@21.7	8.6@22.8	963@1,000 9230@10,000@23.0 °C

Conc.	Chamber #	Number Live 0 hr	Number Live 24 h	Number Live 48 h	pH 0 hr	pH 24 h	pH 48 h	Temperature (°C) 0 hr	Temperature (°C) 24 h	Temperature (°C) 48 h	D.O. (mg/L) 0 hr	D.O. (mg/L) 24 h	D.O. (mg/L) 48 h	UNCORRECTED Cond. (mmhos/cm) Cond. (µmhos/cm) 0 hr	UNCORRECTED 24 h	UNCORRECTED 48 h
control	A	5	5	5	8.2		8.2	22.1		23.0	8.2		8.5	170		185
control	B	5	5	5			8.2						8.5			185
control	C	5	5	5			8.2						8.4			185
control	D	5	5	5			8.2						8.5			195
100%	A	5	5	5	7.5		8.6	22.5		22.5	7.1		8.5	2310		2850
100%	B	5	5	5			8.6						8.5			2400
100%	C	5	5	5			8.6						8.5			3030
100%	D	5	5	5			8.6						8.5			3100
Measured/Loaded by:		MF	TR	MF	MF		MF	MF		MF	MF		MF	MF		MF
Recorded by:		MF	TR	MF	KP		TR	KP		TR	KP		TR	KP		TR

Investigators' Signatures

A. Kim Pearce
Marbell Fardette
Tobin C. Rodan

Reviewer

	Salt Water/ Well Water	Water Quality Parameters 20% Min Water	Sample	Method	Measured by
Field Total Residual Cl2:			not	measured	
Lab Total Residual Cl2:	<0.03	<0.03	<0.03	DR 100	KP
Alkalinity:	125	75	150	Hach	TR
Hardness:	120	80	125	Hach	TR
Total Ammonia:	<0.017	<0.017	<0.017	Orion	MF

Ammonia Meter #98136 Ammonia Meter Slope: -58.8 Ammonia Blank: <0.017 Control Salinity: 0 ppt Sample Salinity: 0 ppt

form updated 7/8/93

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

PHYSICAL/CHEMICAL CHARACTERIZATION FIELD DATA SHEET (Version 4)

SUBMITTING AGENCY CODE: 30 / SUBMITTING AGENCY NAME: FDEP CENTRAL DISTRICT	STORET STATION NUMBER:	DATE (M/D/Y): 12/13/93	TIME: 1055	RECEIVING BODY OF WATER: INDIAN RIVER LAGOON CANAL TO

REMARKS: DOWNSTREAM	LOCATION: OCEAN SPRAY CITRUS VERO BEACH, FL	FIELD ID/NAME: OCEAN SC

RIPARIAN ZONE/INSTREAM FEATURES

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

Forest	Field/Pasture	Agricultural	Residential	Commercial	Industrial	Other (Specify)
		25			25	50% Landfill

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): outfall from ocean spray citrus.

Estimated System Width (range, m): 340	Estimated System Depth (range, m): 0.50	yes
High Water Mark (m above bed): 0.75	Velocity (range, m/s): L 0.25	Impounded ☐ Channelized ☑

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)	5	1	NET	Riffles	0		NET
Leaf Packs	5	1	"	Sand	10	2	"
Aquatic Vegetation	25-60	12	"	Mud/Muck/Silt	CS ED		
Rock or Shell Rubble	0			Benthic leaf mats	10	2	"
Undercut Banks/Roots	10	2	"	Other:			

WATER QUALITY

	Depth (m):	Temp. (°C):	pH (SU):	D.O. (mg/l):	Cond. (µmho/cm):			Secchi (m):
Top								
Mid-depth	0.25	13.45	7.41	3.69	25.90			n/a
Bottom								TO Bottom

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

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

Water Surface Oils (check box): None: ☑ Sheen: ☐ Globs: ☐ Slick: ☐ very slight in some areas

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

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

Weather Conditions: P. cloudy 70° F

Abundance:	Absent	Rare	Common	Abundant
Periphyton	☐	☒ CS	☑	☐
Fish	☒ CS	☐	☐	☑
Aquatic Macrophytes	☐	☐	☐	☑
Iron/sulfur Bacteria	☑	☐	☐	☐

SAMPLING TEAM:	SIGNATURE:	DATE:
KANE, ~~KENT SMITH~~ CS	Phil Kane	12/13/93

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

SUBMITTING AGENCY CODE: 30 / SUBMITTING AGENCY NAME: FDEP CENTRAL DISTRICT	STORET STATION NUMBER:	DATE (M/D/Y): 12/13/93	RECEIVING BODY OF WATER: INDIAN RIVER CANAL TO Lagoon

REMARKS:	LOCATION: OCEAN SPRAY CITRUS VERO BEACH, FL.	FIELD ID/NAME:
DOWNSTREAM		OCEAN SC

Habitat Parameter / score	Excellent	Good	Fair	Poor
Bottom Substrate/ Available Cover: 28	Greater than 40% snags, logs, tree roots, emergent vegetation, leaf packs, undercut banks, rubble, or other stable habitat. **23-30 points**	20% to 40% snags, logs, tree roots, emergent vegetation, leaf packs, etc. Adequate habitat. **16-22 points**	5% to 20% snags, logs, tree roots, emergent vegetation, leaf packs, etc. Less than desirable habitat. **8-15 points**	Less than 5% snags, logs, tree roots, emergent vegetation, leaf packs, etc. Lack of habitat is obvious. **0-7 points**
Water Velocity: 1	Max. observed: >0.3 m/sec. but < 1 m/sec **23-30 points**	Max. observed; 0.1 to 0.3 m/sec **16-22 points**	Max. observed; 0.05 to 0.1 m/sec **8-15 points**	Max. observed; <0.05 m/sec, or spate occurring; > 2 m/sec **0-7 points**
Artificial Channel/ Flow Alteration: 2	No artificial channelization. Little activity (impervious surface) in watershed which would cause scouring during spates. **12-15 points**	—	—	Artificially channelized, or scouring present during spates because of excess impervious surface in watershed. **0-3 points**
Bank Stability: 8	Stable. No evidence of erosion or bank failure. Little potential for future problems. **9-10 points**	Moderately stable. Infrequent or small areas of erosion, mostly healed over. **6-8 points**	Moderately unstable. Moderate areas of erosion, high erosion potential during floods. **3-5 points**	Unstable. Many raw, eroded areas. Obvious bank sloughing. **0-2 points**
Riparian Zone Vegetation Quality: 7	Over 80% of streambank surfaces consist of native plants, classified as: bottomland hardwoods, understory shrubs, or non-woody macrophytes. **9-10 points**	50% to 80% of riparian zone is vegetated, but one class of plants is not represented. **6-8 points**	25% to 50% of riparian zone is vegetated, but one or two classes of plants are not represented. **3-5 points**	Less than 25% of streambank surfaces are vegetated. Poor plant community (e.g. grass monoculture) present. **0-2 points**

Adjustments: +4	Add 5 points if cross-sectional area of flow is estimated to be greater than one square meter during periods of normal flow.	TOTAL SCORE: 48

COMMENTS:

ANALYSIS DATE:	ANALYST:	SIGNATURE:
12/13/93	PHIL KANE	Phil Kane

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

PHYSICAL/CHEMICAL CHARACTERIZATION FIELD DATA SHEET (Version 4)

SUBMITTING AGENCY CODE: 30 / SUBMITTING AGENCY NAME: FDEP CENTRAL DISTRICT	STORET STATION NUMBER:	DATE (M/D/Y): 12/13/93	TIME 11:45	RECEIVING BODY OF WATER: INDIAN CANAL TO RIVER LAGOON

REMARKS: UPSTREAM	LOCATION: OCEAN SPRAY CITRUS VERO BEACH, FL	FIELD ID/NAME: OCEAN SC

RIPARIAN ZONE/INSTREAM FEATURES

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

Forest	Field/Pasture	Agricultural	Residential	Commercial	Industrial	Other (Specify)
		25			25	Landfill 50%

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): none OKES

Estimated System Width (range, m): 3.0	Estimated System Depth (range, m): 0.50	yes
High Water Mark (m above bed): 0.75	Velocity (range, m/s): < 0.25	Impounded ☐ Channelized ☑

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)	5	1	NET	Riffles	0		NET
Leaf Packs	5	1	"	Sand	10	2	"
Aquatic Vegetation	60	12	"	Mud/Muck/Silt	0		
Rock or Shell Rubble	0			Benthic leaf mats	10	2	"
Undercut Banks/Roots	10	2	"	Other:			

WATER QUALITY

	Depth (m):	Temp. (°C):	pH (SU):	D.O. (mg/l):	Cond. (µmho/cm):			Secchi (m):
Top								
Mid-depth	0.25	12.2 C	7.22	2.36	2370			X To Bottom
Bottom								

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

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

Water Surface Oils (check box): None: ☑ Sheen: ☐ Globs: ☐ Slick: ☐

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

Color (check box): Tannic: ☑ Green (algae): ☐ Clear: ☐ Other: ☐ _____

Weather Conditions: P. cloudy 70's

Abundance:	Absent	Rare	Common	Abundant
Periphyton	☐	☐	☑	☐
Fish	☐	☐	☐	☑
Aquatic Macrophytes	☐	☐	☐	☑
Iron/sulfur Bacteria	☑	☐	☐	☐

SAMPLING TEAM: KANE, ~~KENT~~ Smith CS	SIGNATURE: Phil Kane	DATE: 12/13/93

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

SUBMITTING AGENCY CODE: 30 / SUBMITTING AGENCY NAME: FDEP CENTRAL DISTRICT	STORET STATION NUMBER:	DATE (M/DY): 12/13/93	RECEIVING BODY OF WATER: INDIAN RIVER CANAL TO LAGOON

REMARKS:	LOCATION: OCEAN SPRAY CITRUS VERO BEACH, FL.	FIELD ID/NAME: OCEAN SC
UPSTREAM		

Habitat Parameter / score	Excellent	Good	Fair	Poor
Bottom Substrate/ Available Cover — 28	Greater than 40% snags, logs, tree roots, emergent vegetation, leaf packs, undercut banks, rubble, or other stable habitat. **23-30 points**	20% to 40% snags, logs, tree roots, emergent vegetation, leaf packs, etc. Adequate habitat. **16-22 points**	5% to 20% snags, logs, tree roots, emergent vegetation, leaf packs, etc. Less than desirable habitat. **8-15 points**	Less than 5% snags, logs, tree roots, emergent vegetation, leaf packs, etc. Lack of habitat is obvious. **0-7 points**
Water Velocity — 1	Max. observed: >0.3 m/sec. but < 1 m/sec **23-30 points**	Max. observed; 0.1 to 0.3 m/sec **16-22 points**	Max. observed; 0.05 to 0.1 m/sec **8-15 points**	Max. observed; <0.05 m/sec, or spate occurring; > 2 m/sec **0-7 points**
Artificial Channel/ Flow Alteration — 2	No artificial channelization. Little activity (impervious surface) in watershed which would cause scouring during spates. **12-15 points**	—	—	Artificially channelized, or scouring present during spates because of excess impervious surface in watershed. **0-3 points**
Bank Stability — 8	Stable. No evidence of erosion or bank failure. Little potential for future problems. **9-10 points**	Moderately stable. Infrequent or small areas of erosion, mostly healed over. **6-8 points**	Moderately unstable. Moderate areas of erosion, high erosion potential during floods. **3-5 points**	Unstable. Many raw, eroded areas. Obvious bank sloughing. **0-2 points**
Riparian Zone Vegetation Quality — 9	Over 80% of streambank surfaces consist of native plants, classified as: bottomland hardwoods, understory shrubs, or non-woody macrophytes. **9-10 points**	50% to 80% of riparian zone is vegetated, but one class of plants is not represented. **6-8 points**	25% to 50% of riparian zone is vegetated, but one or two classes of plants are not represented. **3-5 points**	Less than 25% of streambank surfaces are vegetated. Poor plant community (e.g. grass monoculture) present. **0-2 points**

Adjustments — N/A	Add 5 points if cross-sectional area of flow is estimated to be greater than one square meter during periods of normal flow.	TOTAL SCORE — 48

COMMENTS:

ANALYSIS DATE: 12/13/93	ANALYST: PHIL KANE	SIGNATURE: Phil Kane

OCEAN SPRAY
(Facility)

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION
FACILITY SUMMARY

Description of permitted outfall(s):

OSN 001 (NPDES) 0.09 MGD (ADF) Seasonal, discharge non-contact refrigerant cooling H_2O, water softener Backflush, excess well H_2O and area Stormwater (plant runoff)

OSW 002 (Strong waste) Fruit wash, TASTE Evaporator condensate, plant cleanup (0.10 MGD max) Flow to inject. well of 75 acre Sprayfield.

List permit violations (from MOR data or other source) and plant upsets that occurred within past year:

- None
- No plant upsets Reported within past year.

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

ONE BIOASSAY done by DER on 4-13-81
Results concluded that 001 effluent was nontoxic to Daphnia pulex, Simocephalus Serrulatus, or Heterandria formosa.

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

No Significant change in effluent quality within the last year. However, effluent quality is much better than in 1981.

Additional information:

★ Important NOTE:
A County landfill is located along the E-W lateral canal upstream from 001 outfall. (See Attached Diagram)

Staff contributing to this review (signature):

Philip N. Kane, Ed.D.	(Biologist)
Clayton J. Smith	(Inspector)
noted, E. Elliott	(Engineer)
	( )
	( )
	( )

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION
FACILITY SUMMARY

Facility Name: OCEAN SPRAY Cranberries, Inc		Date Summary Prepared: 11-18-93
Location (attach detailed map): - Attached -	County: INDIAN RIVER	District: 30
Federal Permit # FL0031127 and expiration date: 7-31-95	State GMS # and 3031P05351 State expiration date: 6-1-94	Facility Type: 2 (Industrial) Municipal Federal Agricultural Other (list):

Function of facility:
Process single strenth citrus Juice to Concentrate.

Description of treatment process:
Waste water Consists of the following Sources:
1. Refrigerant Cooling H_2O
2. water softener Back Flush H_2O.
3. Plant Runoff.

Receiving waters: Indian River	Classification: I II (III)	
Design Flow: 0.09 MGD	Mean Flow: 0.036 - 0.065 MGD	Flow during survey: 0.036 MGD (*)

Discharge is: Continuous Intermittent (Seasonal) (Rainfall dependent)
Other (describe)

therefore, the best time to sample is: Late December through April.

If facility has a mixing zone, give details (size, parameters affected, etc.):
No Mixing Zone.

List effluent limits (if necessary, attach relevant paperwork):

Parameter	Limit (units)
PH	6.0 - 8.5
Flow	0.09 MGD
BOD_5	10 mg/L
Cr_6	0.5 mg/L
Cl	0.01 mg/L
Zn	0.5 mg/L
Temp	95°F
Na	None

Describe special permit conditions and permit modifications:
None

(*) Flow Reported 12-92. For Same time period.

Facility Information Sheet
to provide information in writing bioassay reports

Facility Name: OCEAN SPRAY CITRUS PROCESSOR

(as found on the permit)

NPDES permit #: FL00 31127

Facility Location: (road) 0510 ROAD (2 mi E. of I-95

(city) VERO BEACH (WEST)

(county) INDIAN RIVER (Class III)

Receiving Water: Indian River

Chlorination Type of Sample: ___ Chlorinated
___ Sample collected after dechlorination
X Non-chlorinated

Design Flow and/or (Average Flow:) (CIRCLE ONE) 0.09 MGD (DEC → April only)

Type of Facility: Citrus Processor

Type of Treatment that Wastewater Receives Prior to Discharge:

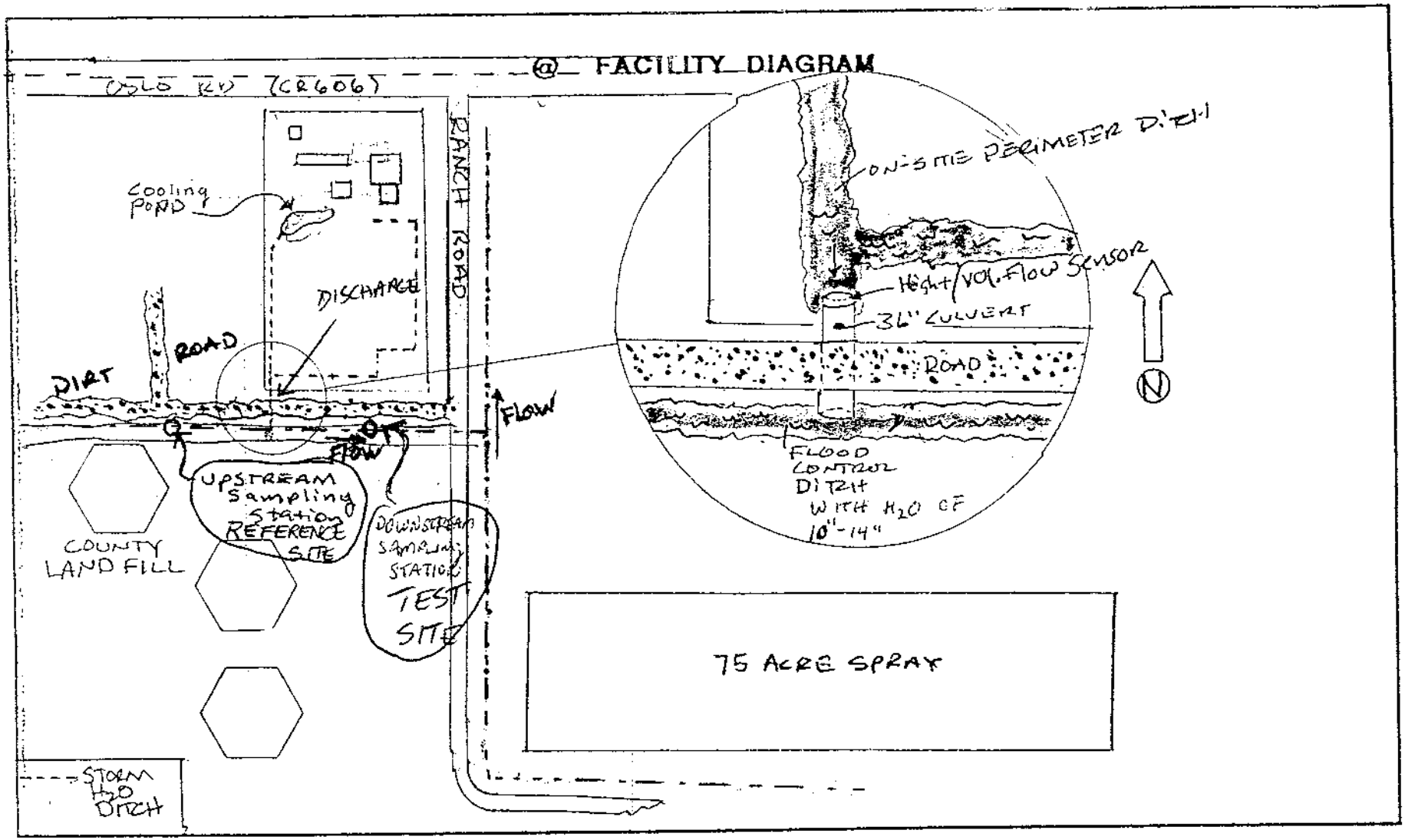
Settling and Thermal Cooling via on-site accumulation pond and Dilution via Indian River farms Drainage Canals, flows approx 3 miles through Drainage Canals before discharge to Indian River

Additional Comments:

Volume of Flow is very much rainfall dependent Due to the large surface area on site which Drains to the outfall culvert at the property Boundary.

prepared by Clayton L. Smith ES-1

@ FACILITY DIAGRAM



INSPECTION COMMENTS